

SPECIFICATIONS
FOR
OLTHOFF DRIVE
INDUSTRIAL PARK ROADWAY
EXPANSION PROJECT

CITY OF MUSKEGON
MUSKEGON, MICHIGAN

MUSKEGON



West Michigan's Shoreline City
www.shorelinecity.com

HRC JOB NO. 20210307



HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

1925 Breton Road, SE, Suite 100
Grand Rapids, Michigan 49506



TABLE OF CONTENTS

<u>NUMBER</u>	<u>SECTION NAME</u>	<u>PAGE NUMBER</u>
---------------	---------------------	--------------------

BIDDING REQUIREMENTS - CONTRACT PROVISIONS

00001	Title Page	1
00010	Table of Contents	1 thru 3
00011	List of Drawings	1 only
00030	Advertisement for Bids	1 thru 2
00120	Instructions to Bidders.....	1 thru 6
00300	Proposal and Legal Status of Bidder	1 thru 8
00310	Bid Item Description	1 thru 11
00500	Contract	1 and 2
00610	Performance Bond.....	1 and 2
00620	Labor and Material Bond	1 and 2
00630	Maintenance and Guarantee Bond	1 and 2
00700C	General Conditions-Contractor Layout	1 thru 18
00702	Enrolled House Bill No. 5541	1 thru 4
00704	Enrolled House Bill No. 1024	1 thru 4
00800	General Supplementary Conditions.....	1 thru 7

DIVISION 1 - GENERAL REQUIREMENTS

01000	General Specifications.....	1 thru 11
01005	Administrative Provisions	1 thru 5
01039	Coordination and Meetings	1 thru 4
01300	Submittals	1 thru 6
01310	Progress Schedules.....	1 and 2
01400	Quality Control.....	1 thru 3
01500	Construction Facilities.....	1 thru 6
01580	Project Signs.....	1 thru 3
01600	Material and Equipment	1 thru 6
01700	Contract Closeout	1 thru 6
01900	Soil Conditions and Boring Logs	1 only

DIVISION 2 - SITE WORK

02200	Earthwork	1 thru 9
02214	Roadway Excavation, Backfill, and Compaction.....	1 thru 3
02220	Soil Erosion Control.....	1 thru 6
02512	HMA Acceptance.....	1 and 8
02662	Watermains.....	1 thru 16
02663	Watermain and Fittings	1 thru 6
02671	Hydrant, 6 Inch, Standard.....	1 only
02735	Leaching Basin, 48 inch dia	1 thru 2
02736	Sewers	1 thru 6

<u>NUMBER</u>	<u>SECTION NAME</u>	<u>PAGE NUMBER</u>
02737	Catch Basin 4 Ft Special Detail	1 only
02738	Dr Structure Cover Modified.....	1 only
02739	Dr Structure Cover Adj Case 1 Modified.....	1 only
02990	Permits	1 only

DIVISION 3 – CONCRETE

(Not Used)

DIVISION 4 – MASONRY

(Not Used)

DIVISION 5 – METALS

(Not Used)

DIVISION 6 - WOOD AND PLASTICS

(Not Used)

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

(Not Used)

DIVISION 8 - DOORS AND WINDOWS

(Not Used)

DIVISION 9 - FINISHES

(Not Used)

DIVISION 10 -SPECIALTIES

(Not Used)

DIVISION 11 - EQUIPMENT

11510	Safety Equipment	1 thru 3
-------	------------------------	----------

DIVISION 12 - FURNISHINGS

(Not Used)

DIVISION 13 - SPECIAL CONSTRUCTION

(Not Used)

<u>NUMBER</u>	<u>SECTION NAME</u>	<u>PAGE NUMBER</u>
---------------	---------------------	--------------------

DIVISION 14 - CONVEYING SYSTEMS

(Not Used)

DIVISION 15 – MECHANICAL

(Not Used)

DIVISION 16 - ELECTRICAL

(Not Used)

END OF SECTION

SECTION 00011

LIST OF DRAWINGS

1. COVER SHEET & LOCATION MAP
2. CROSS SECTIONS
3. DETAIL SHEET
4. DETAIL SHET
5. EXISTING SITE PLAN
6. PROPOSED SITE PLAN
7. REMOVAL SHEET
8. ROAD IMPROVEMENTS – STA 34+50 TO STA 38+00
9. ROAD IMPROVEMENTS – STA 38+00 TO STA 42+00
10. ROAD IMPROVEMENTS – STA 42+00 TO STA 46+00
11. ROAD IMPROVEMENTS – STA 46+00 TO STA 51+00
12. UTILITY IMPROVEMENTS – STA 34+50 TO STA 38+00
13. UTILITY IMPROVEMENTS – STA 38+00 TO STA 42+00
14. UTILITY IMPROVEMENTS – STA 42+00 TO STA 46+00
15. UTILITY IMPROVEMENTS – STA 46+00 TO STA 51+00
16. UTILITY IMPROVEMENTS – SANITARY PIPE CONNECTION
17. CUL-DE-SAC DETAIL GRADES
18. PAVEMENT MARKING AND SIGNAGE PLAN

ADVERTISEMENT FOR BIDS
OLTHOFF DRIVE
INDUSTRIAL PARK ROADWAY EXPANSION PROJECT
MUSKEGON, MICHIGAN

Sealed proposals for the construction of the Olthoff Drive Industrial Park Roadway Expansion Project will be received by the City of Muskegon, 933 Terrace Street, Muskegon, MI 49440, until 2:00 p.m., Local Time on December 13, 2022, at which time and place all bids will be publicly opened and read.

Bidders shall review and comply with the Instructions to Bidders, which are incorporated by reference, and carefully review all Contract Documents, as defined in the Instructions to Bidders. Bids submitted after the exact time specified for, receipt will not be considered.

The Contracts will consist of the following principal items of work and appurtenances as specified herein and shown on the Contract Drawings.

Description of Work

The contract will consist of furnishing of labor, materials, equipment, and construction of the following:

1. Removal of existing Olthoff Drive cul-de-sac.
2. Full depth construction of HMA roadway, extending Olthoff Drive south, including curb and gutter, pavement markings, and curb underdrain.
3. Installation of storm drain and structures under proposed roadway.
4. Establishing a watermain connection to existing utility and installing watermain under proposed roadway to service development sites.
5. Establishing a sanitary sewer connection to existing utility and installing watermain to service development sites.
6. Restoration of the disturbed areas including placement of topsoil, seed and mulch, and replacement of items as shown on the plans.
7. Soil erosion and sedimentation control measures as required.

Bidders, subcontractors, and suppliers are encouraged to register with HRC to be notified of addenda and relevant bid information. Bids received from unregistered bidders will be rejected. Hard copy plans and specifications will be available at Muskegon City Hall for viewing only after November 22, 2022.

Questions regarding this project should be addressed to: Hubbell, Roth & Clark, Inc., 1925 Breton Road, SE, St. 100; Grand Rapids, MI 49506, via email at: rwilcox@hrcengr.com. All questions must be received by December 9, 2022.

Proposals submitted by Bidders who have been debarred, suspended, or made ineligible by any Federal Agency will be rejected.

Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

Each bid proposal shall be submitted on the proposal forms provided and shall be accompanied by a certified check, cashier's check or bid bond, executed by the bidder and Surety Company, payable to the City of Muskegon in the amount of five Percent (5%) of the accompanying bid. Proposal Guarantee shall provide assurance that

the bidder will, upon acceptance of the bid, execute the necessary Contract with the City of Muskegon. No bid may be withdrawn after scheduled closing time for receiving bids for at least ninety (90) days.

The successful bidder will be required to furnish satisfactory Performance, Labor and Material, and Maintenance and Guarantee Bonds.

The City of Muskegon reserves the right to reject all bids and to waive irregularities in bidding.

No Proposal will be received unless made on blanks furnished and delivered to the City of Muskegon Clerk on or before 2:00 p.m., Local time, December 13, 2022.

CITY OF MUSKEGON

Published in Muskegon, MI, on November 7, 2022.

SECTION 00120
INSTRUCTIONS TO BIDDERS

SCOPE OF WORK

The work under this Contract shall consist of the furnishing of all labor, material, equipment, services, and all incidental items necessary to complete the project in accordance with the Contract Documents.

OBSERVATION OF SITE

Before submitting a Proposal, each bidder shall personally inspect the site of the proposed work to arrive at a clear understanding of the conditions under which the work is to be done.

He shall be held to have compared the premises with the Drawings and Specifications and to have satisfied himself as to the conditions of the premises, existing constructions, and any other conditions affecting the carrying out of the work, before delivery of his Proposal.

No allowance or extra consideration on behalf of the Bidder will subsequently be allowed by reason of error or oversight on the part of the Bidder or on account of interferences by the Owner's or by other Bidder's activities.

SOIL CONDITIONS

The Contractor, as such and as bidder, shall make his own determination as to soil and/or rock conditions and he shall complete the work in whatever material and under whatever conditions he may encounter or create, without extra cost to the Owner. This shall apply whether or not borings are shown on the Drawings.

All bidders conducting soil tests shall restore the area of their testing to original condition as closely as possible.

The Owner does not guarantee that the ground encountered during construction will conform with any boring information furnished herein.

The Owner and Hubbell, Roth & Clark, Inc. may have been involved in the design, observation, and/or construction of other underground projects in the area of the proposed construction. The observation reports, soil reports, and any soil information connected with these projects are available for construction observation and review by the prospective bidders.

ADVERTISEMENT

The published Advertisement for the proposed work contains information necessary to bidders. A copy of the Advertisement shall be considered a part of the Instructions to Bidders as fully as if repeated herein.

PROPOSALS

Proposals will be received in accordance with the Advertisement for Bids, and shall be submitted only on forms provided by the Engineer.

Proposals shall be enclosed in sealed envelopes marked with the name of the project and bidder and shall be delivered to the designated location on or before the bid time as specified in the Advertisement for Bids.

Proposals shall be made in full conformity with all the conditions set forth in the drawings and in these specifications. Bids are firm and cannot be withdrawn for a period of 60 days after opening of the bids, unless otherwise specified in the Advertisement for Bids.

NAME AND STATUS OF BIDDER

The name and legal status of the bidder, either as a corporation, partnership, or individual, shall be stated in the Proposal.

Anyone signing a Proposal as an agent of another or others, must submit with the Proposal, legal evidence of his authority to do so.

The place of residence of each bidder, or the office address and telephone number in the case of a firm or company, with County and State, must be given after his signature.

BIDDER'S QUALIFICATIONS

It is the intention of the Owner to award this Contract to a Bidder fully capable, both financially and with regard to experience to perform and complete the work in a satisfactory manner. If required by the Owner, each bidder under consideration may be required to furnish the Owner, within 48 hours at the Owner's request, the following information sworn to under oath by him:

1. Performance record.
2. The address and description of the bidder's plant and place of business.
3. Itemized list of equipment available for use on the project.
4. A description of any similar project which the bidder has constructed in a satisfactory manner.
5. A certified or authenticated financial statement dated within sixty days prior to the opening of bids. The Owner may require that any items of such statements be further verified.
6. A list of contracts on which the bidder is currently engaged.
7. Such additional information as will satisfy the Owner that the bidder is adequately prepared, in technical experience and otherwise, to fulfill the Contract.

BID DEPOSIT

Each Proposal must be accompanied by a bid deposit in the form described in the Advertisement for Bids, Specification Section 00030, as a guarantee on the part of the bidder that he will, if called upon to do so, enter into contract in the attached form, to do the work covered by such proposal and at the price stated therein and to furnish acceptable surety for its faithful and entire fulfillment. Such certified check or bidder's bond shall be made out to the Owner and shall be subject to the conditions specified in the Proposal.

The bid deposits of all except the three lowest bidders will be returned within three days after the opening of bids. The bid deposits of the three lowest bidders will be returned within 48 hours after the Contract is awarded to the successful bidder and the signed agreement has been delivered and the required bonds have been finally approved by the Owner, or after rejection of all bids.

Surety companies providing and executing Bid Bonds shall appear on the United States Treasury Department's most current list (Circular 570) as holding certificates of authority as acceptable sureties on federal bonds. The penal sum of such bonds shall not exceed a company's underwriting limitation as stated therein. A surety company shall be licensed in the State in which it provides a bond and in the State where the Contract work is to be performed.

Failure to provide a bid bond from a qualified company shall be a basis for rejection of a bid as non-responsive and non-responsible.

EXPLANATION TO BIDDERS BY ADDENDUMS

Neither the Owner nor the Engineer will give verbal answers to inquiries, regarding the meaning of the Drawings or Specifications, or give verbal instructions, previous to the award of the Contract. Any verbal statements regarding same by any persons, previous to the award, shall be unauthoritative.

Explanations desired by bidders shall be requested of the Engineer in writing and, if explanations are necessary, a reply will be made in the form of an addendum, a copy of which will be forwarded to each bidder whose work is affected.

Addendums issued to bidders prior to date of receipt of proposals shall become a part of the Specifications, and all proposals shall include the work described in the addendums.

No inquiry received within 4 days of the date fixed for the opening of bids will be given consideration.

Failure of the Engineer to send, or of the bidder to receive, any such interpretations shall not relieve the bidder from obligation under his bid as submitted.

RIGHT TO ACCEPT, TO REJECT, AND TO WAIVE DEFECTS

The Owner reserves the right to accept any Proposal, to reject any or all Proposals, and to waive any defects or irregularity in the Proposal if it appears advantageous to the Owner to do so.

Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

TIME OF COMPLETION

The Owner and the individual citizens of the municipality affected by this project are vitally concerned with the prompt completion of the construction together with the cleanup and restoration of roads and lawns within the time allowed in the Proposal.

The Bidder shall use sufficient labor and equipment to complete and place in service all of the work being constructed within this Contract within the time specified in the Proposal. The surface cleanup shall follow closely behind construction with earth spoil removed from lawns and roads and any trenches neatly finished by the end of each work day. Failure of the Bidder to comply with this type of workmanlike job will result in the suspension of construction operations until the cleanup is effected.

If the Bidder shall be unavoidably delayed in beginning or fulfilling this Contract by reason of excessive storms or floods, or by Acts of Providence, or by strikes, or by court injunction, or by stopping of the work by the Owner because of any emergency or public necessity, or by reason of alterations ordered by the Owner, the Bidder shall have no valid claim for damages on account of any cause or delay; but he shall in such case be entitled to such an extension of the above time limit herein, as the Engineer shall adjudge to be just and reasonable; provided, however, that formal claim for such extension shall be made in writing by the Bidder within a week after the date upon which such alleged cause or delay shall have occurred.

FAIR EMPLOYMENT PRACTICES

Section 4 of the Fair Employment Practices Act PA 1955, No. 251, provides:

Section 4. Every Contract to which the State or any of its political or civil subdivisions is a party shall contain a provision requiring the Bidder and his subcontractors not to discriminate against any employee or applicant for employment, to be employed in the performance of said contract, with respect to his hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment, because of his race, color, religion, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the Contract.

Section 4A of the Act provides:

Section 4A. Every contract which the State or any of its political or civil subdivisions is a party shall contain a provision requiring the Bidder and his subcontractors not to discriminate against any employee or applicant for employment to be employed in the performance of such contract with respect to his hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of his age or sex, except where based on a bona fide occupational qualification.

END OF SECTION

PROPOSAL
FOR
OLTHOFF DRIVE INDUSTRIAL PARK ROADWAY EXPANSION PROJECT
CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

City of Muskegon
1350 East Keating Avenue
Muskegon, MI 49442

Bids Due: December 13, 2022
On or Before 2:00 pm, Local Time
HRC Job No. 20210307

To Prospective Bidders:

Name of Bidder: _____

Address: _____

Date: _____ Telephone: _____ Fax: _____

The above, as Bidder, hereby declares this bid is made in good faith without fraud or collusion with any persons bidding, and that the Drawings, Specifications, and all other information referenced in the Instructions to Bidders have been examined. Further, the Bidder is familiar with the location of the work described herein and is fully informed as to the nature of the work and the conditions relating to the performance of the Contract.

The Bidder acknowledges that no representations or warranties of any nature whatsoever have been received, or are relied upon from the City of Muskegon, its agents or employees, as to any conditions to be encountered in accomplishing the work and that the bid is based solely upon the Bidder's own independent judgment.

The above, as Bidder, hereby certifies that the Drawings, Specifications, and other data provided by the Owner for bidding purposes have been examined. Further, the undersigned certifies that the proposed construction methods have been reviewed and found acceptable for the conditions which can be anticipated from the information provided for bidding.

The Bidder hereby affirms that the site of work has been inspected and further declares that no charges in addition to the Individual Unit Prices shall be made on account of any job circumstances or field conditions which were present and/or ascertainable prior to the bidding. In addition, The Contractor, as such and as Bidder, shall make the determination as to existing soil conditions and shall also complete the work under whatever conditions created by the Contractor/Bidder's sequence of construction, construction methods, or other conditions the Contractor/Bidder may create, at no additional cost to the Owner.

The above, as Bidder, confirms knowledge of the location of the proposed Olthoff Drive Industrial Park Roadway Expansion Project and appurtenant construction in the City of Muskegon of Muskegon County, Michigan, and the conditions under which it must be constructed; and also declares to have carefully examined the Drawings, Specifications, and Contract Documents which the Bidder understands and accepts as sufficient for the purpose of constructing said Project, and appurtenant work, and agrees to contract with the City of Muskegon to furnish all labor, materials, tools, equipment, facilities and supervision necessary to do all the work specified and prescribed for the City of Muskegon, in strict accordance with the Owner's General Conditions,

and with the full intent of the Drawings and Specifications, prepared by Hubbell, Roth & Clark, Consulting Engineers, and will accept in full payment therefore the sum of:

BASE BID

<u>Item</u>	<u>Quantity</u>		<u>Unit Price</u>	<u>Total Cost</u>
1. Mobilization, Max - LSUM	1	@	\$ _____	= \$ _____
2. Clearing - Acre	0.5	@	\$ _____	= \$ _____
3. Sewer, Rem, Less than 24 inch - Ft	6	@	\$ _____	= \$ _____
4. Curb and Gutter, Rem - Ft	630	@	\$ _____	= \$ _____
5. Fence, Rem - Ft	30	@	\$ _____	= \$ _____
6. Embankment, CIP - Cyd	430	@	\$ _____	= \$ _____
7. Excavation, Earth - Cyd	4325	@	\$ _____	= \$ _____
8. Machine Grading - Sta	33	@	\$ _____	= \$ _____
9. Erosion Control, Silt Fence - Ft	1421	@	\$ _____	= \$ _____
10. Aggregate Base, 6 inch - Syd	8709	@	\$ _____	= \$ _____
11. Sewer, CI IV, 12 inch, Tr Det A - Ft	421	@	\$ _____	= \$ _____
12. Sewer, CI IV, 12 inch, Tr Det B - Ft	88	@	\$ _____	= \$ _____
13. Video Taping Sewer and Culv Pipe - Ft	1411	@	\$ _____	= \$ _____
14. Dr Structure, Tap, 12 inch - Ea	1	@	\$ _____	= \$ _____
15. Catch Basin, Removal and Relocation - Ea	4	@	\$ _____	= \$ _____
16. Catch Basin, Special, 48 inch dia - Ea	4	@	\$ _____	= \$ _____
17. Dr Structure Cover, Adj, Case 1, Modified - Ea	1	@	\$ _____	= \$ _____
18. Dr Structure Cover, Type K, Modified - Ea	14	@	\$ _____	= \$ _____
19. Leaching Basin, 48 inch dia - Ea	8	@	\$ _____	= \$ _____
20. Sanitary Manhole Cover - Ea	3	@	\$ _____	= \$ _____
21. Underdrain, Subgrade, 12 inch - Ft	876	@	\$ _____	= \$ _____
22. HMA Surface, Rem - Syd	4485	@	\$ _____	= \$ _____
23. HMA, 4EML - Ton	1763	@	\$ _____	= \$ _____
24. Curb and Gutter, Conc, Det F4 - Ft	3346	@	\$ _____	= \$ _____
25. Post, Steel, 3 lb - Ft	120	@	\$ _____	= \$ _____
26. Sign, Type III, Erect, Salv - Ea	2	@	\$ _____	= \$ _____
27. Sign, Type III, Rem - Ea	2	@	\$ _____	= \$ _____
28. Sign, Type IIIB - Sft	43	@	\$ _____	= \$ _____
29. Reflective Panel for Permanent Sign Support, 6 foot - Ft	4	@	\$ _____	= \$ _____
30. Pavt Mrkg, Waterborne, 4 inch, Yellow - Ft	2954	@	\$ _____	= \$ _____
31. Gate Valve and Box, 8 inch - Ea	6	@	\$ _____	= \$ _____
32. Gate and Valve Box, 12 inch - Ea	1	@	\$ _____	= \$ _____
33. Hydrant, Relocate, Case 2 - Ea	2	@	\$ _____	= \$ _____
34. Water Main, 8 inch, Cut and Plug - Ea	6	@	\$ _____	= \$ _____
35. Live Tap, 12 inch by 16 inch - Ea	1	@	\$ _____	= \$ _____
36. Gate Box, Adj, Case 1 - Ea	1	@	\$ _____	= \$ _____
37. Water Main, DI, 12 inch, Tr Det G - Ft	1355	@	\$ _____	= \$ _____
38. Water Main, DI, 8 inch, Tr Det G - Ft	422	@	\$ _____	= \$ _____
39. Bend, 12 inch, 22.5 Degree, DI MJ - Ea	2	@	\$ _____	= \$ _____
40. Bend 12 inch, 45 Degree, DI MJ - Ea	22	@	\$ _____	= \$ _____
41. Hydrant, 6 inch, Standard - Ea	5	@	\$ _____	= \$ _____
42. Reducer, 12 inch X 8 inch, DI MJ - Ea	1	@	\$ _____	= \$ _____
43. Tee, 12 inch X 6 inch, DI MJ - Ea	5	@	\$ _____	= \$ _____

44. Tee, 12 inch X 8 inch, DI MJ - Ea	5	@	\$ _____	= \$ _____
45. Tee, 16 inch X 12 inch, DI MJ - Ea	1	@	\$ _____	= \$ _____
46. Sanitary Sewer, PVC, 8 inch, Tr Det B2 - Ft	127	@	\$ _____	= \$ _____
47. Sanitary Sewer, PVC, 12 inch, Tr Det B2 - Ft	791	@	\$ _____	= \$ _____
48. Sanitary Structure, 48 inch dia - Ea	3	@	\$ _____	= \$ _____
49. Sanitary Structure, Tap, 12 inch - Ea	1	@	\$ _____	= \$ _____
50. Sanitary Structure Cover, Adj, Case 2 - Ea	1	@	\$ _____	= \$ _____

Total Amount of Bid \$ _____

ALTERNATES

Voluntary Alternates proposed by the Bidder will not be considered. The Bidder shall submit a bid based on the information shown on the Drawings and Specifications. Alternates listed below are for the Owner's convenience and shall be priced as indicated by the work description. All alternates shall be clearly marked whether they represent an add or deduct to the Base Bid Price quoted herein. All Alternates which are quoted shall be complete and the price shall include all Bidder mark-ups. Each Alternate shall be clearly marked if it represents an Add or a Deduct from the Base Bid Price.

No Alternates are proposed.

The Owner reserves the right to award the Base Bid or the Base Bid plus any or individual Alternate or combination of Alternates, depending upon the availability of funds.

The Owner, at its sole discretion, reserves the right to award to the Bidder who, in the sole determination of the Owner, will best serve the interest of the Owner. The Owner reserves the right to accept any bid, to reject any or all bids, to waive any and all informalities involving price, time, or changes in the work, and to negotiate contract terms with the successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional bids. However, it is the intention of the Owner to award to the low total bid to one bidder. Also, the Owner reserves the right to reject the bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the bid is not responsive or the Bidder is unqualified, of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Owner.

Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

Each Proposal must be accompanied by a bid deposit in the form of a certified check, cashier's check or bid bond, executed by the bidder and Surety Company, payable to the City of Muskegon in the amount of Five Percent (5%) of the amount of the Proposal. See Instructions to Bidders – Bid Deposit for more information.

TAXES

The Bidder affirms that all applicable Federal, State and Local taxes of whatever character and description are included in all prices stated in this Form of Proposal.

ADDENDA

The Bidder acknowledges the following Addenda, covering revisions to the drawings or specifications and the cost, if any, of such revision has been included in the quoted proposal:

Addendum No. _____	Dated _____
Addendum No. _____	Dated _____
Addendum No. _____	Dated _____
Addendum No. _____	Dated _____

FEES

The Bidder shall refer to the General Conditions for allowable Fees for additional work performed, upon Owner's written authorization, by Bidder's own forces and/or for additional work, upon Owner's written authorization, by Bidder's subcontractors.

TIME OF COMPLETION

If awarded the Contract for the Olthoff Drive Industrial Park Roadway Extension Project, we agree to have all work substantially completed by June 1, 2023. Substantial Completion is defined that the facility is ready to use for its intended purpose with all utility systems fully functional.

The Bidder hereby agrees to furnish the required Bonds, Insurance Certificates, and Policies within ten (10) days after acceptance of this Proposal.

Final Completion with all clean-up and punch-list items shall be complete by June 30, 2023.

The execution of all work and specific constraints as described in the contract drawings and specifications, with particular reference to Section 02030 Sequence of Construction and Special Project Requirements, must be strictly adhered to.

LIQUIDATED DAMAGES

Time is of the essence for completion of this project in order to have the Project ready for the City of Muskegon (OWNER). The Bidder guarantees that the work will be completed within the time limit stated herein before or within the time as extended as provided elsewhere in the Specifications. Inasmuch as the damage and loss to the Owner which will result from the failure of the Bidder to complete the work within the stipulated time, will be most difficult or impossible to accurately determine, it is mutually agreed that the damages to the Owner for such delay and failure on the part of the Bidder shall be liquidated in the amount of Five Hundred Dollars (\$500.00), for each and every calendar day by which the Bidder shall fail to complete the work or any part thereof within the provisions hereof, and such liquidated damages shall not be considered as a penalty.

The Owner will deduct and retain out of any money due or to become due hereunder the amount of the liquidated damages, and in case those amounts are less than the amount of actual liquidated damages, the Bidder shall pay the difference upon demand of the Owner.

We understand that liquidated damages may be assessed should we fail to meet the stipulated completion dates. Specifically, liquidated damages will be assessed daily beginning June 1, 2023 until such a time that Substantial Completion is achieved and further if all work is not completed by the Final Completion Date.

BIDS TO REMAIN FIRM

The price stated in this Proposal shall be guaranteed for a period of not less than [XX] days from the bid due date and if authorized to proceed within that period, the bidder agrees to complete the work covered by the Proposal at said price.

If this Proposal is accepted by the Owner and the undersigned shall fail to contract as aforesaid and to furnish the required surety bonds within fifteen (15) days after being notified of the acceptance of their bid, then the undersigned shall be considered to have abandoned the contract, and the Certified Check, Cashier's Check or Bid Bond accompanying this Proposal shall be forfeited to the [Village, City, Township] of _____.

If the undersigned enters into the contract in accordance with their proposal, or if their proposal is not accepted, then the accompanying bid guarantee shall be returned to the undersigned.

Company Name: _____

Signature: _____ Title: _____

Address: _____

County: _____ State: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

LEGAL STATUS OF BIDDER

This Bid is submittal in the name of:

(Print) _____

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

Street _____

City _____

State _____ Zip Code _____

The undersigned hereby declares the 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:

A corporation duly organized and doing business under the laws of the State of _____

NAME AND TITLE

HOME ADDRESS

Signed and Sealed this _____ day of _____, 20__.

By (Signature)

Printed Name of Signer

Title

BID BOND

We, the undersigned, _____

As Principal, hereinafter called the Principal, and _____

A corporation duly organized under the laws of the State of _____

As surety, hereinafter called the SURETY, are held and firmly bound unto:

The Owner: _____

in the sum of _____ Dollars (\$ _____),

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for _____

NOW, THEREFORE, if the OWNER shall accept the bid of the Principal and the Principal shall enter into a contract with the OWNER in accordance with the terms of such bid, and give such bond or bonds as may be specified in the CONTRACT DOCUMENTS with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the OWNER the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the OWNER may in good faith contract with another party to perform the work covered by said bid, then the obligation of the Principal shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____, 20____

(Witness)

(Principal)

(Seal)

(Title)

(Witness)

(Surety)

(Title)

END OF SECTION

SECTION 00310

BID ITEM DESCRIPTION

PART 1 GENERAL

1.1 SCOPE

- A. This Section describes the method of measurement and basis of payment for several items of Work included in the Contract and specified in the Proposal.
 - 1. The Contractor shall provide all labor, material, tools, equipment and services required to complete the Work specified herein and indicated on the Plans and all other items necessary to complete the job, whether specifically mentioned or implied.
 - 2. Payment will only be made for the items listed in the Proposal Form.
- B. The Owner will make no allowances for items not included in the Proposal Form.

1.2 ITEMS OF THE PROPOSAL

Mobilization, Max (up to 10%)

This bid item shall be paid for at the Contract Unit Price per **lump sum** basis. The Work required by this item shall include, but not be limited to, the preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of the Contractor's offices, buildings, and other facilities necessary to undertake the Work on the project; and for other work and operations which must be performed or for expenses incurred prior to beginning work on the various contract items on the project site. It shall also include pre-construction costs, exclusive of bidding costs, which are necessary direct costs to the project and are of a general nature rather than directly attributable to other pay items under the contract. The Work shall include all demobilizations and remobilizations which are required due to seasonal suspension of the Work. This contract pay item also includes all other items and costs not included in the price bid for specific items such as overhead, insurance, permits, safety program, coordination with others, and the like. All cost to the Contractors for full compliance with all requirements of the General Conditions sections shall also be included in this pay item.

The Contract Unit Price for Mobilization **shall not exceed ten (10) percent** of the Total Amount of Bid minus the amount for this pay item.

Additional unit prices will not be paid for the Contractor to remobilize to the site regardless of the staging or sequence of construction preferred by the Contractor. The initial payment for the project shall not be made until construction has been started and a schedule of values for the project has been approved. The total sum of all payments for this item shall not exceed the original contract amount bid for MOBILIZATION, regardless of the fact that the Contractor may have, for any reason, shut down his work on the project, moved equipment away from the project and then back again, or for additional quantities or items of work added to the contract.

Clearing

This bid item shall be paid for at the Contract Unit Price per **acre**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Sewer, Rem, Less than 24 inch

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Curb and Gutter, Rem

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Fence, Rem

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Embankment, CIP

This bid item shall be paid for at the Contract Unit Price per **cubic yard**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Excavation, Earth

This bid item shall be paid for at the Contract Unit Price per **cubic yard**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Machine Grading

This bid item shall be paid for at the Contract Unit Price per **station**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Erosion Control, Silt Fence

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Work included and required by this item are described herein and on the plans.

This work will be performed at locations where required and as shown on the construction drawings.

Aggregate Base, 6 inch

This bid item shall be paid for at the Contract Unit Price per **square yard**. Measurement and payment and the Work included and required by this item are described herein and on the plans. The Aggregate will be obtained from stockpile of 21AA gravel located on site.

This work will be performed at locations where required and as shown on the construction drawing.

Sewer, CI IV, 12 inch, Tr Det A

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Sewer, CI IV, 12 inch, Tr Det B

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

Video Taping Sewer and Culv Pipe

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Dr Structure, Tap, 12 inch

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Catch Basin, Removal and Relocation

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, and in the plans.

This work will be performed at locations where required and as shown on the construction drawings.

Catch Basin, Special, 48 inch dia

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02737.

This work will be performed at locations where required and as shown on the construction drawings.

Dr Structure Cover, Adj, Case 1, Modified

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and in section 02739.

This work will be performed at locations where required and as shown on the construction drawings.

Dr Structure Cover, Type K, Modified

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and in section 02738.

This work will be performed at locations where required and as shown on the construction drawings.

Leaching Basin, 48 inch dia

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02735.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Manhole Cover

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein and on the plans.

This work will be performed at locations where required and as shown on the construction drawings.

Underdrain, Subgrade, 12 inch

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawing.

HMA surface, Rem

This bid item shall be paid for at the Contract Unit Price per **square yard**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

HMA, 4EML

This bid item shall be paid for at the Contract Unit Price per **ton**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Curb and Gutter, Conc, Det F4

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Post, Steel, 3 lb

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sign, Type III, Erect, Salv

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sign, Type III, Rem

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sign, Type IIIB

This bid item shall be paid for at the Contract Unit Price per **square foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Reflective Panel for Permanent Sign Support, 6 foot

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Pavt Mrkg, Waterborne, 4 inch, Yellow

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Gate Valve and Box, 8 inch

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Gate Valve and Box, 12 inch

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Hydrant, Relocate, Case 2

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Water Main, 8 inch, Cut and Plug

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Live Tap, 12 inch by 16 inch

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Gate Box, Adj, Case 1

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Water Main, DI, 12 inch, Tr Det G

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Water Main, DI, 8 inch, Tr Det G

This bid item shall be paid for at the Contract Unit Price per **lineal foot**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Bend, 12 inch, 22.5 degree, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Bend, 12 inch, 45 degree, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Hydrant, 6 inch, Standard

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02671.

This work will be performed at locations where required and as shown on the construction drawings.

Reducer, 12 inch X 8 inch, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Tee, 12 inch, X 6 inch, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Tee, 12 inch, X 8 inch, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Tee, 16 inch, X 12 inch, DI MJ

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans, and in section 02663.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Sewer, PVC, 8 inch, Tr Det B2

This bid item shall be paid for at the Contract Unit Price per **lineal feet**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Sewer, PVC, 12 inch, Tr Det B2

This bid item shall be paid for at the Contract Unit Price per **lineal feet**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Structure, 48 inch dia

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Structure, Tap, 12 inch

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein, on the plans and according to the MDOT 2020 Standard Specifications for Construction.

This work will be performed at locations where required and as shown on the construction drawings.

Sanitary Structure Cover, Adj, Case 2

This bid item shall be paid for at the Contract Unit Price per **each**. Measurement and payment and the Work included and required by this item are described herein and on the plans.

This work will be performed at locations where required and as shown on the construction drawings.

END OF SECTION

CONTRACT

ARTICLES OF AGREEMENT, Made and entered into this _____
day of _____, 20__, by and between

(A Michigan Municipal Corporation),

Party of the first part, hereinafter called the Owner, and _____

in the _____, County of _____
and State of Michigan, Party of the second part, hereinafter called the Contractor, to wit:

Item 1) That all proposals, specifications, plans, bonds, etc., hereto attached or herein referred to, shall be and are made a part of this agreement and contract.

Item 2) That the Contractor, under penalty of bond attached, shall furnish all labor, materials, and appliances necessary, and do all the work as set forth in the proposal.

HRC Job No. _____

according to the specifications, plans, etc., which have been made a part of this contract in a manner, time, and place, all and singular, as herein set forth.

IN CONSIDERATION WHEREOF, said Party of the First Part, for it and its successors, promises and agrees to pay to said Party of the Second Part, the sum of:

Dollars (\$ _____)

as provided in the attached proposal, all in the time and manner indicated in the specifications.

For the faithful performance of all and singular of the stipulations, terms and conditions of this Agreement, said parties respectfully bind themselves, their successors, heirs, executors, administrators and assigns.

IN WITNESS WHEREOF, Said Parties have signed this Contract, in duplicate, on the date first above written.

WITNESS:

(A Michigan Municipal Corporation)

Party of the First Part

By: _____

WITNESS:

(A Michigan Corporation)

Party of the Second Part

By: _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we, the undersigned _____

_____ as Principal,

and _____

of _____ as Sureties,

are hereby held and firmly bound unto the "Owner" _____

in the full and just sum of _____ Dollars

(\$ _____) for the payment of which well and truly to be made, we hereby jointly and severally

bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed and sealed this _____ day of _____ 20__.

The condition of the above obligation is such that if said _____

shall well and faithfully do and perform the things agreed by _____ It
to be done and performed by the annexed contract, according to the terms thereof, then this obligation shall be
void; otherwise, the same shall remain in full force and effect.

It is mutually understood and agreed that in cases where changes are required, either by order of the Engineer, or Owner, or by mutual agreement, such changes or changes shall not modify, discharge or release this bond.

(A Michigan Corporation)

(Seal)

(Seal)

Principal

(Seal)

(Seal)

Surety

Signed, Sealed and Delivered
in the Presence of:

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____

_____ of _____ hereinafter called the Principal,

and _____

_____ hereinafter called the Surety, are held and firmly bound unto _____

_____ in the sum of _____

_____ Dollars (\$ _____)

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.

Sealed with our seals and dated this _____ day of _____

_____, A.D., 20__.

WHEREAS, The above named Principal has entered into a contract with _____

_____ dated the _____ day of _____, A.D., 20__, wherein said Principal has covenanted and agreed as follows, to-wit:

To furnish all the labor and material _____

_____ HRC Job No. 20210307

AND WHEREAS, This bond is given in compliance with and subject to the provisions of Act No. 213 of the Public Acts of Michigan, for the year 1963, and as may be amended by other Public Acts of Michigan.

NOW, THEREFORE, The condition of this obligation is such that if payment shall be made by the Principal to any Subcontractor or by him or any Subcontractor as the same may become due and payable of all indebtedness which may arise from him to a Subcontractor or party performing labor or furnishing materials or supplies or any Subcontractor to any person, firm or corporation on account of any labor performed or materials or supplies furnished in the performance of said contract, then this obligation shall be void; otherwise, the same shall be in full force and effect.

AND PROVIDED, That any alterations which may be made in the terms of said contract, or in the work to be done under it, or the giving by the party of the first part to said contract, of any extension of time for the performance of said contract, or any other forbearance on the part of either party to the other, shall not in any way release the Principal and the Surety, or either of them, their heirs, executors, administrators, successors or assigns from any liability hereunder, notice to the Surety of any alteration, extension, or forbearance being hereby waived.

(A Michigan Corporation) _____

By: _____

Principal

Surety

Signed, Sealed and Delivered
in the Presence of:

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENTS, That we

as Principal, and _____

are held and firmly bound unto _____

in the sum of _____ Dollars (\$ _____)

good and lawful money of the United States of America, to be paid to the _____
its legal representatives and assigns, and we bind ourselves, our heirs, executors, administrators, successors and
assigns, and each and every one of them jointly and severally, firmly by these presents.

SEALED WITH OUR SEALS AND DATED THIS _____ DAY OF _____ A.D., 20__.

WHEREAS, the above named principal has entered into a certain written contract with the _____

dated this ___ day of _____ A.D., 20__, where in the said principal covenanted and agreed as follows, to wit:

for the: _____

HRC Job No. 20210307

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under such contract,
the above named principal has agreed with the _____ that for a period of _____ (____)
year(s) from the date of approval of the Final Estimate, to keep in good order and repair any defect in all the
work done under said contract, either by the principal, his subcontractors, or his material suppliers, that may
develop during said period due to improper materials, defective equipment, workmanship or arrangements, and
any other work affected in making good such imperfections, all to be made good without expense to the Owner,
(excepting only such part or parts of said work as may have been disturbed without the consent or approval of
the principal after the final acceptance of the work), and whenever directed so to do by the Owner, by notice
served in writing, either personally or by mail, on the principal at _____

or _____, its legal representatives, or successors, or on
the surety at _____

to proceed at once to make such repairs as directed by the Owner and in case of failure to do so within one (1) week from the date of service of such notice, or within reasonable time not less than one (1) week, as shall be fixed in said notice, then the Owner shall have the right to purchase such materials and employ such labor and equipment as may be necessary for the purpose, and to undertake, do and make such repairs, and charge the expense thereof to, and be fully reimbursed for same from said principal or surety. If any repair is necessary to be made at once to protect life and property, the Owner may take immediate steps to repair or barricade such defects without notice to the contractor. In such case the Owner shall not be held to obtain the lowest figures for the doing of the work, or any part thereof, but all sums actually paid therefor shall be charged to the principal or surety. In this connection the judgment of the Owner is final and conclusive.

If the principal for a period of one (1) year from the date of approval of a Final Estimate, shall keep the work so constructed under the contract in good order and repair, excepting only such parts of said work which have been disturbed without the consent or approval of the principal after the final acceptance of same, and whenever notice is given as hereinbefore specified, at once proceed to make the repair as the notice directs, or reimburse the Owner for any expenses incurred by it in making such repairs should the principal or surety fail to do so, then the above obligation shall be void; otherwise, it will remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____, 20__.

Signed, Sealed and Delivered
in the Presence of:

"Principal"

Witness

(L.S.)

Witness

"Surety"

(L.S.)

Witness

(L.S.)

GENERAL CONDITIONS – CONTRACTOR LAYOUT
TABLE OF CONTENTS

1. Contract Documents.....	2	23. Patents.....	10
2. Contract Drawings and Specifications.....	2	24. “Or Equal” Clause	11
3. Engineer’s Status	2	25. Cleaning Up	11
4. Construction Observer Status	3	26. Use of Complete Portions of the Work.....	11
5. Contractor’s Responsibility	3	27. Payment Withheld	11
6. Permits and Regulations	3	28. Contractor’s Right to Stop Work.....	12
7. Subcontracts.....	4	29. Fair Employment Practices Act	12
8. Information by the Contractor	4	30. Authority.....	12
9. General Requirements for Materials and Workmanship	4	31. Starting Work	12
10. Testing and Sampling	5	32. Sanitary Regulations.....	12
11. Lines and Grades.....	5	33. Sunday and Night Work	12
12. Protection of Work and Property	5	34. Progress of Work	13
13. Responsibility for Adjoining Structures and Trees.....	6	35. Time of Completion.....	13
14. Maintenance of Service.....	6	36. Extension of Time.....	13
15. Storage of Materials.....	7	37. Time is Essence of Contract	13
16. Relation to Other Contractors	7	38. Estimated Quantities.....	13
17. Contractor’s Supervision and Origination.....	7	39. Forfeiture of Contract	13
18. Facilities for Inspection.....	7	40. No Waiver of Contract.....	14
19. Shop Drawings.....	8	41. Payment Not to Be Stopped.....	14
20. Errors and Corrections in Drawings and Specifications	8	42. Guarantee.....	14
21. Changes in the Work.....	8	43. Estimates and Payments	14
22. Basis for Determining Cost of Changes in the Work	9	Contractor’s Declaration	17
		Contractor’s Affidavit	18

GENERAL CONDITIONS

1. CONTRACT DOCUMENTS

The original and three copies of the Contract shall be signed by the Owner and the Contractor, unless otherwise required.

The work under this Contract shall consist of the items listed in the proposal, including all incidentals necessary to fully complete the project in accordance with the contract Documents. The Contract documents shall consist of the Advertisement, Instructions to Bidders, Proposal, Specifications, General Conditions, General Supplementary Conditions, Contract, Bonds and Contract Drawings.

2. CONTRACT DRAWINGS AND SPECIFICATIONS

The work to be done is shown on the accompanying set of original drawings prepared by Hubbell, Roth & Clark, Inc., Consulting Engineers, Bloomfield Hills, Michigan, and are hereby made a part of this Contract, it being mutually understood and agreed that when taken together, the drawings and contract documents, including the specifications and the general conditions, are complementary, and what is called for by any one shall be binding as if called for by all. The intent of the Contract documents is to include in the contract price the cost of all labor and materials, water, fuel, tools, plant, equipment, light, transportation, and all other expenses as may be necessary for the proper execution and completion of the work.

These original drawings may be supplemented by other drawings furnished by the contractor and approved by the Engineer or supplied to the Contractor by the Engineer during the progress of the work as he may deem to be necessary or expedient. All such supplementary contract drawings or instructions are intended to be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. Therefore, no extra charge will be allowed on a claim that particular supplemental contract drawings or instructions differed from the Contract Documents, incurring extra work, unless the Contractor has first brought the matter, in writing, to the Engineer's attention for proper adjustment before starting on the work covered by such and has received from the Engineer an order in writing to so proceed.

These original and supplementary drawings constitute the drawings according to which the work is to be done. The Contractor shall keep at the site of the work an approved or conformed copy of all drawings and specifications and shall at all times give the Engineer or Owner access thereto.

In case any inconsistency, omission or conflict shall be discovered in either specifications or drawings, or if in any place, the meaning of either or both shall be obscure, or uncertain, or in dispute, the Engineer shall decide as to the true intent and his decision shall be final and binding.

3. ENGINEER'S STATUS

The Engineer shall furnish consultation and advice to the Owner during construction. He may advise the Owner to stop the work whenever such stoppage may be necessary to insure that the finished work will be in accordance with the plans and specifications. He may advise the Owner to reject all work and material which do not conform to the drawings and specifications. The engineer may stop work only under the written direction of the owner.

4. CONSTRUCTION OBSERVER STATUS

The Owner may appoint on the job construction observer(s) who shall be under the direction of the Engineer. The construction observer on the work will inform the Engineer as to the progress of the work, the manner in which it is being done, and the quality of the materials being used. The construction observer will call to the attention of the Contractor any failure to follow the drawings and specifications that he may observe. The construction observer shall advise the Engineer to reject materials suspend the work until any questions on the performance of the work can be referred to and decided by the Owner. The construction observer shall have no authority to determine the means and methods used to complete the work, direct the Contractor's work or workmen, to supervise the Contractor's operations, to stop work on the project or to change the Contract Drawings or Specifications.

In no instance shall any action or omission on the part of the construction observer release the Contractor of the responsibility of completing the work in accordance with the drawings, specifications and/or, municipal ordinances or established prior practices of the owner, in the municipality in which the project resides.

5. CONTRACTOR'S RESPONSIBILITY

The Contractor shall assume full responsibility for the work, specifically including jobsite safety, and take all precautions for preventing injuries to persons and property on or about the work; shall bear all losses resulting to him on account of the amount or character of the work or because the conditions under which the work is done are different, or because the nature of the ground in which the work is done is different from what was estimated or expected, or on account of the weather, floods, elements or other causes, and he shall assume the defense and save harmless the Owner, the Engineer and their individual officers and agents from all claims relating to labor provided and materials furnished for the work; to inventions, patents, and patent rights used in doing the work; to injuries to any persons or property received or sustained by or from the Contractor, his agents or employees in doing the work or arising out of the work performed or to be performed; and to any act, or neglect of the Contractor, his agents or employees.

The mention of any specific duty or liability of the contractor in this or in any part of the Contract documents shall not be construed as a limitation or restriction upon any general liability or duty imposed on the contractor by the Contract Documents.

6. PERMITS AND REGULATIONS

The Contractor shall secure, at no cost to the Owner, all permits and licenses necessary for the prosecution of the work. The Contractor shall keep himself fully informed of all laws, ordinances, and regulations in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.

He shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders, and decrees. Provided that if the drawings and specifications are at variance therewith, the Contractor shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided in the Contract Documents.

7. SUBCONTRACTS

The Contractor shall not sublet, assign, or transfer this Contract or any portion thereof or any payments due him thereunder, without the written consent of the Owner.

Assignment or subletting the whole or any portion of this contract shall not operate to release the contractor or his bondsmen hereunder from any of the contract obligations.

The Contractor shall, as soon as practicable after the signing of the Contract, notify the Owner in writing of the names of subcontractors proposed for the work and shall not employ any that the Owner may object to as incompetent or unfit.

If the Contractor shall cause any part of the work under this Contract to be performed by a subcontractor, the provisions of this Contract shall apply to such subcontractor and his officers and employees in all respects as if he and they were employees of the Contractor, and the Contractor shall not be in any manner thereby relieved from his obligation and liabilities; and the work and materials furnished by the subcontractor shall be subject to the same provisions as if furnished by the Contractor.

8. INFORMATION BY THE CONTRACTOR

The Contractor shall submit to the Engineer full information as to the materials, equipment, and arrangements which the Contractor proposes to furnish. This information shall be complete to the extent that the Engineer may intelligently judge if the proposed materials, equipment, and arrangements will meet the contract requirements.

Prior to the approval of materials, equipment, and arrangements by the Engineer based on the information submitted by the Contractor, any work done by the Contractor shall be at his own risk.

The approval of information covering materials, equipment, and arrangements by the Engineer shall in no way release the Contractor from his responsibility for the proper design, installation, and performance of any material, equipment, or arrangement, or from his liability to replace same should it prove defective.

9. GENERAL REQUIREMENTS FOR MATERIALS & WORKMANSHIP

In the specifications where a particular material or piece of equipment is specified by reference to some particular make or type, or equal, it is not the intent to limit competition but to set up by such reference a standard of quality most easily understood and defined. If materials or equipment of other make or type than that specified by name are offered by the Contractor, they will be given full consideration by the Engineer and the Engineer's decision will be final as to whether the materials or equipment offered are equal to those specified.

Unless otherwise stipulated in the specifications, all equipment, materials, and articles incorporated in the work covered by this Contract are to be new and of the best grade of their respective kinds for the purpose. The Contractor shall, if required, furnish such evidence as to kinds and quality of materials as the Engineer may require.

The Contractor shall furnish suitable tools and building appliances and employ competent labor to perform the work to be done, and any labor or tools or appliances that shall not, in the judgment of the Engineer, be suitable or competent to produce this result may be ordered from the work by the Owner, at the advice of the Engineer, and such labor or tools or appliances shall be substituted therefor by the Contractor as will meet with the approval of the Engineer/Owner.

If not otherwise provided, material or work called for in this contract shall be furnished and performed in accordance with well known established practice and standards recognized by architects, engineers and the trade.

10. TESTING AND SAMPLING

Where called for in the specifications, samples of materials in the quantity named shall be submitted to the Engineer for approval. Where tests are required they shall be made at the expense of the Contractor, except as otherwise called for in the specifications. For materials covered by ASTM or Federal Specifications, unless otherwise stipulated, the required tests are to be made by the manufacturer and his certificate therefor submitted to the Engineer.

11. LINES AND GRADES

All lines and grades shall be established by the Contractor. Establishment of principal reference lines, transfer of line and grade into facilities, location of all piping and equipment shall be the responsibility of the Contractor.

12. PROTECTION OF WORK AND PROPERTY

The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect all public property and private abutting property from injury or loss arising in connection with this Contract. He shall, without delay, make good any such damage, injury or loss, and shall defend and save the Owner and Engineer harmless from all such damages or injuries occurring because of his work. He shall furnish and maintain all passageways, barricades, guard fences, lights and danger signals, provide watchmen and other facilities for protection required by public authority or by local conditions, all at no additional cost to the Owner.

In an emergency affecting the safety of life or of the work or of adjoining property, the Contractor, without special instruction or authorization from the Owner, shall take such action as may be necessary to prevent such threatened damage, injury or loss.

The Contractor shall assume full responsibility of loss or damage to the work during the entire construction period resulting from caving earth and from storms, floods, frosts, and other adverse weather conditions, and from all other causes whatsoever, not directly due to the acts or neglect of the Owner, including fire, vandalism and malicious mischief, and shall turn the finished work over to the Owner in good condition and repair, at the time of the final estimate.

13. RESPONSIBILITY FOR ADJOINING STRUCTURES & TREES

The Contractor shall assume full responsibilities for the protection of all pavements, curbs, bridges, railroads, poles and any other surface structures and all water mains, sewers, telephone, gas mains, and other underground services and structures along the near the work which maybe affected by his operations, and shall indemnify, defend and save harmless the Owner against all damages or alleged damages to any such structure arising out of his work. The Contractor shall bear the cost of repair or replacement of any such structure damaged as a result of his operations.

No trees or shrubbery of any kind shall be removed or destroyed by the Contractor without the written permission of the Owner, and the Contractor will be held fully responsible for any damages caused by

his work to adjoining trees and shrubs. Ample precautions shall be taken by the Contractor to protect such trees and shrubs as are to remain in place by surrounding them with fences or other protection before construction work begins. Shrubbery that has to be removed shall be preserved and replaced in a manner acceptable to the Owner.

14. MAINTENANCE OF SERVICE

Drainage through existing sewers and drains shall be maintained at all times during construction and all nearby gutters shall be kept open for drainage. Where existing sewers are encountered in the line of the work which interfere with the construction, the flow in the sewers, including both dry weather flow and storm flow, shall be maintained.

All detours shown on the drawings or required because of the Contractor's operations shall be built and maintained at the Contractor's expense.

Safety precautions shall be followed at all street openings, substantial barricades shall be erected as deemed necessary to prevent accidents to vehicular or pedestrian traffic and red flags by day and yellow lights by night shall be diligently posted by the Contractor at all points of possible danger. In case detours or other traffic instructions are necessary, suitable warning or direction signs shall be erected and maintained by the Contractor. Contractor shall be responsible for insuring that all barricades, flags, lights, etc. are in place and functional at the end of each day.

During the progress of the work, the Contractor shall accommodate both vehicular and foot traffic and shall provide free access to fire hydrants, water and gas valves. Except as otherwise specified herein or as noted on the drawings, street intersections may be blocked but one-half at a time, and the contractor shall lay and maintain temporary driveways, bridges and crossings, such as in the opinion of the Owner are necessary to reasonably accommodate the public.

In the event of the Contractor's failure to comply with these provisions, the Owner may with or without notice, cause the same to be done; and will deduct the cost of such work from any money due or to become due the Contractor under this Contract, but the performance of such work by the Owner or at his instance, shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the work.

15. STORAGE OF MATERIALS

Materials and equipment distributed, stored and placed upon or near the site of the work shall at all times be so disposed as not to interfere with work being prosecuted by other contractors in the employ of the Owner, or with street drainage, or with fire hydrants or with access thereto, and not to hinder, any more than may be necessary, the ordinary traffic of the street.

16. RELATION TO OTHER CONTRACTORS

The Contractor shall so conduct his operations as not to interfere with or injure the work of other contractors or workmen employed on adjoining or related work and he shall promptly make good any injury or damage which may be done to such work by him or his employees or his agent. Should a contract for adjoining work be awarded to another contractor, and should the work of one of these contracts interfere with that of the other, the Owner shall decide which contractor shall cease work for the time being and which shall continue or whether the work in both contracts shall continue at the same time and in what manner.

17. CONTRACTOR'S SUPERVISION AND ORIGINATION

The work under this Contract shall be under the direct charge and direction of the Contractor. The Contractor shall give efficient superintendence to the work, using his best skill and attention. The Contractor shall at all times keep on the site of the work, during its progress, a competent superintendent and any and all necessary foremen and assistants. The superintendent shall represent and have full authority to act for the Contractor in the latter's absence, and all directions given to him shall be as binding as if given to the Contractor. On written request in each case, all such directions will be confirmed in writing to the Contractor.

The Contractor shall employ only competent, efficient workmen and shall not use on the work any unfit person or one not skilled in the work assigned to him, and he shall at all times enforce strict discipline and good order among his employees. Whenever the Owner shall notify the Contractor, in writing, that any man on the work is, in the opinion of the Owner, careless, incompetent, disorderly, or otherwise unsatisfactory, such man shall be discharged from work and shall not again be employed on it except with the written consent of the Owner.

The Contractor shall establish and maintain an office on the site of the work or at some convenient point adjacent thereto, during the continuance of this Contract and shall have at all times during working hours, a representative authorized to receive and execute any and all orders, when given by the Engineer; and such order, when given out and received by said representative shall be deemed to have been given to and received by the Contractor. Copies of the drawings and specifications shall at all times be kept on file by the Contractor at readily accessible points near the work.

18. FACILITIES FOR INSPECTION

The Owner, the Engineer, and their employees shall at all times have the right to enter upon the premises upon which work is being done, or upon which material is stored for the work under this Contract, and to inspect the work under this Contract, and to inspect the work and materials, and to ascertain whether or not the construction is carried out in accordance with this Contract, and the Contractor shall furnish all reasonable facilities, and give ample time for such inspection. All materials shall be subject to mill and shop inspection, as provided in the specifications.

The Contractor shall promptly remove from the premises all materials rejected by the Engineer as failing to meet contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contractor and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such rejected work and materials promptly, after written notice, the Owner may remove them and store the material at the expense of the Contractor.

The Engineer has the right to have removed by the Contractor such portion of the work as he may deem necessary for the discovery of improper work or material, and the Contractor must restore such work at his own expense if improperly done and at the expense of the party of the first part if found to be in proper condition. Any work which, during its progress and before its final acceptance, may become damaged from any cause, shall be removed and replaced by good, satisfactory work at the Contractor's expense.

19. SHOP DRAWINGS

Where called for in the specifications, the Contractor shall submit to the Engineer for review copies of details, specifications, cuts, and drawings of such equipment and structural work as may be required. The Contractor shall make any changes or alterations required by the Engineer and re-submit same without delay. The review of the Engineer shall not relieve the Contractor of responsibility for errors in the drawings, as the Engineer's checking is intended to cover compliance with the drawings and specifications and not to enter into every detail of the shop work. No work shall be undertaken until the Engineer has reviewed the shop drawings.

20. ERRORS AND CORRECTIONS IN DRAWINGS AND SPECIFICATIONS

The Contractor shall examine and check all drawings and specifications furnished by the Owner for dimensions, quantities, and coordination with other parts of the work on this or related contracts and shall notify, in writing, the Engineer of any and all errors, omissions, or discrepancies he may discover by examining and checking of same. The Contractor shall not be allowed to take advantage of any such error, omission, or discrepancy, as full instructions will be furnished by the Engineer, and the Contractor shall carry out such instructions as if originally specified. In no case shall the Contractor proceed with the work in uncertainty, and any work done by the Contractor after the discovery of any error, omission, or discrepancy, until authorized, will be at the Contractor's risk and responsibility. The work is to be made complete and to the satisfaction of the Engineer, notwithstanding any minor omissions in the specifications or drawings.

21. CHANGES IN THE WORK

The Owner shall have the right to require, by written order, changes in, additions to, or deductions from the work required by the contractor documents; provided that if changes, additions, or deductions are made, the general character of the work as a whole is not changed thereby. Adjustments in the contract price, if any, because of any change, addition, or deduction in the work shall be determined as hereinafter provided, and any claim for extension of time for completion shall be adjusted at the time of ordering the change, addition, or deduction. No claim for change, addition, or deduction, or adjustment of price, or extension of time for completion thereof, shall be made or allowed unless done in pursuance of a written order from the Owner specifically authorizing such change, addition, or deduction. Drawings without a written order shall not be considered such authority. Written notice of such claims shall be

made to the Engineer before the commencement of work. Where the written notice of such claims shall be made to the Engineer before the commencement of work. Where the written order diminished the quantity of work to be done, this shall not constitute a basis for a claim for damages or anticipated profits on the work that may be deleted.

Under circumstances which, in the judgment of the Engineer, so necessitate, the Engineer shall have authority to require, by written order, changes in, additions to, or deductions from the work. Such written order by the Engineer shall be subject to later confirmation by the Owner when the extent and cost have been established.

It is understood and agreed that in case any change in, addition to, or deduction from the work is required, said change shall in no way invalidate the Contract and shall not affect or discharge the bonds furnished by the Contractor.

The Contractor, without extra charge, shall make such slight alternations as may be necessary to make adjustable parts fit to fixed parts, leaving all complete and in proper shape when done.

22. BASIS FOR DETERMINING COST OF CHANGES IN THE WORK

Adjustments, if any, in the contract price by reason of change in the work shall be limited to the amount specified in the written order authorizing the change in the work. Adjustments shall be determined by one or more of the following methods, the Owner reserving the right to select the method or methods at the time the written order is issued:

- A. An acceptable lump sum proposal: To facilitate checking and acceptance, the proposal shall be itemized with quantities and prices given for the various items.
- B. Unit Prices: The unit prices may be the "Unit Price" set in the Agreement, or fixed by subsequent agreement between the Owner and the Contractor.
- C. On a cost-plus-limited basis not to exceed a specified maximum limit of cost:
- D. "COST" as herein used shall be the actual and necessary cost incurred by the Contractor by reasons of the change in the work for:
 - 1. Labor
 - 2. Materials
 - 3. Equipment Rental
 - 4. Insurance Premium
 - 5. Labor costs shall be the amount shown on the Contractor's payroll with payroll taxes added when such taxes can be shown to have been incurred. In no case shall be rates charged for labor exceed the rates paid by the Contractor for the same class of labor employed by him to perform work under the regular items of the Contract.
 - 6. Material costs shall be the net price paid for material delivered to the site of the work. If any material previously required is omitted by the written order of the Owner after it has been delivered to or partially worked on by the Contractor and consequently will not retain its full value for other uses, the Contractor shall be allowed the actual cost of the omitted material less a fair market value of the material as determined by the Owner.

7. Equipment Rental shall be the actual additional costs incurred for necessary equipment. Costs shall not be allowed in excess of usual rental charged in the area for similar equipment of like size and condition, including the cost of necessary supplies and repairs for operating the equipment. No costs, however, shall be allowed for the use of equipment on the site in connection with other work unless its use incurs actual and additional costs to the Contractor. If equipment not on the site is required for the change in the work only, the cost of transporting such equipment to and from the site shall be allowed.
8. Insurance Premium shall be limited to those based on labor payroll and to the types of insurance required by the Contract. The amount allowed shall be limited to the net costs incurred as determined from the labor payroll covering the work. The Contractor shall, upon request of the Owner, submit verification of the applicable insurance rates and premium computations.

"PLUS" as herein is defined as a percentage to be added to the items of "Cost" to cover superintendence, use of ordinary tools, bonds, overhead expense and profit. The percentage shall not exceed 15 percent on work done entirely by the Contractor and shall not exceed an aggregate total of 20 percent on work done by a subcontractor.

"SPECIFIED MAXIMUM LIMIT OF COST" is the amount stated in the written order of the Owner authorizing the change in the work. The amount to be allowed the Contractor shall be the "cost" and "plus" the percentage or the specified maximum, whichever is the lesser amount.

The Contractor shall keep complete, accurate, daily record of the net actual cost of changes in the work, and shall present such information in such form and at such times as the Owner may request.

23. PATENTS

The Contractor shall pay all royalties and license fees and shall hold and save the Owner and his agent harmless from all liability of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the owner, unless otherwise specifically stipulated in the Contract Documents. In this respect, the Contractor shall defend all suits or claims for infringement of any patent or license right.

In the event that any claim, suit, or action at law or in equity of any kind, whatsoever, is brought against the Owner, involving any such patents or license rights, then the Owner shall have the right to, and may, retain from any money due or to become due to the Contractor, such sufficient sum as is considered necessary to protect said Owner, against loss, and such sum maybe retained by the Owner until such claim or suit shall have been settled and satisfactory evidence to that effect shall have been furnished the Owner.

24. "OR EQUAL" CLAUSE

Whenever, in any of the Contract Documents, material, or equipment is defined by describing a proprietary product, or by using the name of a manufacturer or vendor, the term "or equal," if not inserted, shall be implied. The specific article, material, or equipment mentioned shall be understood as indicating the type, function, minimum standard of design, efficiency, and quality desired and shall

not be construed in such a manner as to exclude manufacturers' products of comparable quality, design and efficiency. The Contractor shall comply with the requirements of the Contract Documents relative to the Owner's approval of materials and equipment before they are incorporated in the work.

25. CLEANING UP

The Contractor shall remove at his own expense from the Owner's property and from all public and private property, all temporary structures, rubbish and waste materials resulting from his operations. This requirement shall not apply to property used for permanent disposal of rubbish or waste materials in accordance with permission of such disposal granted to the Contractor by the Owner thereof.

26. USE OF COMPLETE PORTIONS OF THE WORK

The Owner may, at any time during progress of the work, after written notice to the Contractor, take over and place in service any completed portions of the work which are ready for service, although the entire work of the Contract is not fully completed, and notwithstanding the time for completion of the entire work or such portion may not have expired. In such event, the Contractor will be relieved of further work on or maintenance of said portion, except as covered by his guarantee of same.

27. PAYMENT WITHHELD

The Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate for progress payment to such extent as may be necessary to protect itself from loss on account of:

- A. Defective work not remedied.
- B. Claims filed or reasonable evidence indicating probable filing of claims.
- C. Failure of the contractor to make payments properly to subcontractors or for material or labor.
- D. A reasonable doubt that the Contract can be completed for the balance then unpaid.
- E. Damage to another contractor.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

28. CONTRACTOR'S RIGHT TO STOP WORK

If the work should be stopped under an order of any court, or other public authority for a period of three months, through no act or fault of the contractor or of anyone employed by him, or if the Owner should fail to pay to the Contractor within sixty days of its maturity and presentation any sum certified by the Engineer, provided no appeal is taken, the contractor may, upon seven days written notice to the Owner and the Engineer, stop work or terminate this Contract,, and shall receive from the Owner payment in full for all work executed, as determined from the prices contained in the approved detailed estimate as computed by the Engineer, but no claim for extra compensation or damages shall be made or allowed because of such termination of the Contract.

29. FAIR EMPLOYMENT PRACTICES ACT

The Contractor agrees that neither he nor his subcontractor will discriminate against any employee or applicant for employment, to be employed in the performance of this Contract, with respect to his hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment, because of his race, color, religion, national origin or ancestry. Breach of this covenant may be regarded as a material breach of this Contract.

30. AUTHORITY

No agent of the Owner shall have power to revoke, alter, enlarge, or relax the stipulation or requirements of these specifications, except insofar as such authority may be specifically conferred by the specifications themselves, without the formal authorization to do so, conferred by the Contract of which the specifications are a part, or by ordinance, resolution, or other usual official action by the Owner.

31. STARTING WORK

Material shall be ordered and work shall begin on the ground within thirty (30) days after the Contract is signed, unless otherwise stated.

32. SANITARY REGULATIONS

Necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed and maintained in sanitary condition by the Contractor, and their use shall be strictly enforced.

33. SUNDAY AND NIGHT WORK

The Contractor is required to prosecute work done under this Contract during the hours of daylight, and work will be permitted at night or on Sundays if it is in the best interest of the owner to accommodate traffic, service disruptions, and to keep the project on schedule. Contractor is required to get owner approval at least 48 hours prior to requesting night work. Also this provision is superseded if work is required to save property or life or as specifically authorized or directed by the Owner. Tunnel work may be prosecuted at night except on Sundays.

34. PROGRESS OF WORK

The work shall be prosecuted regularly and uninterruptedly, unless the Owner shall otherwise specifically direct, with such force and at such points as to insure its full completion within the time herein stated.

If, in the opinion of the Owner, it is necessary or advisable that certain portions of the work be done immediately, the Contractor, upon written order, shall proceed with such work without delay. Should he fail to so proceed, the Owner may do or cause to be done, such work, and the cost of the same will be deducted from any money due or to become due the Contractor under this Contract.

35. TIME OF COMPLETION

The time allowed for completion of the work contemplated in this Contract shall be as stated in the proposal or specifications.

36. EXTENSION OF TIME

All days in which work is suspended by order of the Owner, or in accordance with these specifications, shall automatically extend the time for completion an equal number of days.

37. TIME IS ESSENCE OF CONTRACT

It is distinctly understood and agreed to by the parties hereto that the time specified for the completion of the work is the essence of this Contract, and the Contractor shall not be entitled to claim performance of this agreement unless the work is satisfactorily completed, in every respect, within the time herein specified.

38. ESTIMATED QUANTITIES

The quantities of the various classes of work to be done and materials to be furnished under this Contract which have been estimated as stated elsewhere herein, are approximate and only for the purpose of comparing, on a uniform basis, the bids offered for the work under this Contract; and neither the Owner nor his agents is to be held responsible should any of the said estimated quantities be found incorrect during the construction of the work; and the Contractor shall make no claim for anticipated profit, nor for loss of profit, because of a difference between the quantities of the various classes of work actually done or materials actually delivered and the estimated quantities as herein stated.

39. FORFEITURE OF CONTRACT

If the work to be done under the Contract shall be abandoned by the Contractor, or if any time in the judgment of the Owner, the contractor shall fail to prosecute the work at a reasonable rate of progress, or to comply with all or any of the terms and requirements herein set forth, then the Owner shall have the right to take possession of the work, including Contractor's plant, supplies, and materials, at any time after having notified the Contractor in writing to discontinue the work under this Contract for said cause or causes, and such action shall not affect the right of the Owner to recover damages resulting from such failure. Upon receiving such notice, the Contractor shall and will, upon demand, immediately give the Owner to recover damages resulting from such failure. Upon receiving such notice, the Contractor shall and will, upon demand, immediately give the Owner safe and peaceable possession of the work,

including the plant, and shall then cease to have control over any portion thereof or the men employed thereon.

The Owner may then proceed to complete the work herein specified, by contract or otherwise; and the entire cost of the same shall be charged to the Contractor and deducted from any sum or sums due or to become due under the contract; the excess cost, if any, to be paid by the Contractor or his sureties, to said Owner.

40. NO WAIVER OF CONTRACT

Neither the acceptance of the whole or any part of the work by the Owner or his Engineer, or any of its agents, nor any order, measurements, or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for the whole or any part of the work by the Owner, nor any extension of time, nor any possession taken by the Owner or its agents, shall operate as a waiver for any portion of the Contract or any power therein provided; nor shall any waiver of any breach of the Contract be held to be a waiver of any other or subsequent breach.

41. PAYMENT NOT TO BE STOPPED

The Owner shall not, nor shall any officer thereof, be precluded or stopped by any return or certificate made or given by the Engineer, or other officer, agent or appointee, under the provisions of this agreement, at any time (either before or after the final completion and acceptance of the work and payment made therefor pursuant to any such return or certificates showing the true and correct amount of money due therefor, notwithstanding any such return or certificate, or any payment made in accordance therewith) from demanding and receiving from the Contractor or his sureties, separately or collectively, such sums as may have been improperly paid said Contractor by reason of any such return or certificate which has been untrue or incorrectly compiled.

42. GUARANTEE

The Contractor, as a condition precedent to final payment, shall execute a guarantee to the Owner warranting for a period of one year from the date of final payment to keep in good order and repair any defect in all the work done under the contract, either by the Contractor or his subcontractors, or the material suppliers, that may develop during said period due to improper materials, defective equipment, workmanship, or arrangements, and any other work affected in making good such imperfections shall also be made good, all without expense to the Owner, and the Contractor shall execute, in favor of the Owner, the attached Maintenance and Guarantee Bond.

When the specifications call for a guarantee period greater than one year, the Contractor shall provide such longer guarantee period.

43. ESTIMATES AND PAYMENTS

The Owner shall pay and the Contractor receive the prices bid in the proposal, or agreed upon, less any deduction for any uncompleted portion, based upon measurements made by the Engineer or as otherwise herein stipulated, and such measurements shall be final and conclusive.

As aid to the Owner in preparing estimates for progress payments, the Contractor may be required to submit to the Owner for approval a breakdown of some or all contract unit prices into their essential

component parts. The sum of the component parts shall not exceed the total contract price per unit and the breakdown shall not overrule the contract price per unit.

The Contractor shall submit to the Owner a written request for each payment and a Contractor's Declaration declaring that he has not performed any work, furnished any material, sustained any loss, damage or delay, for any reasons, including soil conditions encountered or created, or otherwise done anything for which he will ask, demand, sue for, or claim compensation from the Owner other than, as indicated on the Contractor's Declaration. When requested by the Owner, the Contractor shall submit receipts or other vouchers showing his payments for materials and labor, including payments to subcontractors.

Payments based on progress estimates will be made on a monthly basis for work completed during the preceding month or since the date of the last preceding progress payment. Payments will be in accordance with the provision of Act 524 of the Michigan Public Acts of 1980 and in accordance with the terms of this Contract. No allowance will be made for materials furnished which are not incorporated in the finished work, unless otherwise stated.

Partial Payment for materials and/or equipment stored on the jobsite may be allowed on the basis of 90% of the invoice cost of the material providing materials are properly stored. Partial Payment will be allowed on the basis of 90% of the invoice cost less the cost of delivery for materials and/or equipment stored off the jobsite providing the following conditions are met:

- Materials can be inspected by the OWNER and are clearly identifiable for the project.
- Items are properly stored in the opinion of the OWNER.
- Evidence of clear title transfer to the OWNER upon such partial payment can be provided.
- Insurance coverage against loss or damage is provided including certificates guaranteeing same.

Pursuant to Act 524, Michigan Public Acts of 1980, the Owner shall designate a person representing it to whom written requests for payments shall be submitted. The Contractor shall designate a person who shall submit written requests for payment to the Owner.

In the event a dispute arises over an avoidable or unacceptable delay in the performance of the work as described in Section 4(3) of Act 524 of Michigan Public Acts of 1980 [MCLA125.1564(3)], the dispute may, at the option of the Owner, be submitted for resolution in accordance with the provisions of Section 4 of Act 524 of the Michigan Public Acts of 1980 to an agent designated pursuant to Section 4(2) of the Act. The dispute resolution process described above shall be used only for the purpose of determining the rights of the parties to retained funds and interest earned on retained funds.

The Owner may withhold the payment of any estimate or portion of estimate until the Contractor shall have furnished satisfactory evidence that he has paid all claims of every nature.

No payment shall be considered as acceptance of the work or any portion thereof prior to the final completion of the work, and the payment of the final estimate.

Within thirty (30) days after the completion of the work under this Contract to the satisfaction of the Owner and the Engineer, in accordance with all and singular terms and stipulations herein contained, the Owner shall make final payment, from a final estimate made by the Engineer. Before final payment is made, the Contractor shall, as directed by the Owner,, furnish a Contractor's Affidavit that he has paid or satisfactorily secured all claims of every nature. Also, the Contractor shall furnish a release from the surety or sureties and permit agencies as applicable, approving payment of final estimate by the Owner.

The final payment, when made, shall be considered as final approval and acceptance of the completed work herein specified.

The acceptance by the Contractor of the final payment aforesaid shall operate as, and shall be, a release to the Owner and his agents, from all claim and liability to the Contractor for anything done or furnished for, relating to the work, or for any act or neglect of the Owner or of any person relating to or affecting the work.

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____
to _____ A.D., 20____, performed any work, furnished any material, sustained any loss, damage or
delay for any reason, including soil conditions encountered or created, or otherwise done anything for which I
shall ask, demand, due for, or claim compensation from _____

the Owner, or his agents, in addition to the regular items set forth in the contract numbered _____ and dated _____

A.D., 20____, for _____

executed between myself and the Owner, and in the Change Orders for work issued by the Owner in writing as
provided thereunder, except as I hereby make claim for additional compensation and/or extension of time as set
forth on the itemized statement attached hereto.

There (is) (is not) an itemized statement attached.

Date: _____

Company: _____

By: _____

Position: _____

CONTRACTOR'S AFFIDAVIT

STATE OF MICHIGAN)
)SS
County of)

The undersigned _____
hereby represents that on _____ he (it) was awarded a contract by _____
hereinafter called the Owner, to _____
_____, in accordance with the terms and conditions of Contract No. ____; and the undersigned
further represent that the subject work has now been accomplished and the said contract has now been completed.

The undersigned hereby warrants and certifies that all of his (its) indebtedness arising by reason of the said contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the said contract, have been fully paid or satisfactorily settled. The undersigned further agrees that if any such claim should hereafter arise, he (it) shall assume responsibility for the same immediately upon request to do so by the Owner.

The undersigned, for a valuable consideration, the receipt of which is hereby acknowledged, does further hereby waive, release and relinquish any and all claims or right of lien which the undersigned now has or may hereafter acquire upon the subject premises for labor and material used in accomplishing said project owned by the Owner.

This affidavit is freely and voluntarily given with full knowledge of the facts, on this ____ day of _____, 20__.

Company: _____

By: _____

Title: _____

Subscribed and sworn to before me, a Notary Public in and for _____ County, Michigan, on this ____ day of _____, 20__.

_____ Notary Public

My Commission Expires _____

Act No. 524

Public Acts of 1980

Approved by Governor

January 29, 1981

STATE OF MICHIGAN
80th LEGISLATURE
REGULAR SEASON OF 1980

Introduced by Rep. Ryan

ENROLLED HOUSE BILL NO. 5541

AN ACT to provide for the terms of certain construction contracts with certain public agencies; to regulate the payment and retainage of payments on construction contracts with certain public agencies; and to provide for the resolution of certain disputes.

The People of the State of Michigan enact:

Sec. 1. As used in this act:

(a) "Agent" means the person or persons agreed to or selected by the contractor and the public agency pursuant to section 4(2).

(b) "Architect or professional engineer" means an architect or professional engineer licensed under Act No. 299 of the Public Acts of 1980, being sections 339.101 to 339.2601 of the Michigan Compiled Laws, and designated by a public agency in a construction contract to recommend progress payments.

(c) "Construction contract" or "contract" means a written agreement between a contractor and a public agency for the construction, alteration, demolition, or repair of a facility, other than a contract having a dollar value less than \$30,000.00 or a contract that provides for 3 or fewer payments.

(d) "Contract documents" means the construction contract; instructions to bidders; proposal; conditions of the contract; performance bond; labor and material bond; drawings; specifications; all addenda issued before execution of the construction contract and all modifications issued subsequently.

(e) "Contractor" means an individual, sole proprietorship, partnership, corporation, or joint venture, that is a party to a construction contract with a public agency.

(f) "Facility" means a building, utility, road, street, boulevard, parkway, bridge, ditch, drain, levee, dike, sewer, park, playground, or other structure or work that is paid for with public funds or a special assessment.

(g) "Progress payment" means a payment by a public agency to a contractor for work in place under the terms of a construction contract.

(h) "Public agency" means this state, or a county, city township, village, assessment district, or other political subdivision, corporation, commission, agency, or authority created by law. However, public agency does not include the state transportation department, a school district, junior or community college, the Michigan state housing development authority created in Act No. 346 of the Public Acts of 1966, as amended, being sections 125.1401 to 125.1496 of the Michigan Compiled Laws, and a municipal electric utility or agency.

“Assessment district” means the real property within a district area upon which special assessments are levied or imposed or the construction, reconstruction, betterment, replacement, or repair of a facility to be paid for by funds derived from those special assessments imposed or levied on the benefited real property.

(i) “Retainage” or “retained funds” means the amount withheld from a progress payment to a contractor pursuant to Section 3.

Sec. 2. (1) The construction contract shall designate a person representing the contractor who will submit written requests for progress payments, and a person representing the public agency to whom requests for progress payments are to be submitted. The written requests for progress payments shall be submitted to the designated person in a manner and at such time as provided in the construction contract.

(2) The processing of progress payments by the public agency may be deferred by the public agency until work having a prior sequence, as provided in the contract documents, is in place and is approved.

(3) Each progress payment requested, including reasonable interest if requested under subsection (4), shall be paid within 1 of the following time periods, whichever is later:

(a) Thirty days after the architect or professional engineer has certified to the public agency that work is in place in the portion of the facility covered by the applicable request for payment in accordance with the contract documents.

(b) Fifteen days after the public agency has received the funds with which to make the progress payment from a department or agency of the federal or state government, if any funds are to come from either of those sources.

(4) Upon failure of a public agency 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.

Sec. 3. (1) To assure proper performance of a construction contract by the contractor, a public agency may retain a portion of each progress payment otherwise due as provided in this section.

(2) The retainage shall be limited to the following:

(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 public agency 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 public agency so determines, the public agency may retain not more than 10% of the dollar value of work more than 50% in place.

(3) The retained funds shall not exceed the pro rata share of the public agency’s matching requirement under the construction contract and shall not be commingled with other funds of the public agency 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 public agency which shall account for both retainage and interest on each construction contract separately. A public agency 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 public agency.

(4) Except as provided in Section 4(7) and (8), retainage and interest earned on retainage shall be released to a contractor together with the final progress payment.

(5) At any time after 94% of work under the contract is in place and at the request of the original contractor, the public agency shall release the retainage plus interest to the original contractor only if the original contractor provides to the public agency 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 public agency.

Sec 4. (1) The construction contract shall contain an agreement to submit those matters described in subsection (3) to the decision of an agent at the option of the public agency.

(2) If a dispute regarding a matter described in subsection (3) arises, the contractor and the public agency 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 public agency 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 agency.

(3) The public agency 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.

(4) 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.

(5) 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.

(6) 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, or other illegal means.

(7) If the dispute resolution results in a decision:

(a) That there has been a delay as described in subsection (3)(a), all interest earned on retained funds during the period of delay shall become the property of the public agency.

(b) That there has been unacceptable delay as described in subsection (3)(b), the public agency may contract with a subsequent contractor to complete the remaining 6% of work under the contract, and interest earned on retained funds shall become the property of the public agency. A subsequent contractor under this subdivision shall be paid by the public agency from the following sources until each source is depleted, in the order listed below:

(i) 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.

(ii) Retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(iii) Interest earned on retainage from the original contractor, or funds made available under a letter of credit provided under section 3(5).

(8) If the public agency contracts with a subsequent contractor as provided in subsection (7)(b), the final progress payment shall be payable to the original contractor the time period specified in section 2(3). The amount of the final progress payment to the original contractor shall not include interest earned on retained funds. The public agency may deduct from the final progress payment all expenses of contracting with the subsequent contractor. This act shall not impair the right of the public agency to bring an action or to otherwise enforce a performance bond to complete work under a construction contract.

Sec. 5. (1) Except as provided in subsection (2), this act shall apply only to a construction contract entered into after the effective date of this act.

(2) For a construction contract entered into before the effective date of this date, the provisions of this act may be implemented by a public agency, through a contract amendment, upon the written request of the contractor, with such consideration as the public agency considers adequate.

Sec. 6. This act shall take effect January 1, 1983.

Act No. 517
Public Acts of 2012
Approved by the Governor
December 28, 2012
Filed with the Secretary of State
December 28, 2012
EFFECTIVE DATE: April 1, 2013

**STATE OF MICHIGAN
96TH LEGISLATURE
REGULAR SESSION OF 2012**

Introduced by Senators Kahn, Marleau, Brandenburg, Anderson, Green and Booher

ENROLLED SENATE BILL No. 1024

AN ACT to prohibit persons who have certain economic relationships with Iran from submitting bids on requests for proposals with this state, political subdivisions of this state, and other public entities; to require bidders for certain public contracts to submit certification of eligibility with the bid; to require reports; and to provide for sanctions for false certification.

The People of the State of Michigan enact:

Sec. 1. This act shall be known and may be cited as the “Iran economic sanctions act”.

Sec. 2. As used in this act:

- (a) “Energy sector of Iran” means activities to develop petroleum or natural gas resources or nuclear power in Iran.
- (b) “Investment” means 1 or more of the following:
 - (i) A commitment or contribution of funds or property.
 - (ii) A loan or other extension of credit.
 - (iii) The entry into or renewal of a contract for goods or services.
- (c) “Investment activity” means 1 or more of the following:
 - (i) A person who has an investment of \$20,000,000.00 or more in the energy sector of Iran.
 - (ii) A financial institution that extends \$20,000,000.00 or more in credit to another person, for 45 days or more, if that person will use the credit for investment in the energy sector of Iran.
- (d) “Iran” means any agency or instrumentality of Iran.
- (e) “Iran linked business” means either of the following:
 - (i) A person engaging in investment activities in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers or products used to construct or maintain pipelines used to transport oil or liquefied natural gas for the energy sector of Iran.
 - (ii) A financial institution that extends credit to another person, if that person will use the credit to engage in investment activities in the energy sector of Iran.
- (f) “Person” means any of the following:
 - (i) An individual, corporation, company, limited liability company, business association, partnership, society, trust, or any other nongovernmental entity, organization, or group.
 - (ii) Any governmental entity or instrumentality of a government, including a multilateral development institution, as defined in section 1701(c)(3) of the international financial institutional act, 22 USC 262r(c)(3).

(275)

(iii) Any successor, subunit, parent company, or subsidiary of, or company under common ownership or control with, any entity described in subparagraph (i) or (ii).

(g) "Public entity" means this state or an agency or authority of this state, school district, community college district, intermediate school district, city, village, township, county, public authority, or public airport authority.

Sec. 3. (1) Beginning April 1, 2013, an Iran linked business is not eligible to submit a bid on a request for proposal with a public entity.

(2) Beginning April 1, 2013, a public entity shall require a person that submits a bid on a request for proposal with the public entity to certify that it is not an Iran linked business.

Sec. 4. If a public entity determines, using credible information available to the public, that a person has submitted a false certification under section 3(2), the public entity shall provide the person with written notice of its determination and of the intent not to enter into or renew a contract with the person. The notice shall include information on how to contest the determination and specify that the person may become eligible for a future contract with the public entity if the person ceases the activities that cause it to be an Iran linked business. The person shall have 90 days following receipt of the notice to respond in writing and to demonstrate that the determination of false certification was made in error. If a person does not make that demonstration within 90 days after receipt of the notice, the public entity may terminate any existing contract and shall report the name of the person to the attorney general together with information supporting the determination.

Sec. 5. The attorney general may bring a civil action against any person reported under section 4. If a civil action results in a finding that the person submitted a false certification, the person is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the public entity's investigation, and reasonable attorney fees, in addition to the fine. A person who submitted a false certification shall be ineligible to bid on a request for proposal for 3 years from the date the public entity determines that the person has submitted the false certification.

Sec. 6. The provisions of this act are effective only if Iran is a state sponsor of terror as defined under section 2 of the divestment from terror act, 2008 PA 234, MCL 129.292.

Enacting section 1. This act takes effect April 1, 2013.

This act is ordered to take immediate effect.

Carol Morey Viventi

Secretary of the Senate

Ray E. Randall

Clerk of the House of Representatives

Approved

.....
Governor

Statewide Prohibition Against Iran-Linked Businesses

The Michigan State legislature passed legislation to prohibit entities that have certain economic relationships with Iran from submitting a bid on a request for proposals (RFP) from state public entities, to require bidders for certain public contracts to submit certification of eligibility with a bid, and to respond to and report a false certification.

The "Iran Economic Sanctions Act" (P.A. 517 of 2012) makes an Iran-linked business ineligible to submit a bid on a RFP with a public entity. School districts, community college districts, and intermediate school districts must require each entity submitting a bid on an RFP to certify it is not an Iran-linked business. This requirement applies to all RFPs and not just to construction projects. Applicants for MDE grants will be required to assure compliance with this condition.

The Iran Economic Sanctions Act defines Iran-linked business as either of the following:

- A person engaging in investment activities in the energy sector of Iran, including a person who provides oil or liquefied natural gas tankers or products used to construct or maintain pipelines used to transport oil or liquefied natural gas for the energy sector of Iran.
- A financial institution that extends credit to another person, if that person will use the credit to engage in investment activities in the energy sector of Iran.

There are additional requirements to respond to and report an entity that has submitted a false certification. These requirements are described in the Iran Economic Sanction Act at: <http://www.legislature.mi.gov/documents/2011-2012/publicact/pdf/2012-PA-0517.pdf>

Provisions of the Iran Economic Sanction Act remain in effect as long as Iran is defined by the U.S. Secretary of State as a state sponsor of terror, a country determined to have repeatedly provided support for acts of international terrorism. Information about federal sanctions is available at: <http://www.state.gov/j/ct/list/c14151.htm>

Questions regarding the requirements of the Iran Economic Sanction Act may be directed to the Attorney General's office.

**VENDOR CERTIFICATION
THAT IT IS NOT AN
“IRAN LINKED BUSINESS”**

Pursuant to Michigan law, (*the Iran Economic Sanctions Act, 2012 PA 517, MCL 129.311 et seq.*), before accepting any bid or proposal, or entering into any contract for goods or services with any prospective Vendor, the Vendor must first certify that it is not an “IRAN LINKED BUSINESS, as defined by law.

Vendor	
Legal Name	
Street Address	
City	
State, Zip	
Corporate I.D. Number / State	
Taxpayer I.D. #	

The undersigned, with: 1) full knowledge of all of Vendors business activities, 2) full knowledge of the requirements and possible penalties under the law MCL 129.311 et seq. and 3) the full and complete authority to make this certification on behalf of the Vendor, by his/her signature below, certifies that: the Vendor is NOT an “IRAN LINKED BUSINESS” as required by MCL 129.311 et seq., and as such that Vendor is legally eligible to submit a bid and be considered for a possible contract to supply goods and/ or services to the Owner.

Signature of Vendor's
Authorized Agent:

Printed Name of Vendor's
Authorized Agent:

Witness Signature:

Printed Name of Witness:

SECTION 00800

GENERAL SUPPLEMENTARY CONDITIONS

PART 1 INSURANCE

1.1 Insurance Required of the Contractor

- A. 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, and the Engineer from claims arising out of the work described in this contract and performed by the Contractor, Subcontractor(s) or Sub-Subcontractor(s) consisting of the below listed policies.

1.2 Worker's Compensation Insurance

- A. Worker's Compensation insurance including Employer's Liability to cover employee injuries or disease compensable under the Workers' 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.
- B. Self-insurance plans approved by the regulatory authorities in the state in which work on this project is performed are acceptable.

1.3 Comprehensive General Liability

- A. 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:
 - 1. All premises and operations
 - 2. Explosion, collapse and underground damage
 - 3. Contractor's Protective coverage for independent contractors or subcontractors employed by him.
 - 4. Contractual Liability for the obligation assumed in the Indemnification or Hold Harmless agreement found hereinafter.
 - 5. The usual Personal Injury Liability endorsement with no exclusions pertaining to employment.
 - 6. Products and Completed Operations coverage. This coverage shall extend through the contract guarantee period.
- B. Additional Insured Requirements:
 - 1. Coverage shall be Primary and Non-contributory and Waiver of Subrogation applies.
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their council, members, Board members, public officials, consultants, agents, and employees
 - b. The "Engineer"
Hubbell, Roth & Clark, Inc.

Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.4 Comprehensive Automobile Liability

- A. 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 and including Michigan "No Fault" coverage.
- B. 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.
- C. Additional Insured Requirements:
 - 1. Coverage shall be Primary and Non-contributory
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their council, members, Board members, public officials, consultants, agents, and employees
 - b. The "Engineer"
Hubbell, Roth & Clark, Inc.
Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.5 Owner's & Contractors Protective Liability Policy

- A. The Contractor shall purchase for the Owner, a separate 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) or the Sub-Subcontractor(s) under this contract.
- B. Purchase the Owner's Protective Liability policy in the Owner's name.
- C. Additional Insured Requirements:
 - 1. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The "Engineer"
Hubbell, Roth & Clark, Inc.
Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.6 Builder's Risk-Installation Floater

- A. 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 insured, (a) the Contractor, (b) all Subcontractors, (c) all Sub-Subcontractors, (d) the Owner, and the Engineer, 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).

- B. Coverage shall be effected on an "All Risk" form including, but not limited to, the Perils of fire, wind, flood, vandalism, collapse, theft and earthquake, with exclusions normal to the cover.
- C. The Contractor may arrange for such deductibles as he deems to be within his ability to self-assume, but he will be held solely responsible for the amount of such deductible and for any coinsurance penalties.
- D. Any insured loss shall be adjusted with the Owner and the Contractor and paid to the Owner and Contractor as trustee for the other insured.
- E. Additional Insured Requirements:
 - 1. Coverage shall be Primary and Non-contributory
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their council, members, Board members, public officials, consultants, agents, and employees
 - b. The "Engineer"
Hubbell, Roth & Clark, Inc.
Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.7 Umbrella or Excess Liability

- A. 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.
- B. 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.
- C. Additional Insured Requirements:
 - 1. Coverage shall be Primary and Non-contributory and Waiver of Subrogation applies.
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their council, members, Board members, public officials, consultants, agents, and employees
 - b. The "Engineer"
Hubbell, Roth & Clark, Inc.
Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.8 Railroad Protective Liability

- A. Where such an exposure exists, as determined by the Owner, 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.
- B. Additional Insured Requirements:
1. Coverage shall be Primary and Non-contributory and Waiver of Subrogation applies.
 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their council, members, Board members, public officials, consultants, agents, and employees
 - b. The "Engineer"
Hubbell, Roth & Clark, Inc.
Bloomfield Hills, Michigan
Their owners, directors, officers, consultants, agents, and employees

1.9 Limits of Liability

- A. The required limits of liability for insurance coverage shall be **not less than** the following:
1. Workers' Compensation
Coverage A - Compensation Statutory
Coverage B - Employer's Liability \$500,000
 2. Comprehensive General Liability
Bodily Injury and Property Damage \$1,000,000 Each Occurrence
Combined Single Limit \$2,000,000 Per Job Aggregate
..... \$1,000,000 Completed Operations Aggregate
 3. Comprehensive Automobile Liability
Bodily Injury and Property Damage \$1,000,000 Each Accident
Combined Single Limit
 4. Owner's Protective
Bodily Injury and Property Damage \$1,000,000 Per Occurrence
Combined Single Limit \$1,000,000 Aggregate
 5. Builder's Risk & Installation Floater Cost to replace at time of loss
 6. Umbrella or Excess Liability \$2,000,000 Per Occurrence
..... \$2,000,000 Aggregate
 7. Insurance - Other Requirements
 - a. Notice of Cancellation or Intent Not to Renew: Policies will be endorsed to provide that at least 30 days written notice shall be given to the Owner and to the Engineer, of cancellation of, material change, or intent not to renew (see sample endorsements which follow this Section).

1.10 Evidence of Coverage

- A. 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.
- B. Other forms of Certificate are acceptable only if (1) they include all of the items prescribed in the Owner's Form of Certificate, including agreement to cancellation provisions outlined

herein, (2) the Engineer's Project Identification Number, and (3) they have written approval of the Owner and the Engineer.

- C. The Owner reserves the right to request complete copies of policies if deemed necessary to ascertain details of coverage not provided by certificates.
- D. Such policy copies shall be "Originally Signed Copies," and so designated.
 - 1. Insurance Required for the Contractor
 - a. Workers' Compensation and Employers' Liability
 - b. Comprehensive General Liability-including:
 - 1) All premises and operations.
 - 2) Explosion, collapse and underground damage.
 - 3) Contractor's Protective.
 - 4) Contractual Liability for obligations assumed in the Indemnification-Hold Harmless Agreement of this Contract.
 - 5) Personal Injury Liability.
 - 6) Products and Completed Operations
 - c. Comprehensive Automobile Liability - including owned, non-owned and hired vehicles and Michigan "No Fault" coverage.
 - d. Umbrella or Excess Liability.
 - e. Builders Risk Installation Floater
 - f. Railroad Protective Liability
 - 2. Insurance Required for the Owner
 - a. Owners' and Contractor's Protective Liability Policy which names as additionally insured the Engineer, their consultants, agents, employees and such public corporations in whose jurisdiction the work is located.
 - b. Refer to sample endorsements which follow this Section.

1.11 Qualification of Insurers

- A. 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 no lower than XI and a policyholder's service rating no lower than A as listed in A. M. Best's Key Rating Guide, current edition.
- B. Companies with ratings lower than A;XI will be acceptable only upon written consent of the Owner.

1.12 Contract Security

- A. If the Owner is a public entity, the Contractor shall furnish a surety bond (form attached) in an amount at least equal to 100 percent of the contract price as security for the faithful performance of this contract. The Contractor shall furnish, also, a separate surety bond (form attached) in an amount at least equal to 100 percent of the contract price as security for the payment of all persons performing labor on the project under this contract, and furnishing materials in connection with this contract. The surety on each such bond shall be a duly authorized surety company satisfactory to the Owner.
- B. Regardless of whether the Owner is or is not a public entity, the Contractor shall furnish a Maintenance and Guarantee Bond (form attached) covering all work under this contract. The

guarantee is to cover a period of one year subsequent to the date of the final estimate, unless otherwise specified.

- C. Surety Companies providing and executing Surety and Guarantee Bonds shall appear on the United States Treasury Departments most current list, Circular 570, as holding certificates of authority as acceptable sureties on federal bonds. The penal sum of such bonds shall not exceed the a company's limitation as stated therein. A surety company shall be licensed in the State in which it provides a bond and in the State where the contract work is to be performed.

1.13 Indemnification

- A. The contractor agrees to indemnify, defend, and save harmless the Owner and the Engineer, their consultants, agents, and employees, from and against all loss or expense (including costs and attorney's fees) by reason of liability imposed by law upon the Owner and the Engineer, their consultants, agents, and employees for damages because of bodily injury, including death at any time resulting there from, sustained by any person or persons or on account of damage to property, including loss of use thereof, arising out of or in consequence of the performance of this work, whether such injuries to persons or damage to property is due, or claimed to be due, to the negligence of the contractor, his subcontractors, the Owner, the Engineer, and their consultants, agents, and employees, **except** only such injury or damage as shall have been occasioned by the sole negligence of the Owner, the Engineer, or their agents, employees or consultants.
- B. The Contractor also agrees to indemnify, defend and save harmless the Owner and the Engineer, their owners, directors, Board members, officers, directors, officials, and council members, consultants, agents and employees, from and against any and all loss or expense (including costs and attorney's fees) for any and all claims or allegations of supervision, inspection or observation activities or services which may arise out of, or in consequence of, the performance of this work.

PART 2 PART 2 – NOT USED

PART 3 PART 3 – NOT USED

END OF SECTION

Client#: 7782		PAV/COR	
ACORD™ CERTIFICATE OF LIABILITY INSURANCE			DATE (MM/DD/YYYY) 04/02/2015
<p>THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.</p> <p>IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).</p>			
PRODUCER Insurance Agency 24724 Any Street (248) 666-6666 P.O. Box 2067 SomeCity, MI 48037-2067		CONTACT NAME: Insurance Agent name PHONE (A/C, No, Ext): 248 555-5555 FAX (A/C, No, Ext): 248 111-1111 E-MAIL ADDRESS: InsuranceAgent@InsuranceGroup.com PRODUCER CUSTOMER ID #:	
INSURED Company ABC 2654 Street Name AnyCity, MI 48183		INSURER(S) AFFORDING COVERAGE INSURER A : Insurance Company 1 INSURER B : Insurance Company 2 INSURER C : INSURER D : INSURER E : INSURER F :	
COVERAGES		CERTIFICATE NUMBER:	
REVISION NUMBER:			
<p>THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.</p>			
INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> X,C,U <input checked="" type="checkbox"/> Contractual GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	X X	MPA00000042433S
			POLICY EFF (MM/DD/YYYY) 11/17/2014
			POLICY EXP (MM/DD/YYYY) 11/17/2015
			LIMITS
			EACH OCCURRENCE \$1,000,000
			DAMAGE TO RENTED PREMISES (Ea occurrence) \$100,000
			MED EXP (Any one person) \$5,000
			PERSONAL & ADV INJURY \$1,000,000
			GENERAL AGGREGATE \$2,000,000
			PRODUCTS - COM/PROP AGG \$2,000,000
			\$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS <input checked="" type="checkbox"/> Drive Other Car	X X	BA00000042434S
			POLICY EFF (MM/DD/YYYY) 11/17/2014
			POLICY EXP (MM/DD/YYYY) 11/17/2015
			LIMITS
			COMBINED SINGLE LIMIT (Ea accident) \$1,000,000
			BODILY INJURY (Per person) \$
			BODILY INJURY (Per accident) \$
			PROPERTY DAMAGE (Per accident) \$
			\$
			\$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DEDUCTIBLE RETENTION \$	X X	CMB00000042435S
			POLICY EFF (MM/DD/YYYY) 11/17/2014
			POLICY EXP (MM/DD/YYYY) 11/17/2015
			LIMITS
			EACH OCCURRENCE \$2,000,000
			AGGREGATE \$2,000,000
			\$
			\$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y / N N / A	WC0001100555
			POLICY EFF (MM/DD/YYYY) 05/01/2014
			POLICY EXP (MM/DD/YYYY) 04/30/2015
			LIMITS
			WC STATU-TORY LIMITS \$
			OTH-ER \$
			E.L. EACH ACCIDENT \$500,000
			E.L. DISEASE - EA EMPLOYEE \$500,000
			E.L. DISEASE - POLICY LIMIT \$500,000
A	Installation Floater	X	MPA00000042433S
			POLICY EFF (MM/DD/YYYY) 11/17/2014
			POLICY EXP (MM/DD/YYYY) 11/17/2015
			LIMITS
			\$150,000
			\$1,000 deductible
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required) Municipality Name, their council, members, board members, public officials, consultants, agents, and (Please refer to attached Endorsements evidencing the change of policy.)			
CERTIFICATE HOLDER		CANCELLATION	
Municipality Name 18500 Street Name AnyCity, MI 48025		SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE	
		SIGNATURE	

DESCRIPTIONS (Continued from Page 1)

employees, as well as the engineer; Hubbell Roth & Clark, their owners, directors, officers, consultants, agents, and employees are included as Additional Insured per written contract with respect to the general, auto and umbrella liability coverages for the work performed by the named insured for the certificate holder. Insurance is considered primary and non contributing and a waiver of subrogation applies. Should any of the above described policies be cancelled before the expiration date thereof, the issuing Company will mail 30 days prior written notice to the Certificate holder. Endorsements evidencing the change of Policy are attached.

Example only

POLICY NUMBER: TRA 4820287

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**EARLIER NOTICE OF CANCELLATION
PROVIDED BY US**

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE PART
CRIME AND FIDELITY COVERAGE PART
EQUIPMENT BREAKDOWN COVERAGE PART
FARM COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL LIABILITY UMBRELLA COVERAGE PART
OWNERS AND CONTRACTORS PROTECTIVE LIABILITY COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
PROFESSIONAL LIABILITY COVERAGE

SCHEDULE

Number of Days' Notice 30

<u>Name Of Additional Insured Person(s) Or Organization(s)</u>	<u>Location(s) Of Covered Operations</u>

(If no entry appears above, information required to complete this Schedule will be shown in the Declarations as applicable to this endorsement.)

For any statutorily permitted reason other than nonpayment of premium, the number of days required for notice of cancellation, as provided in paragraph 2. of either the CANCELLATION Common Policy Condition or as amended by an applicable state cancellation endorsement, is increased to the number of days shown in the Schedule above.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 37 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – COMPLETED OPERATIONS**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

COMMERCIAL GENERAL LIABILITY
CG 20 33 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – AUTOMATIC STATUS WHEN
REQUIRED IN CONSTRUCTION AGREEMENT WITH YOU**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

A. Section II – Who Is An Insured is amended to include as an additional insured any person or organization for whom you are performing operations when you and such person or organization have agreed in writing in a contract or agreement that such person or organization be added as an additional insured on your policy. Such person or organization is an additional insured only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured.

However, the insurance afforded to such additional insured:

1. Only applies to the extent permitted by law; and
2. Will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

A person's or organization's status as an additional insured under this endorsement ends when your operations for that additional insured are completed.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to:

1. "Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of, or the failure to render, any professional architectural, engineering or surveying services, including:

- a. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
- b. Supervisory, inspection, architectural or engineering activities.

This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the "occurrence" which caused the "bodily injury" or "property damage", or the offense which caused the "personal and advertising injury", involved the rendering of or the failure to render any professional architectural, engineering or surveying services.

2. "Bodily injury" or "property damage" occurring after:

- a. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
- b. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

C. With respect to the insurance afforded to these additional insureds, the following is added to

Section III – Limits Of Insurance:

The most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement you have entered into with the additional insured; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

Example only

COVERAGES		LIMITS		
TYPE OF INSURANCE	COVERAGE/FORMS	DEDUCTIBLE	COINS %	AMOUNT
PROPERTY CAUSES OF LOSS				
<input type="checkbox"/> BASIC <input checked="" type="checkbox"/> BROAD <input type="checkbox"/> SPEC _____ _____				
GENERAL LIABILITY	Owners & Contractors Protective Liability	EACH OCCURRENCE		\$ 1,000,000
COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR X OCP _____ _____	RETRO DATE FOR CLAIMS MADE:	DAMAGE TO RENTED PREMISES		\$
		MED EXP (Any one person)		\$
		PERSONAL & ADV INJURY		\$
		GENERAL AGGREGATE		\$ 1,000,000
		PRODUCTS - COMP/O/P AGG		\$
AUTOMOBILE LIABILITY		COMBINED SINGLE LIMIT		\$
<input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS		BODILY INJURY (Per person)		\$
		BODILY INJURY (Per accident)		\$
		PROPERTY DAMAGE		\$
		MEDICAL PAYMENTS		\$
		PERSONAL INJURY PROT		\$
		UNINSURED MOTORIST		\$
				\$
AUTO PHYSICAL DAMAGE DEDUCTIBLE	<input type="checkbox"/> ALL VEHICLES <input type="checkbox"/> SCHEDULED VEHICLES	ACTUAL CASH VALUE		
<input type="checkbox"/> COLLISION: <input type="checkbox"/> OTHER THAN COL:		STATED AMOUNT		\$
		OTHER		\$
GARAGE LIABILITY		AUTO ONLY - EA ACCIDENT		\$
<input type="checkbox"/> ANY AUTO <input type="checkbox"/> <input type="checkbox"/>		OTHER THAN AUTO ONLY:		
		EACH ACCIDENT		\$
		AGGREGATE		\$
EXCESS LIABILITY		EACH OCCURRENCE		\$
<input type="checkbox"/> UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM	RETRO DATE FOR CLAIMS MADE:	AGGREGATE		\$
		SELF-INSURED RETENTION		\$
WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY		WC STATUTORY LIMITS		
		E.L. EACH ACCIDENT		\$
		E.L. DISEASE - EA EMPLOYEE		\$
		E.L. DISEASE - POLICY LIMIT		\$
SPECIAL CONDITIONS/OTHER COVERAGES	Named Insured to include: Owners Name & the Engineer, their (See attached Spec Conditions/Other Covs page.)	FEES		\$
		TAXES		\$
		ESTIMATED TOTAL PREMIUM		\$

ACORD 75 (2001/01) 1 of 3 #5069 NOTE: IMPORTANT STATE INFORMATION ON REVERSE SIDE MSB © ACORD CORPORATION 1993

CONDITIONS

This Company binds the kind(s) of insurance stipulated on the reverse side. The Insurance is subject to the terms, conditions and limitations of the policy(ies) in current use by the Company.

This binder may be cancelled by the Insured by surrender of this binder or by written notice to the Company stating when cancellation will be effective. This binder may be cancelled by the Company by notice to the Insured in accordance with the policy conditions. This binder is cancelled when replaced by a policy. If this binder is not replaced by a policy, the Company is entitled to charge a premium for the binder according to the Rules and Rates in use by the Company.

Applicable in California

When this form is used to provide insurance in the amount of one million dollars (\$1,000,000) or more, the title of the form is changed from "Insurance Binder" to "Cover Note".

Applicable in Delaware

The mortgagee or Obligee of any mortgage or other instrument given for the purpose of creating a lien on real property shall accept as evidence of insurance a written binder issued by an authorized insurer or its agent if the binder includes or is accompanied by: the name and address of the borrower; the name and address of the lender as loss payee; a description of the insured real property; a provision that the binder may not be canceled within the term of the binder unless the lender and the insured borrower receive written notice of the cancellation at least ten (10) days prior to the cancellation; except in the case of a renewal of a policy subsequent to the closing of the loan, a paid receipt of the full amount of the applicable premium, and the amount of insurance coverage.

Chapter 21 Title 25 Paragraph 2119

Applicable in Florida

Except for Auto Insurance coverage, no notice of cancellation or nonrenewal of a binder is required unless the duration of the binder exceeds 60 days. For auto insurance, the insurer must give 5 days prior notice, unless the binder is replaced by a policy or another binder in the same company.

Applicable in Nevada

Any person who refuses to accept a binder which provides coverage of less than \$1,000,000.00 when proof is required: (A) Shall be fined not more than \$500.00, and (B) is liable to the party presenting the binder as proof of insurance for actual damages sustained therefrom.

SPECIAL CONDITIONS/OTHER COVERAGES (Cont. from page 1)

consultants, agents, employees,
& such public corporations in whose jurisdiction the work is located.

** Continued From Additional Interests Section **

Hubbell, Roth & Clark, Inc.
555 Hulet Drive; P.O. Box 824
Bloomfield Hills, MI 48303-0824
Type: Additional Insured

Example only

COMMERCIAL GENERAL LIABILITY
CG 20 31 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – ENGINEERS,
ARCHITECTS OR SURVEYORS**

This endorsement modifies insurance provided under the following:

OWNERS AND CONTRACTORS PROTECTIVE LIABILITY COVERAGE PART

A. **Section II – Who Is An Insured** is amended to include as an additional insured any architect, engineer or surveyor engaged by you, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf:

1. In connection with your premises; or
2. In the performance of your ongoing operations.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusion applies:

This insurance does not apply to "bodily injury" or "property damage" arising out of the rendering of or the failure to render any professional services by or for you, including:

1. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or

2. Supervisory, inspection, architectural or engineering activities.

This exclusion applies even if the claims against any insured allege negligence or other wrongdoing in the supervision, hiring, employment, training or monitoring of others by that insured, if the "occurrence" which caused the "bodily injury" or "property damage" involved the rendering of or the failure to render any professional services by or for you.

C. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance**:

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

SECTION 01000

GENERAL SPECIFICATIONS

1.1	WORKING SPACE.....	1
1.2	WORK WITHIN PUBLIC STREETS OR LAND.....	2
1.3	EASEMENTS.....	2
1.4	LOCATING WORK.....	2
1.5	SOIL CONDITIONS	2
1.6	SURVEY MONUMENTS.....	2
1.7	TRENCH BACKFILL.....	3
1.8	MAINTENANCE AND RESTORATION OF PAVEMENTS, ROAD SURFACES, STRUCTURES AND TRENCH BACKFILL	4
1.9	ROAD PERMITS	4
1.10	ROAD DETOURS.....	5
1.11	PROTECTION OF THE PUBLIC	5
1.12	BARRICADES AND PROTECTION.....	5
1.13	MAINTENANCE OF TRAFFIC	5
1.14	PRESERVATION OF TREES	6
1.15	REPLACEMENT OF SHRUBBERY	6
1.16	SODDING	6
1.17	FINAL CLEANUP, GRADING, TOP SOIL AND SEEDING.....	7
1.18	EXISTING STRUCTURES AND UTILITIES.....	7
1.19	PUBLIC AND PRIVATE UTILITIES.....	7
1.20	PUMPING, BAILING AND DRAINING.....	8
1.21	SHEETING, SHORING AND BRACING	9
1.22	DISPOSAL OF EXCAVATED MATERIAL	9
1.23	DISPOSAL OF WASTE MATERIALS.....	9
1.24	TUNNELING	9
1.25	COMPRESSED AIR	9
1.26	EXPLOSIVES	9
1.27	INSPECTION OF PREMISES.....	10
1.28	SCHEDULE OF OPERATIONS	10
1.29	ORDINANCES AND CODES.....	10
1.30	REQUIREMENTS PERTAINING TO WORK WITHIN RAILROAD RIGHTS-OF-WAY.....	10
1.31	TRAFFIC CONTROL	11
1.32	DUST CONTROL	11
1.33	INCONVENIENCES	11

1.1 WORKING SPACE

- A. The contractor shall interfere as little as possible with traffic and in all cases shall confine the work operations to the minimum space possible.
- B. Stockpiling of construction material and equipment will be permitted as necessary, but in no case shall traveled roadways, driveways, or entrances be unduly obstructed.

- C. Should storage areas be desired on private property, the Contractor may obtain such space on privately owned property at his own expense, by agreement with the property owner thereof. The Contractor shall provide the Owner with a copy of the written permission from the private property owner prior to occupying the property.

1.2 WORK WITHIN PUBLIC STREETS OR LAND

- A. Where the centerline of the proposed improvement is within the public street or land, the contractor shall confine his operations to within the public street or land unless easements have been acquired (See "Easements"). It shall be the contractor's responsibility to use such methods and/or materials, including sheeting, so as to prevent any portion of the excavation from encroaching on private property. This shall not preclude the contractor from obtaining the right to encroach on private land in accord with the foregoing article "Working Space." All signing and barricading shall be done in accordance with current edition of the Michigan Manual of Uniform Traffic Control Devices (M.M.U.T.C.D.) as issued by the Michigan Department of Transportation.

1.3 EASEMENTS

- A. In certain instances the owner may have acquired certain permanent easements and construction easements for the contractor's use in constructing the work. The contractor shall confine work operations to these easements except as noted under the foregoing article "Working Space."

1.4 LOCATING WORK

- A. The contractor shall accurately locate the work from reference points established by the Owner along the surface of the ground and the line of work. For sewers, "cut sheets" will be furnished by the Owner. Reference points shall be protected and preserved by the contractor.

1.5 SOIL CONDITIONS

- A. The contractor, as such and as bidder, shall make his own determination as to soil and/or rock conditions and shall complete the work in whatever material and under whatever conditions may be encountered or created, without extra cost to the owner. This shall apply whether or not borings are shown on the drawings.
- B. The owner does not guarantee that the ground encountered during construction will conform with any boring information furnished herein.
- C. The Owner and Engineer may have been involved in the design, construction observation, and/or construction of other underground projects in the area of the proposed construction. The observation field reports, soil reports, and any soil information connected with these projects are available for review by the prospective bidders.

1.6 SURVEY MONUMENTS

- A. Monuments or other recognized property boundary markers at street intersections, section corners, acreage or lot corners, and right-of-way lines shall be preserved and protected. Where such monuments or markers must be removed during construction, the Owner shall be

notified and the Contractor shall make all necessary arrangements with a land surveyor registered in the State of Michigan to have these monuments or markers properly witnessed prior to disturbance or removal and later reset by the registered land surveyor at no cost to the Owner.

1.7 TRENCH BACKFILL

- A. The Contractor, as such and as bidder, shall carefully review the contract drawings and specifications and shall determine the extent of the "Special Backfill" requirements. The cost of providing for and meeting the requirements for Special Backfill shall be included in the unit price of the work as bid at no extra cost to the Owner.
- B. Special backfill shall be used at all locations and of the type called for on the drawings, and at other locations specified herein whether called for on the drawings or not.
- C. The type and method of backfilling is dependent on its locations and function and shall conform with the following requirements. The owner will supply field observation on the special backfill compaction requirements.
- D. Backfilling of trenches in the shoulder area and under private gravel drives shall be carried to within 6 inches of the existing surface as specified under Trench A or Trench B as required. The shoulder shall be defined herein as the area within ten feet of the pavement edge, or the width of the existing graveled shoulder, whichever is the lesser. The remaining depth shall be backfilled with 6 inches of compacted 21AA aggregate. Backfilling of trenches crossing gravel roads or streets shall be carried to within 8 inches of the existing surface and the remaining depth shall be backfilled with 8 inches of compacted 21AA limestone aggregate. Compaction shall be performed by a pneumatic-tired roller or a vibratory compactor until the compaction requirements as required for Trench A or Trench B and as detailed in the following paragraphs are met.
- E. The requirements as specified herein are in addition to the conditions provided for under permit granted by the Board of County Road Commissioners of the County or the Michigan Department of Transportation.
- F. Trench A
 - 1. All trenches under graveled, slag or hard surfaced roads, pavements, hard surfaced parking lots and driveways, sidewalks, curbs and where the trench edge is within 3 feet of a pavement shall be backfilled with bank run sand meeting the requirements of Granular Material, MDOT Class II. The material shall be placed by the Controlled Density Method or other effective means having the approval of the Engineer and is to be compacted to 95 percent of maximum unit weight as determined by ASTM D-1557 Modified Proctor. Trenches under pavement to be constructed in the near future, as noted or shown on the drawings, shall be backfilled with MDOT Class II Granular Material, meeting the requirements of Table 902-3 Grading Requirements for Granular Materials 1996 in the MDOT 1996 Standard Specifications for Construction.
- G. Trench B
 - 1. Trench B shall be used where called for on the drawings and where the trench crosses slag or gravel drives, shoulders, or parking lots whether called for on the drawings or not.

- H. All trenches shall be backfilled with granular material, MDOT Class II to a point 12 inches above the pipe for diameters less than 24 inches and up to the spring line with materials meeting the requirements of the 1996 MDOT Table 902-2, Class 34R for diameters 24 inches or larger. This portion of the backfill is to be placed in layers not exceeding 6 inches in depth, and shall be thoroughly compacted by mechanical tamping to not less than 95% of maximum unit weight utilizing ASTM D-1557 Modified Proctor. The remainder of the backfill shall be made with suitable excavated material (excluding blue and gray clays, peat, muck, marl or other organic materials) placed in one foot layers with each layer being thoroughly compacted by approved mechanical methods, or other effective means having the approval of the Engineer, to a density of 90% of maximum unit weight utilizing ASTM D-1557 Modified Proctor.

1.8 MAINTENANCE AND RESTORATION OF PAVEMENTS, ROAD SURFACES, STRUCTURES AND TRENCH BACKFILL

- A. Where trenches cross existing improved roadways or drives or where the trench parallels an existing improved roadway which is disturbed by the contractor's operations, the contractor shall consolidate the trench backfill and shall place a temporary gravel fill, meeting 21AA Aggregate Gradation or (County Road Specifications) at least 8" thick; and shall, during the life of the contract, maintain the same in good condition with additional gravel as settling takes place. All structures, including curbing, walks, paving, gravel, or street road surfaces, etc., that may be damaged or destroyed by the contractor's operations, shall be repaired and replaced by him at his own expense. In restoring pavement, a saw shall be used and a cut equal to at least 3/4 of the thickness of the existing pavement shall be made on each side of the part to be restored, with the exception of expansion joints that shall be saw cut the full depth of the pavement. Concrete shall be 3500 psi, using six (6) sacks of cement per cubic yard of concrete, unless otherwise required.
- B. If the pavement removed had an asphaltic concrete surface, the surface shall be removed to a distance one foot beyond the limits of the removed concrete pavement. The butt joint in asphaltic concrete removal shall be prepared by sawing through the total depth of asphaltic concrete. The surface shall be replaced with a nominal two inches of MDOT bituminous surface mixture as required by the Owner and meeting the requirements of the Michigan Department of Transportation as to materials and method of replacement at no extra cost to the Owner.
- C. Trenches shall be backfilled to the requirement of "Trench A" or "Trench B" specifications as described in this section and as specified on plans and profiles. After completion of backfill, the work area shall be restored as noted under "Final Cleanup - Grading, Topsoil, and Seeding and/or Sodding".

1.9 ROAD PERMITS

- A. The contractor shall obtain any necessary construction permits required of contractors for work within public streets, highways, roads, or alleys. The cost of construction permits, including, but not limited to, inspection fees, application fees, and/or review fees that may be required in connection with such permits, shall be at the Contractor's expense. Construction operations shall be conducted in accordance with provisions of such permits, including tunneling of pavements where required. The cost of any required bonds shall be included in the cost of the work as bid.

1.10 ROAD DETOURS

- A. The contractor shall provide and maintain all temporary roadways as required for work operations or as required under "Road Permits" or otherwise specified or shown on the drawings at no extra cost to the Owner.

1.11 PROTECTION OF THE PUBLIC

- A. The contractor shall provide sufficient barricades, guard railings, fencing, advance construction signing, coverings or other means to protect the public from injury due to the work operations, including completed or uncompleted work, at all times until acceptance of the work by the Owner at no extra cost to the Owner.

1.12 BARRICADES AND PROTECTION

- A. The contractor shall provide and maintain in good repair, all barricades, guard railings, etc., as required for the protection of the workers, the Owner's employees and employees of Owner's agent in strict compliance with state and local requirements.
- B. At dangerous points throughout the work, the contractor shall provide and maintain guard rails, colored lights, and flags. All possible precautions shall be taken to protect the workers from injury at no extra cost to the Owner.

1.13 MAINTENANCE OF TRAFFIC

- A. During the progress of the work, the contractor shall accommodate both vehicular and pedestrian traffic as provided in these specifications and as indicated on the drawings. In the absence of specific requirements, traffic shall be maintained in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices. Access to fire hydrants and water valves shall always be maintained. The contractor's truck and equipment operations on public streets shall be governed by County regulations, all local traffic ordinances, and regulations of the Fire and Police Department.
- B. Small street openings necessary for manholes, alignment holes, sewer connections, etc. will be permitted. Such holes shall not be open longer than necessary and shall be protected and any traffic detouring necessary shall be done to the satisfaction of the Owner. Wherever possible, small openings shall be covered with steel plates at pavement level secured in place during periods that work is not being performed at no extra cost to the Owner.
- C. Where streets are partially obstructed, the contractor shall place and maintain temporary driveways, ramps, bridges and crossings which in the opinion of the Owner are necessary to accommodate the public at no extra cost to the Owner. In the event of the contractor's failure to comply with the foregoing provisions, the Owner may, with or without notice, cause the same to be done and deduct the cost of such work from any monies due or to become due the contractor under this contract. However, the performance of such work by the Owner, or at his insistence, shall serve in no way to release the contractor from his liability for the safety of the traveling public.
- D. The contractor shall provide flagmen, warning lights, signs, fencing and barricades necessary to direct and protect vehicular and pedestrian traffic at no extra cost to the Owner.

- E. The contractor shall inform the local fire department in advance of work operations of street obstructions and detours, so that the fire department can set up plans for servicing the area in case of an emergency. The governing police department and the owner shall be notified at least one week prior to obstructing any street.

1.14 PRESERVATION OF TREES

- A. The contractor shall protect and preserve all trees along the line of work, and will be held responsible for any damage to trees. Where necessary to preserve a tree and its main roots, the contractor shall tunnel under such tree. Where specifically called for on the drawings, the contractor shall remove trees completely, including stumps and main roots.
- B. Where tunneling is not required for trees close to the trench and root trimming is necessary, the contractor shall hand trench ahead of the machine digging and cut all roots cleanly to minimize damage to the roots.
- C. Tree branches shall be tied back to protect them from the contractor's machinery.
- D. When a tree is removed by the contractor for his convenience and with the permission of the Owner and the adjacent property owner (where required), the contractor shall furnish one three (3) inch dia. tree for every six (6) inches of diameter of the tree removed. The species shall be as directed by the Owner. All trees installed shall be guaranteed to grow for a period of one (1) year.
- E. The contractor will receive no extra compensation for preservation of trees or for their removal and replacement where called for, and the cost of all work involved shall be included in the unit price bid or at no extra cost to the owner.

1.15 REPLACEMENT OF SHRUBBERY

- A. The contractor shall protect and/or replace all shrubbery damaged or destroyed by operations under this contract at no extra cost to the owner.

1.16 SODDING

- A. Where called for in the specifications, or on the drawings, the contractor shall furnish all labor and material and place Grade A sod to the finished grade shown or to conform with existing grades and provide a smooth and uniform surface to meet existing ground surface.
- B. Sod shall be densely rooted blue grass or other approved perennial grasses, free from noxious weeds and reasonably free from other weeds. Sod shall be not less than 2 inches thick, cut in strips not less than 10 inches wide by 18 inches long. The type of grass shall match the adjacent lawn.
- C. The area to be sodded shall be made smooth and shall be covered with not less than 2 inches of approved top soil screened to remove all debris uniformly spread over the scarified ground surface.
- D. Sod shall be moist and shall be laid in a moist earth bed. Pegs shall be used where required to hold the sod in place.

- E. Sod shall not be placed during a drought nor during the period from July 1 to August 15.
- F. Sod to be kept moist by the contractor for fourteen (14) days to insure growth.
- G. The cost of providing for and meeting the sodding requirements shall be included in the bid price or at no extra cost to the owner.

1.17 FINAL CLEANUP, GRADING, TOP SOIL AND SEEDING

- A. Upon completion of construction and before final payment is made, the contractor shall restore the working area to as clean a condition as existed before construction operations started.
- B. The Contractor shall go over the entire area and regrade and fill any areas that may have settled, including fills made from excess excavated materials and all other areas that may have been disturbed during construction operations.
- C. Where established lawn or grass areas have been disturbed by the contractor's operations, the Contractor shall provide, unless otherwise specified or called for on the drawings or in the specifications, not less than the minimum depth of approved top soil and shall grade, seed, fertilize and mulch the areas as required by the Owner and per the following Table:

<u>Location</u>	<u>Seed Mixture</u>	<u>Amount of Seed</u>	<u>Fertilizer</u>	<u>Top Soil (min.)</u>
Lawn	MDOT Class A	100 lb/Acre	400 lb/Acre	3"
Other Areas	MDOT Roadside	35 lb/Acre	200 lb/Acre	2"

- D. Fertilizing and sowing shall be done in an approved manner, and the seed shall be covered by light raking or dragging, and then rolled with a light roller. Fertilizer shall be 10-6-4 commercial type.
- E. Seeding areas are to be kept moist for fourteen (14) days to insure growth. The cost of providing for and meeting these requirements shall be incidental to the project unless otherwise provided.

1.18 EXISTING STRUCTURES AND UTILITIES

- A. Certain underground structures and utilities have been shown as an aid to the contractor, but the owner does not guarantee their location or that other underground structures or utilities may not be encountered.

1.19 PUBLIC AND PRIVATE UTILITIES

- A. Utilities
 - 1. The Contractor must provide adequate protection for water, sewer, gas, telephone, TV cable, or any other public or private utilities encountered. The Contractor will be held responsible for any damages to such utilities arising from his operation.
 - 2. When it is apparent that construction operations may endanger the foundations of any utility conduit, or the support of any structure, the contractor shall notify the utility owner of this possibility and shall take steps as may be required to provide temporary bracing or support of conduit or structures.

3. 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.
4. Where it is necessary in order to carry out the work, that a pole, electric or telephone, be moved to a new location, or moved and replaced after construction, the contractor shall arrange for the moving of such pole or poles, and the lines thereof, and shall pay any charges therefor.
5. Where it is the policy of any utility owner to make repairs to damaged conduit or other structures, the contractor shall cooperate to the fullest extent with the utility and shall see that construction operations interfere as little as possible with the utilities operations. The contractor shall pay any charges for these repairs.

B. Existing Sewer Facilities

1. Existing sewers or drains may be encountered along the line of work. In all such cases, the contractor shall perform the work in such a manner that sewer service will not be interrupted. and shall make all temporary provisions to maintain sewer service as incidental to the work as bid.
2. Unless otherwise indicated on the drawings, the contractor shall replace any disturbed sewer or drain, or relay same at a new grade and/or location to be established by the Owner such that sufficient clearance for the sewer will be provided.
3. The contractor will receive no extra compensation for replacement or relocation of sewers or drains encountered, or for relaying at a new grade where called for by the drawings unless a separate bid item has been included in the proposal.

C. Existing Water Facilities

1. Where existing water mains are encountered in the work, they shall be maintained in operation. If necessary, they shall be re-laid using ductile iron pipe of the type and with joints as specified within the current water main specifications of the governmental agency controlling said utility.
2. The contractor will receive no extra compensation for the relaying and/or lowering or raising of water mains or water service leads, except where a separate bid item has been included in the proposal.

D. Existing Gas Facilities

1. Where existing gas mains and services are encountered, the contractor shall arrange with the gas company for any necessary relaying, and shall pay for the cost of such work unless otherwise provided.

1.20 PUMPING, BAILING AND DRAINING

- A. The contractor shall provide and maintain adequate pumping and drainage facilities for removal and disposal of water from trenches or other excavations.
- B. Where the work is in ground containing an excessive amount of water, the contractor shall provide, install, maintain, and operate suitable deep wells or well points, connecting manifolds and reliable pumping equipment to operate same to insure proper construction of the work. Alternate dewatering methods may be implemented if approved by the Owner.
- C. Drainage or discharge lines shall be connected to adjacent public storm water drains or extended to nearby water courses wherever possible. In any event, all pumping and drainage

shall be done without damage to any highway or other property, public or private, and without interference with the rights of the public or private property owners and in accordance with the MDEQ and local requirements for soil erosion and sedimentation control.

- D. The contractor shall receive no extra compensation for providing, maintaining or operating any dewatering or drainage facilities.

1.21 SHEETING, SHORING AND BRACING

- A. Where necessary in order to construct the work called for by the contract, to insure the safety of the workers, or to protect other things of value, the contractor shall use and, if necessary, leave in place, such sheeting, shoring, and bracing as is needed to carry out the work or to adequately insure the stability of such work, or to insure the safety of the workers and/or to protect adjoining things of value. The contractor will receive no extra compensation for sheeting, shoring, or bracing, whether removed or left in place.

1.22 DISPOSAL OF EXCAVATED MATERIAL

- A. With the exception of an amount of excavated materials sufficient for backfilling and construction of fills, as called for on the drawings, all broken concrete, stone, and excess excavated materials shall be disposed of from the site by the contractor. The contractor will be required to obtain his own disposal ground, and will receive no extra compensation for disposing of any of the excess materials.

1.23 DISPOSAL OF WASTE MATERIALS

- A. Unless otherwise directed by the owner, all waste materials and debris resulting from the construction work shall be removed from the premises at no extra cost to the owner.
- B. The contractor shall, at all times, keep the premises free from accumulations of waste material or debris caused by his employees or work, and shall remove same when necessary or required by the owner.

1.24 TUNNELING

- A. The contractor shall construct the work in tunnel where shown on the drawings or required by permits, and at other locations may, at his option, construct the work in tunnel where it crosses existing roadways, public and private utilities, walks or other structures. Tunnel work shall be constructed in accordance with the drawings and specifications, "Road Permit" requirements, or as otherwise noted on the drawings at no extra cost to the owner.

1.25 COMPRESSED AIR

- A. The contractor shall provide compressed air as required for the work at no extra cost to the owner.

1.26 EXPLOSIVES

Explosives may be brought or used on the premises only with the written consent of the owner.

- A. If explosives are used, the contractor shall comply with all laws, rules, and regulations governing their use. The contractor shall be fully responsible for the safety of all persons and property and any approval by the owner shall not relieve the contractor of such responsibility.
- B. All fees and assessments in connection therewith shall be paid for by the contractor, the cost of which shall be included in the proposal. The contractor shall be responsible for furnishing sufficient, properly qualified safety inspectors as required by the state and local governing bodies. The cost of providing for and meeting the requirements for handling explosives shall be at no extra cost to the owner.

1.27 INSPECTION OF PREMISES

- A. The bidder shall visit the premises and thoroughly acquaint himself with the conditions to be encountered in the installation of the work shown on the drawings and described in the specifications, as no extras will be allowed to cover work which he has not included in his tender due to his failure to inspect the premises.

1.28 SCHEDULE OF OPERATIONS

- A. The contractor shall submit, for the owner's review and approval, a schedule of his proposed operations. The contractor's schedule shall be complete and shall show in detail the manner in which he proposed to complete the work under this contract.

1.29 ORDINANCES AND CODES

- A. All work shall be executed and inspected in accordance with all local and state rules and regulations and all established codes applicable thereto and shall conform in all respects to the requirements of all authorities having jurisdiction thereover.
- B. Should any change in the contract plans and/or specifications be required to comply with local regulations, the contractor shall notify the owner in accordance with Specification 00120, Instructions to Bidders. After entering into contract, the contractor will be held to complete all work necessary to meet the local requirements without extra expense to the owner.
- C. Where the work required by the drawings and specifications is above the standard required, it shall be done as shown or specified.

1.30 REQUIREMENTS PERTAINING TO WORK WITHIN RAILROAD RIGHTS-OF-WAY

- A. Where the contract drawings call for work within railroad rights-of-way or where the work crosses under railroad tracks, the contractor shall secure the approval of the railroad company of the method and schedule of operations and shall carry out the work in strict accordance therewith, all to the satisfaction of the railroad company and at no extra cost to the owner.
- B. The owner will pay the cost of all inspectors and flagmen required and furnished by the railroad company during the construction operations.
- C. The additional named insured under General Supplementary Conditions for "Owner and Contractor's Protective Public Liability and Property Damage Insurance" shall include the name of the railroad company.

1.31 TRAFFIC CONTROL

- A. During construction the contractor shall control traffic in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices issued by the Michigan Department of Transportation.

1.32 DUST CONTROL

- A. The contractor shall provide adequate measures to control dust caused by his operation. The methods employed, and frequency of application shall be as approved and directed by the Owner.

1.33 INCONVENIENCES

- A. The contractor shall at all times be aware of inconveniences caused to the abutting property owners and general public. Where undue inconveniences are not remedied by the contractor, the municipality, upon four hours notice, reserves the right to perform the necessary work and to have the owner deduct the cost thereof from the money due or to become due to the contractor.

END OF SECTION

SECTION 01005

ADMINISTRATIVE PROVISIONS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- 1.02 Related Sections
- 1.03 Summary of work.
- 1.04 Work sequence.
- 1.05 Alternatives.
- 1.06 Coordination
- 1.07 Cleanliness of the work and streets.
- 1.08 Regulatory requirements.
- 1.09 Alterations of existing water mains and services.
- 1.10 Satisfaction of Claims
- 1.11 Fire protection.
- 1.12 Chemicals.
- 1.13 Historical specimens.
- 1.14 Abbreviations.
- 1.15 References.

1.2 RELATED REQUIREMENTS

- A. Section 00120 - Instructions to Bidders.
- B. Section 00500 - Contract.
- C. Section 00700 - General Conditions.
- D. Section 00800 - General Supplementary Conditions.
- E. Section 01000 - General Specifications.
- F. Section 01310 - Progress Schedules.

G. Section 01700 - Contract Closeout.

H. Section 02030 - Sequence of Construction and Special Project Requirements.

1.3 SUMMARY OF WORK

A. The work consists of the construction below grade of a 5.5 million gallon concrete Retention Treatment Basin, 266 ft x 147 ft x 28 ft (20.5 ft S.W.D.), a concrete inlet shaft and structures, a Control Building above grade, and an access road. The work also includes 24 ft x 7 ft effluent conduit and outfall structure, dewatering and decanting pumps, disinfection and odor control systems, flushing systems, miscellaneous appurtenances and utilities connections.

1.4 WORK SEQUENCE

A. The Contractor shall arrange his work so that at no time will it cause unnecessary interruption to the operation of existing facilities. To this end, the Contractor shall prepare and submit to the Engineer for approval a complete detailed working schedule setting forth the sequencing of operations he proposes to follow.

1.5 ALTERNATIVES

A. Contract Drawings indicate the extent and general arrangement of the work. If any departures from the Contract Drawings are deemed necessary by the Contractor to accommodate the material and equipment he proposes to furnish, details of such departures and reasons thereof shall be submitted as soon as practicable to the Engineer for approval.

B. The Contractor shall refer to Section 01300, SUBMITTALS, for complete requirements regarding Alternates, Substitutions.

1.6 COORDINATION

A. Contract Documents:

1. It is not the intent nor shall it be so construed that work included in any one Section of the Specifications must be performed by a particular trade or by subcontract. The work to be performed by a particular trade is not necessarily restricted to that of any one Section.
2. Any item mentioned under any heading must be supplied even though it is not called for again under the heading for the respective work.

B. Existing Facilities:

1. All existing facilities and operations shall be uninterrupted by the Contractor's performances unless otherwise allowed in the Contract Documents.
2. All proposed interruptions or tie-ins to existing facilities or utilities or other activities affecting the operations shall be scheduled.
3. The Engineer shall approve the scheduling of all such activities.

1.7 CLEANLINESS OF THE WORK AND STREETS

A. The work itself, and all public and private property used therewith, shall be kept in a neat orderly condition at all times. Excess excavation, waste and rejected materials, rubbish, and

debris shall not be allowed to accumulate. The newly constructed work shall be cleared of all temporary construction of facilities when such are entirely free of all debris and the premises left in a condition that will not be susceptible to soil erosion and that will not create a situation problem.

- B. Trucks hauling loose materials to or from the site shall be tightly covered and their loads shall be trimmed to prevent spillage on the public streets or roads. This requirement likewise applies to suppliers making deliveries to the site. The Contractor shall promptly clean streets or roads dirtied by any cause arising from his operations or that of his Subcontractors or his suppliers. Should the Contractor fail to maintain proper street or road cleanliness, the Owner will take necessary steps to perform such cleaning and will charge the Contractor for all cost thereof.
- C. The Contractor shall control dust from his operations to meet the requirements of the jurisdictional authorities. Control measures shall include but are not limited to sprinkling, applying calcium chloride, wheel washing, street sweeping, street washing, load covering, and the like.

1.8 REGULATORY REQUIREMENTS

- A. The requirements of this Article shall be made a part of any subcontracts entered into.
- B. Refer to General Conditions, Article No. 6.
- C. The Contractor shall apply for inspection of the work to any and all local, state, public and/or private utilities or national authorities having jurisdiction and deliver to the Engineer all required certificates of approval of such authorities.
- D. All costs including fees, inspection charges, temporary improvements, and the restoration of existing improvements (e.g. sidewalks, pavements, soil erosion and sedimentation control, landscaping, etc.) to the satisfaction of the authority having jurisdiction in each case shall be included in the Contract Price.

1.9 ALTERATIONS OF EXISTING WATER MAINS OR SERVICES

- A. The cutting, reconstructing, or relocating of any existing water mains or water services connections necessitated to permit construction of the work under this Contract shall be performed by the contractor, and the cost of all work and material including inspection and permits shall be included in the Contract bid price.
- B. The Contractor shall not operate any valves or switches. All valves and switches shall be operated by the Owner's personnel only.
- C. If the Contractor finds it necessary to shut down any existing water mains in services, he shall contact the Engineer and they will then negotiate the best time for shut down mains. A minimum of three (3) days notice must be given.
- D. The Contractor shall receive no extra payment on account of the times when such shut offs and alterations have to be made or on account of delays incurred in conjunction with such alterations.

1.10 SATISFACTION OF CLAIMS

- A. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled, or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained to secure payment therewith interest.
- B. In the event that any Contractor has trespassed upon private property in the prosecution of the work of this contract, the Owner may withhold payment for the value of such work in or on the property, but in any case no less than a sum of \$500 for each property trespassed until the Contractor has secured a release from the property owner upon whose property the trespass was committed.

1.11 FIRE PROTECTION

- A. The Contractor shall take all necessary precautions to prevent fires and shall provide adequate equipment for extinguishing fires. No burning of trash or debris will be permitted.
- B. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.

1.12 CHEMICALS

- A. All chemicals used during construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, or reactant of other classification, must show approval of the EPA, USDA, or both. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable law, rules, and regulations.

1.13 HISTORICAL SPECIMENS

- A. Any and all specimens of historical or scientific value or interest encountered in the Work shall be preserved and delivered to the Engineer.

1.14 ABBREVIATIONS

- A. The following listed letters or abbreviations wherever they appear in the Contract shall mean and be interpreted as indicated below:
 - A.A.S.H.O. - American Association of State Highway Officials
 - A.C.I. - American Concrete Institute
 - A.G.M.A. - American Gear Manufacturers Association
 - A.H.D.G.A. - American Hot Dip Galvanizers Association
 - A.I.A. - American Institute of Architects
 - A.I.S.C. - American Institute of Steel Construction
 - A.I.S.I. - American Iron and Steel Institute
 - A.M.C.A. - Air Moving and Conditioning Association
 - A.N.S.I. - American National Standards Institute

A.S.C.E.	- American Society of Civil Engineers
A.S.H.R.A.E.	- American Society of Heating, Refrigeration and Air Conditioning Engineers.
A.S.M.E.	- American Society of Mechanical Engineers
A.S.T.M.	- American Society for Testing and Materials
A.W.G.	- American Wire Gauge
A.W.S.	- American Welding Society
A.W.W.A.	- American Water Works Association
D.P.W.	- Department of Public Works - City of Detroit
D.W.S.D.	- Detroit Water & Sewerage Department
Fed. Spec.	- Federal Specification, Federal (of F.S.) Supply Service, General Services Administration, U.S. Government
I.E.E.E.	- Institute of Electrical and Electronics Engineers
I.P.C.E.A.	- Insulated Power Cable Engineers Association
M.D.O.T.	- Michigan Department of Transportation (Formerly M.D.S.H. & T)
M.I.O.S.H.A.	- Michigan Occupational Safety & Health Act
N.B.S.	- National Bureau of Standards
N.C.P.I.	- National Clay Pipe Institute
N.E.C.	- National Electrical Code
N.E.M.A.	- National Electrical Manufacturers Association
N.F.P.A.	- National Fire Protection Association
O.S.H.A.	- Occupational Safety & Health Administration
S.D.I.	- Steel Deck Institute
S.J.I.	- Steel Joist Institute
S.S.P.C.	- Steel Structures Painting Council
U.L.	- Underwriters Laboratories

1.15 REFERENCES

- A. Specifications by Reference:
1. Where reference is made in the specifications to specifications or standards of any technical society, association, governmental agency, etc., it is understood and agreed that such specifications or standards are as much a part of the specifications as though fully repeated therein.
- B. Materials by Reference:
1. A material included in more than one section of the specifications will be specified in detail in only one of the Sections.
 2. In other sections, the material is specified by reference to the section containing the specifications for the same material, and such specifications shall be considered as much a part of the other sections as if they were therein repeated in full.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Related Sections
- B. Coordination.
- C. Pre-Bid Meeting.
- D. Pre-Award Meeting.
- E. Preconstruction Meeting.
- F. Progress Meetings.
- G. Preinstallation Meetings.

1.2 RELATED SECTIONS

- A. Section 00120 – Instructions for Bidders.
- B. Section 00700 - General Conditions.
- C. Section 00800 - General Supplementary Conditions.
- D. Section 01005 - Administration Provisions.
- E. Section 01300 - Submittals.
- F. Section 01310 - Progress Schedules.

1.3 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit,

as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- D. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 PRE-BID MEETING

- A. Engineer will schedule a meeting as noted in the Information for Bidders.
- B. Attendance Required: Owner, Engineer, and Bidders.
- C. Attendance Requested: Regulatory Agencies, Utility Representatives.
- D. Agenda:
 - 1. Review of Permits Required.
 - 2. Review of Special Project Requirements.
 - 3. Regulatory requirements affecting the project.
 - 4. Review of Contract Documents.
 - 5. Critical work sequencing.
 - 6. Use of premises by Owner and Contractors
 - 7. Construction facilities and controls provided by Owner.
 - 8. Temporary utilities provided by Contractor and by Owner.
 - 9. Survey and layout.
 - 10. Security and housekeeping procedures.
 - 11. Responsibility for testing.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.

1.5 PRE-AWARD MEETING

- A. Engineer will schedule a meeting prior to issuing Notice of Award.
- B. Attendance Required: Owner, Engineer, and Contractor.
- C. Agenda:
 - 1. Review of Owner-Contractor Agreement.
 - 2. Review of Submission of bonds and insurance certificates.
 - 3. Regulatory requirements affecting the project.
 - 4. Review of Federal, State and Local contract requirements.
 - 5. Review of list of Subcontractors, list of Products, and schedule of values.
 - 6. Designation of personnel representing the parties in Contract, and the Engineer.
 - 7. Critical work sequencing.
 - 8. Use of premises by Owner and Contractor
 - 9. Construction facilities and controls provided by Owner.

- 10. Mobilization
- 11. Project Coordination

- D. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.

1.6 PRECONSTRUCTION MEETING

- A. Engineer will schedule a meeting prior to issuing Notice of Award.
- B. Attendance Required: Owner, Engineer, major subcontractors and Contractor.
- C. Agenda:
 - 1. Review of Execution of Owner-Contractor Agreement.
 - 2. Review of Regulatory requirements affecting the project.
 - 3. Distribution of Control Documents.
 - 4. Submission of progress construction schedule.
 - 5. Designation of personnel representing the parties in Contract, and the Engineer.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Critical work sequencing.
 - 8. Use of premises by Owner and Contractor
 - 9. Construction facilities and controls provided by Owner.
 - 10. Mobilization
 - 11. Project Coordination
 - 12. Temporary utilities provided by Contractor and Owner.
 - 13. Survey and layout.
 - 14. Security and housekeeping procedures.
 - 15. Procedures for testing.
 - 16. Procedures for maintaining record documents.
- D. Record minutes and distribute copies within two days after meeting to participants, with one copy to all participants, and those affected by decisions made.

1.7 PROGRESS MEETINGS

- A. The Engineer will schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and Suppliers, Owner, Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.

5. Review of submittals schedule and status of submittals.
6. Review of on site and off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.

1.8 PREINSTALLATION MEETING

- A. When required in individual specification sections, convene a preinstallation meeting at work site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 1. Review conditions of installation, preparation and installation procedures.
 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with copies to Engineer, Owner, participants, and those affected by decisions made.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SCHEDULE FOR SUBMISSION

- A. Submittal procedures
- B. Submittal Review
- C. Proposed Products list
- D. Shop Drawings, Product Data, and Samples
- E. Manufacture's installation instructions
- F. Manufacture's certificates

1.2 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 01400 - Quality Control
- C. Section 01700 - Contract Closeout

1.3 SCHEDULE FOR SUBMISSION

- A. Prior to submitting any shop drawings, product data, portfolios, samples, etc. the Contractor shall prepare a summary, listing all items in the project which he will submit for review by the Engineer.
- B. The summary shall be submitted within twenty (20) calendar days after receipt of Notice to Proceed and shall be updated once per month thereafter.
- C. The summary shall include the proposed dates for submittal for each item for control purposes. The summary shall be prepared in coordination with the Project Schedule for Construction and adequate time shall be allowed therein for review and possible resubmittal.
- D. The summary and schedule for submittals shall not relieve the Contractor of his obligation to comply with specification requirements for items not listed on the schedule.
- E. Nothing herein shall be construed as allowing additional time for completion of the project in the event resubmittal is required for shop drawings or the other items to be submitted.

1.4 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer approved transmittal form.
- B. Sequentially number the transmittal form. Re-submittals shall have original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor and supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to the Engineer in a manner to allow sufficient time for review and processing by the Engineer so as to not cause delays in the Work. Coordinate submission of related items.
- F. All drawings, information and documentation shall be prepared and submitted with all words in the English language and dimensions in American units. No foreign language or metric units will be permitted.
- G. Identify variations from Contract Documents and Products and system limitations which may be detrimental to successful performance of the completed work.
- H. Provide space for Contractor and Engineer review stamps.
- I. Revise and resubmit submittals as required and identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals to all concerned and related parties. Instruct parties to promptly report any inability to comply with provisions.
- K. The Engineer reserves the right to refuse to check or review any submittal of a subcontractor or manufacturer which is not presented in compliance with the foregoing requirements.
- L. Electronic Submittals:
 - 1. All electronic submittals shall follow the procedures outlined above.
 - 2. Electronic submittal procedures are only applicable to Shop Drawings and product data submittals.
 - 3. Electronic submittals shall be made in a standard format the Engineer has agreed in advance to accept, JPEG, TIF, DGN, DXF, DWG, or PDF.
 - 4. Reviewed submittals shall be returned in JPEG, TIF, or PDF electronic format for the Contractor's printing and distribution.

1.5 SUBMITTAL REVIEW

- A. All subcontractors and manufacturers' drawings shall first be sent directly to the Contractor, who shall keep a record of the drawing numbers and the dates of receipt. The Contractor shall check thoroughly all such drawings, as regards measurements, sizes of members, materials, and all other details to assure himself that they conform to the intent of the drawings and the

specification, and shall promptly return to the subcontractors and/or manufacturers for correction such drawings as are found inaccurate or otherwise in error.

- B. The Engineer will review the Contractor's, subcontractors' and manufacturers' drawings within a reasonable time after receipt thereof and will return one copy endeavoring to indicate, by notation thereon or written instructions, any correction which may be necessary to meet the Contract requirements. The Contractor shall then review such notations and/or instructions and if he concurs therein, shall make or have made such required corrections, and shall, when so noted on the drawings or requested by the Engineer, resubmit corrected drawings to the Engineer as soon as possible, for final review. Such further review by the Engineer will be limited to the corrections only, and the Contractor, by such re-submission shall be held to have represented that such drawings contain no other alterations, additions or deletions, unless the Contractor (in writing) directs the Engineer's specific attention to same. Should the Contractor question, or dissent from, such notations and/or instructions, he shall so inform the Engineer and request further clarification before resubmitting the drawings.
- C. The review of Contractor's, subcontractors', and manufacturers' drawings by the Engineer is for coordination and assistance, and the Engineer does not thereby assume responsibility for errors or omissions. Such errors or omissions must be made good by the Contractor, irrespective of the receipt, review of the drawings by the Engineer, and even though the work is done in accordance with such drawings.

1.6 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement submit list of all major products proposed for use, including those previously called for to be submitted in the Proposal, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Substitutions: Whenever a particular brand or make or type of material, equipment, or other item is specified or is indicated on the Contract Drawings, it is for the purpose of establishing a standard of quality, design, and type desired and to supplement the detailed specifications. Any other brand or make or type which in the opinion of the Engineer is equivalent to that specified or indicated may be offered as a substitute, subject to the following provisions:
 - 1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials where feasible to enable the Engineer to determine if the proposed substitution is equal to that specified.
 - 2. Contractor shall submit certified tests where applicable by an independent laboratory, acceptable to the Owner, attesting that the proposed substitution is equal.
 - 3. A list of installations where the proposed substitution is used.
 - 4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.
 - 5. Where the review of a substitution requires revision or redesign of any part of the work, all such revision and redesign and all new drawings and details required, therefore, shall be provided by the Contractor at his own cost and expense and shall be subject to the review of the Engineer.

6. In all cases, the Engineer shall be sole judge as to whether a proposed substitution is to be incorporated into the project. The Contractor shall abide by the Engineer's decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without review of the Engineer.

1.7 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. The intent of the Contract Documents is to include in the contract price the cost of all labor and materials, water, fuel, tools, plant, equipment, light, transportation, and all other expenses as may be necessary for the proper execution and completion of the work.
- B. While the contract drawings and specifications propose to be complete in all respects as to layout, type of equipment and materials, they are not intended to serve as detailed sleeve or insert drawings, and the preparation of such drawings required or necessary for this purpose, or to set equipment accurately, shall be the responsibility of the Contractor.
- C. These Contract Documents shall be supplemented by other drawings, product data, samples and portfolios of all equipment, apparatus, materials, etc. furnished by the Contractor and reviewed by the Engineer. All such supplementary drawings or instructions are intended to be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. Therefore, no extra charge will be allowed on a claim that particular supplemental drawings or instructions differed from the Contract documents, incurring extra work, unless the Contractor has first brought the matter, in writing, to the Engineer's attention for proper adjustment before starting on the work covered by such and has received from the Engineer an order in writing to so proceed.
- D. These original and supplementary drawings constitute the drawings according to which the work is to be done. The Contractor shall keep at the site of the work, copies of all drawings and specifications and shall at all times give the Engineer or Owner access thereto.
- E. Shop Drawings are drawings, diagrams, schedules other data specifically prepared for the Work by the Contractor or a subcontractor, Subcontractor manufacturer, supplier or distributor to illustrate some portion of the Work.
- F. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of these submittals is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.
- G. Product Data are illustrations, standard schedules, performance charts, instructions, catalog cuts, brochures, diagrams, materials lists and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
- H. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- I. The Contractor shall review, approve, and submit to the Engineer, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents requested by the Engineer or Owner or otherwise necessary for the proper execution of the work, with reasonable promptness and in such sequence as to cause no delay in the Work or in the

activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

- J. The Contractor shall perform no portion of the Work requiring submittal, resubmittal, and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed by the Engineer. Such Work shall be in accordance with reviewed submittals.
- K. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or contained within such submittals with the requirements of the Work and of the Contract Documents.
- L. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer's review of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submittal and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in the Shop Drawings, Product Data, Samples or similar submittals by the Engineer's review thereof, as the Engineer's review is intended to cover compliance with the Contract Document and not to enter into every detail of the shop work.
- M. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those required by the Engineer on previous submittals.
- N. When professional certification of performance criteria of materials systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.
- O. Shop Drawings
 - 1. Submit in the form of two legible opaque copies.
 - 2. One reviewed copy will be returned to the Contractor for his duplication and distribution.
 - 3. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article herein and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.
- P. Product Data
 - 1. Submit two copies of the documents which the Engineer requires. One reviewed copy will be returned to the Contractor for his duplication and distribution.
 - 2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
 - 3. Product data shall be bound with an index sheet containing a space at least 5" x 8" for review stamps and notes.
 - 4. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

- Q. Samples
1. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 2. Submit samples of sufficient size and representative of finishes indicating textures, and patterns for Owner selection.
 3. Include identification on each sample, with full Project information.
 4. Submit the number of samples specified in individual specification sections; two of which will be retained by the Engineer.
 5. Reviewed samples which may be used in the work are indicated in individual specification sections.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, operating, maintaining and finishing to the Engineer in quantities specified for Product Data.
- B. Identify conflicts between manufacturer's instructions and contract documents.

1.9 MANUFACTURER CERTIFICATES

- A. When specified in individual sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product meets or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Engineer.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01310
PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Format.
- B. Content.
- C. Revisions to schedules.
- D. Submittals.

1.2 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 00800 - General Supplementary Conditions
- C. Section 01000 - Specifications General
- D. Section 01300 - Submittals: Shop drawings, product data, and samples

1.3 FORMAT

- A. Prepare schedules as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Multiples of 11 x 17 inches

1.4 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules to define critical portions of the entire schedule.

- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the last day of each month.
- F. Provide separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.

1.5 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect, on schedules of separate contractors.

1.6 SUBMITTALS

- A. Submit initial schedules within 30 days after date established in Notice to Proceed. After review, resubmit required revised data within ten days.
- B. Submit the number of opaque reproductions which Contractor requires, plus four copies which will be retained by Engineer or, submit one opaque reproduction and one reproducible transparency.

1.7 DISTRIBUTION

- A. Distribute copies of reviewed schedules to Project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References.
- D. Mockup.
- E. Inspecting and testing laboratory services.
- F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.
- B. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.

- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date specified in the individual specification sections, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect/Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 MOCK-UP

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups are representative of the quality required for the Work.
- D. Where mock-up has been accepted by Architect/Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.7 INSPECTING AND TESTING LABORATORY SERVICES

- A. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing, as required.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the Owner.
- C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Engineer or the Owner.
- D. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing or inspecting does not relieve Contractor of performing Work to contract requirements.
- G. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the Contract Sum.

1.8 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 30 days of observation to Engineer for information.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone and fax service, water supply, and sanitary facilities.
- B. Temporary Controls: Fire Protection, Barriers, enclosures and fencing, protection of the Work, and ground and surface water control.
- C. Construction Facilities: First Aid Facilities Access roads, parking, progress cleaning, project signage, existing utilities, structures and temporary buildings.
- D. Temporary River Crossing: Construction and removal of temporary river crossing and temporary approach roads.

1.2 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 01005 - Administrative Provisions
- C. Section 01580 - Project Signs.
- D. Section 01590 - Field Offices and Sheds.
- E. Section 01700 - Contract Closeout: Final cleaning.

1.3 TEMPORARY ELECTRICITY AND LIGHTING

- A. Cost: By Contractor; provide and pay for power service required from utility source.
- B. The Contractor shall provide all necessary materials and equipment required for temporary service. All circuits shall be insulated, weatherproof, equipped with an equipment grounding conductor. All enclosures and devices shall be weatherproof.
- C. When permanent electrical power and lighting systems are in operating condition, they may be used for temporary power and lighting for construction purposes provided that the Contractor:
 - 1. Obtains the approval of the Engineer.
 - 2. Assumes full responsibility for power and lighting system.
 - 3. Pays all costs for operation and restoration of the systems and for all electrical power consumed.
- D. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

- E. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- F. Maintain lighting and provide routine repairs.

1.4 TEMPORARY HEAT AND VENTILATION

- A. The Contractor shall provide heat and ventilation as required to maintain specified conditions for construction operations and to protect materials and finishes from damage due to temperature or humidity.
- B. The Contractor shall provide ventilation of enclosed areas to cure materials; to disperse humidity; and to prevent accumulations of dust, fumes, vapors, or gases.
- C. Permanent heating and ventilation systems may be used for temporary heating and ventilation during construction provided the Contractor:
 - 1. Obtains approval from the Engineer.
 - 2. Assumes full responsibility for the entire system.
 - 3. Pays for all costs for operation, maintenance, and restoration of the system and for energy consumed.
- D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.5 TELEPHONE AND FACSIMILE SERVICE

- A. Provide, maintain and pay for telephone service to field office and Engineer's field office at time of project mobilization, and during the entire duration of the project.
- B. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office at time of project mobilization, and for the entire duration of the project.
- C. Provide for removal of these services at the culmination of the project.

1.6 TEMPORARY WATER SERVICE

- A. Municipal water shall be made available for the Contractor's use provided such service is readily accessible. Any temporary extension of the facilities shall be installed by the Contractor and removed at the completion of his work. The construction of the temporary facilities shall meet all state and local codes and shall include a meter with totalizer. The discriminate use of the Municipal water for normal purposes of construction shall be at no cost to the Contractor. Excessive or indiscriminant use of water will be cause for the Municipality to require the Contractor to pay for the water used.
- B. If connections are made to the hydrants, the Contractor shall obtain authorization from the appropriate Fire Department. The Fire Department standard wrench shall be used for opening and closing the fire hydrants. Fire hydrants shall be pumped out and left dry after each use regardless of the season of the year.

1.7 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain adequate and required facilities and enclosures during the entire duration of the project.

1.8 TEMPORARY FIRE PROTECTION

- A. The Contractor shall follow the standards of the National Fire Protection Association during torch cutting or welding on the job site.
- B. The Contractor shall provide a suitable number of portable fire extinguishers (non-freeze type in cold weather) distributed about the job site.
- C. The Contractor shall store gasoline and other flammable liquids in U.L. listed safety containers in a location away from the building and distribute the liquids directly from the containers. Storage of flammable liquids shall not be allowed inside of any municipal or county building or structure.

1.9 BARRIERS

- A. The Contractor shall provide barricades, and adequate warning flags, signs, and lights in accordance with governing laws and ordinances to protect construction areas, existing facilities, and adjacent properties.
- B. Provide barricades and covered walkways required by governing authorities for public right-of-way and for public access to existing building.
- C. Provide protection for plant life designated to remain. Replace damaged plant life.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.10 FENCING

- A. Provide fencing around construction sites and equip as needed with vehicular and pedestrian gates with locks as shown on the Contract Drawings.

1.11 GROUND AND SURFACE WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. All water from whatever sources entering the work during any stage of construction shall be promptly removed and disposed. All pumping and drainage shall be done without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians or vehicular traffic, or the work of other contractors. Dewatering shall be done in such a manner that soil under or adjacent to existing structures shall not be disturbed, removed, or displaced.

1.12 ENCLOSURES

- A. The Contractor shall provide a construction plan layout showing the arrangement of temporary buildings, construction equipment, and storage and work areas. The plan must be approved by the Engineer prior to erection.
- B. The Contractor shall provide temporary insulated weather tight closure of all exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks. All access openings shall be approved by the Engineer.
- C. Provide temporary partitions and ceilings as indicated to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
- D. The construction of partitions shall be 2 x 4 framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.13 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.
- G. Prohibit construction traffic from utilizing permanent site access bridge.

1.14 SECURITY

- A. Provide security and facilities to protect Work, from unauthorized entry, vandalism, or theft.

1.15 FIRST AID FACILITIES

- A. A completely equipped, readily accessible first-aid kit shall be provided and maintained at the job site at all times.

- B. The telephone numbers for summoning aid from outside sources (e.g., Police, Fire, EMS, physicians) shall be conspicuously posted near each phone on the job site.

1.16 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.

1.17 PARKING

- A. Provide temporary gravel surface parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.
- C. Do not allow vehicle parking on existing pavement.
- D. Designate two parking spaces for the Owner and Engineer.

1.18 TRAFFIC REGULATION

- A. The Contractor's trucks and equipment operations shall be governed by all applicable ordinances; the rules and regulations of the Fire, Police, Transportation Departments; and the requirements of any other authority having jurisdiction. Flagman, warning lights, traffic signs, cones, and barricades shall be provided by the Contractor as necessary to direct and protect vehicular and pedestrian traffic at all locations of construction operations.
- B. The Contractor shall be responsible for obtaining approvals and securing permits from all authorities having jurisdiction over work in rights-of-way.
- C. The Contractor shall notify the Engineer, the local police and fire departments, all other interested local authorities, and the residents of all affected streets five days prior to any street closures.
- D. The Contractor shall provide and maintain all temporary facilities required. These shall include but not be limited to facilities necessary to maintain pedestrian and vehicular traffic access through the area or to adjacent properties and to provide unobstructed access to fire hydrants and water and gas valves. The Contractor shall provide all barriers, lights, warning flags and signals, and the like that the Engineer or other authorities may require to accommodate and protect the public.
- E. Should the Contractor fail to promptly provide or neglect to maintain the required temporary facilities or be dilatory in carrying out specific instruction to the Engineer, the Owner may with or without notice to the Contractor take such remedial measures deemed necessary and

charge the Contractor with any costs incurred therefor. Any such action, however, shall in no way serve to release the Contractor from his general or particular liability for the safety of the traveling public or the protection of property.

1.19 PROTECTION OF PROPERTY AND SURVEY MONUMENTS

- A. Before any monuments or stakes marking the boundaries of property along or near the work are removed or disturbed, notify the Engineer in sufficient time so that they can be properly located and reset. Contractor shall pay all costs incurred in connection therewith.
- B. All precautions shall be taken to avoid disturbance of permanent survey monuments of any city, county, state, or federal authority; and when any of these are disturbed or destroyed, the Contractor shall restore them to the satisfaction of such authority and shall pay all costs incurred by such authority in connection therewith.

1.20 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

1.21 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01580

PROJECT SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project identification sign.
- B. Project informational signs.
- C. Maintenance.
- D. Removal.

1.2 RELATED SECTIONS

- A. Section 10005 - Administrative Provisions
- B. Section 01300 - Submittals
- C. Section 01500 - Construction Facilities

1.3 QUALITY ASSURANCE

- A. Design sign and structure to withstand 80 miles/hr wind velocity.
- B. Sign Painter: Experienced as a professional sign painter for minimum three years.
- C. Finishes and Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.4 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01300.
- B. The submittal shall show content, layout, lettering, color, foundation, structure, sizes, and grades of members.

PART 2 PRODUCTS

2.1 SIGN MATERIALS

- A. Structure and Framing: New or used wood, structurally adequate and suitable for specified finish.

- B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, standard large sizes to minimize joints.
- C. Rough Hardware: Galvanized, aluminum or brass.
- D. Paint and Primers: Exterior quality, two coats; sign background of color as selected by the Owner.
- E. Lettering: Exterior quality paint, contrasting colors as selected by the Owner.

2.2 PROJECT IDENTIFICATION SIGN

- A. Two (2) Painted signs of construction, design, and content as called for in Section 00700, Sign GC-29A of these Specifications.
- B. Content:
 - 1. Project number, title, logo and name of Owner as indicated on Contract Documents.
 - 2. Names and titles of authorities.
 - 3. Names and titles of Engineer and Consultants.
 - 4. Name of Prime Contractor and major Subcontractors.
 - 5. Project Cost and Revenue Source
- C. Graphic Design, Colors, Style of Letterings shall be as designated by Engineer.

2.3 JOB CONSTRUCTION SIGNS

- A. Furnish, erect, and maintain job instruction signs such as "DANGER," "KEEP-OFF," etc., required to conduct the work safely.
- B. Provide all signing necessary to direct traffic into and within the site. All traffic signs shall conform to the manual of uniform traffic control devices and/or the standards of the authority having jurisdiction over the right-of-way.
- C. Relocate signs as work progress requires.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install project identification sign within 30 days after date fixed by Notice to Proceed. Install job construction signs as required.
- B. Erect project identification sign at engineer designated location.
- C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- D. Install sign surface plumb and level, with butt joints. Anchor securely.
- E. Paint exposed surfaces of sign, supports, and framing.

3.2 MAINTENANCE

- A. Maintain signs and supports in neat and clean condition.
- B. Repair or replace deteriorated and damaged signs.

3.3 REMOVAL

- A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General Provisions.
- B. Transportation and handling.
- C. Storage and protection.
- D. "Or Equal" Clause
- E. Product options.
- F. Substitutions.
- G. Installation of Equipment.
- H. Damage during tests and instruction period.
- I. Services of manufacturer's engineers.
- J. Equipment manufacturer certification.

1.2 RELATED SECTIONS

- A. Section 00120 - Instructions to Bidders: Product options and substitution procedures.
- B. Section 01400 - Quality Control: Product quality monitoring.

1.3 GENERAL PROVISIONS

- A. Products (including all materials, machinery, equipment, and systems) shall be carefully designed and installed to insure that all required functions are adequately performed within specified degrees of precision and that each unit shall operate with every other part, furnished or existing, to provide a complete integrated system which shall operate to the satisfaction of the Engineer. Any changes or revisions of existing work made necessary by the type and dimensions of furnished products shall be made at the expense of the Contractor, and he shall furnish detail drawings showing such changes or revisions for the approval of the Engineer.
- B. Submit to the Engineer ample proof that each and every part of the products to be furnished is of a reliable make and of a type which has been in successful operation within the continental United States. Installation of any experimental or untried type of apparatus, material, or machinery will not be allowed.

- C. Each major item of equipment shall have the manufacturer's nameplate securely affixed in a conspicuous place. The nameplate shall show the manufacturer's name, address, model number, rating, and any other pertinent data such as speed, horsepower, etc.
- D. All materials, equipment, and accessories shall be new and unused and shall be essentially the products of a manufacturer regularly engaged in the production of such material or equipment and shall essentially duplicate material or equipment that has been in satisfactory operation at least 5 years.
- E. The owner reserves the right to reject any material or equipment manufacturer who, although he meets the above requirements, does not provide satisfactory evidence indicating adequate and prompt post-installation repair and maintenance service as required to suit the operational requirements of Owner. Items of any one type of materials or equipment shall be the product of a single manufacturer.
- F. All piping and equipment furnished under this contract shall be fabricated of such materials that under normal operating conditions harmful substances are not imparted to the water supply system.
- G. Except as otherwise specified or required, equipment shall be primed and finish painted at the factory in accordance with the recommendations or the approved manufacturer. All equipment supplied under this contract shall include at least one quart of finish paint used for touch-up at the completion of construction.
- H. Necessary field painting shall be in accordance with the requirements of Section 09900 - Painting. Any damage to shop coating shall be corrected to the satisfaction of the Engineer.
- I. Certification shall be provided that all materials which may come into contact with potable water meets the National Sanitation Foundation Standard 61 and all MDPH regulations in force at the time of submittals.

1.4 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Transport and handle all materials in such a manner to avoid breakage, inclusion of foreign materials, and/or damage by water or other causes.
- C. Deliver packaged materials in original unopened containers. Packages or materials showing evidence of damage or contamination regardless of cause will be rejected.
- D. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- E. Repair or replace all items damaged or broken as a result of the Contractor's operation at no cost to the Owner.
- F. When specified in the individual Section, equipment shall be made available for conditional acceptance by the Engineer at the factory prior to shipment.

- G. Equipment shall not be delivered unless it can be immediately incorporated into the work or proper storage facilities are available.
- H. Crate all parts of equipment carefully to facilitate shipping and handling. Crates shall completely protect the equipment and be sufficiently strong to permit lifting and skidding without additional bracing or reinforcement.
- I. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.
- J. Notify the Engineer at least two days in advance of the delivery of equipment.

1.5 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.
- B. Store sensitive Products in weather tight, climate controlled enclosures.
- C. For exterior storage of fabricated Products, place on sloped supports, above ground.
- D. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with the provision "No Substitutions": Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for "or Equal" or Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article and Section 01300.

1.7 “OR EQUAL” CLAUSE

- A. Specifying an article, material, or piece of equipment by reference to a proprietary product or by using the name of a manufacturer or vendor followed by the clause "or equal" shall be understood to indicate the type, function, minimum standard of design, efficiency, and quality desired and shall not be construed in such a manner as to exclude products of comparable quality, design, and efficiency.
- B. Comparable products shall be capable of performing equal function and shall be compatible with other equipment, materials, or systems to which they connect or will become an integral part of.
- C. The clause "or approved equal" which may appear elsewhere in the documents shall mean the same as "or equal".
- D. Wherever in the documents an article, material, or piece of equipment is defined by specifying a proprietary product or using the name of a manufacturer or vendor the term "or equal" if not included shall be implied.
- E. Substitutions of "or equal" products are subject to approval of the Engineer.

1.8 SUBSTITUTIONS

- A. Refer also to Section 01300.
- B. Engineer will consider requests for Substitutions after the date established in Notice to Proceed.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that the Contractor:
 - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - 2. Will provide the same warranty for the Substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Also provide information required by Section 01300 for substitutions. Burden of proof is on proposer.

3. The Engineer will notify Contractor in writing of decision to accept or reject request.

1.9 INSTALLATION OF EQUIPMENT

A. General

1. Contractor shall have on hand sufficient personnel, proper equipment, and machinery of ample capacity to facilitate the work.
2. Contractor shall be responsible for locating, aligning, and leveling all equipment.
3. Complete manufacturer's installation instructions including permissible tolerances shall be furnished with each unit of equipment.
4. All equipment shall be installed in accordance with the approved manufacturer's specifications, drawings, and tolerances under the direct supervision of the required manufacturer's engineer.
5. Equipment shall be erected in a neat and workman-like manner on the foundations at the locations and elevations shown on the drawings unless directed otherwise by the Engineer during installation.

B. Installation

1. Special care shall be used in locating, aligning and, leveling all equipment and parts thereof to insure that each item is in the proper position relative to other equipment and that all parts are aligned within allowable tolerances. The Contractor shall be responsible for this accuracy and shall notify the Engineer of any conditions in prior work which would prevent this alignment before proceeding with the work. The Contractor shall employ a competent surveyor to set all lines and levels of equipment to the accuracy required.
2. All blocking and wedging required for the proper support and leveling of equipment during installation shall be furnished by the Contractor. All temporary supports shall be removed except steel wedges and bronze shims which may be left in place with the approval of the Engineer.
3. Each piece of equipment or supporting base bearing on concrete foundations shall be bedded in grout. The Contractor shall provide a minimum of 1-1/2" thick grouting or as indicated on Contract Drawings.

1.10 DAMAGE DURING TESTS AND INSTRUCTION PERIODS

- A. Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and he shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

1.11 SERVICES OF MANUFACTURER'S ENGINEERS

- A. The contract price shall include the cost of furnishing competent engineers or superintendents from each company manufacturing equipment for the Project to:
 1. Assist the Contractor to install, adjust, and test the equipment in conformity with the Contract Documents.
 2. Supervise start-up operations and adequately instruct designated employees of the Owner in the proper operation and maintenance procedures when requested by the Owner throughout the guarantee period of the equipment. A report on each visit shall be filed by the manufacturer's representative with the Engineer.

1.12 EQUIPMENT MANUFACTURER CERTIFICATION

- A. The Contractor will provide Engineer with written certification obtained from each company manufacturing equipment for the Project that the equipment is installed and does operate in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Lubrication survey.
- F. Spare parts and special tools.
- G. Equipment startup services.
- H. Substantial completion.
- I. Warranties.

1.2 RELATED SECTIONS

- A. Section 01300 - Submittals.
- B. Section 01500 - Construction Facilities.
- C. Section 01730 - Operation and Maintenance Data.

1.3 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

- A. Complete final cleaning and restoration prior to final project inspection.

- B. Remove all temporary labels, stains and foreign substances. Wash or clean by approved methods all surfaces on which dust and dirt has collected.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Clean debris from drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- G. Restore disturbed area. Lawn area may be seeded unless otherwise noted. Paved area shall be restored to their original condition, compatible with the surrounding area, using like materials and workmanship.
- H. Touchup painted surface. Clean and repaint with matching color all scratched, marred or otherwise damaged painted surfaces of all equipment and enclosures.

1.5 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. As the work progresses, keep a complete and accurate record of all changes in the Contract Documents (including Drawings, Shop Drawings, Product Data, and Specifications) indicating the work as actually installed. All changes shall be neatly shown on blue-line prints of the drawings effected or in the specifications which shall be kept at the job site for inspection by the Owner and the Engineer.
- C. Ensure entries are complete and accurate, enabling future reference by Owner.
- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda, Field Modifications and Change Orders.

- G. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish main floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.
- H. On completion of the work, prior to the Contractor's application for final payment and as a condition to its approval by the Engineer and Owner, the Contractor shall arrange such site records in order in accordance with the various sections of the specifications bind them together and index them and deliver them to the Engineer. In addition the Contractor shall request a complete set of reproducible contract Drawings, and transfer all as-built revisions and changes to them and deliver them to the Engineer. These drawings shall be dated and marked "As-Built".
- I. All reproducible tracings made by the Contractor, equipment manufacturers, and/or material suppliers shall be corrected to show the work as actually completed or installed and a reproducible copy of these drawings shall then be turned over to the Engineer.
- J. Prints in triplicate of all corrected opaque drawings shall be furnished to the Engineer prior to the issuance of the final estimate.
- K. Written approval or other evidence satisfactory to the Engineer of the final conditions of the work shall be obtained from:
 - 1. Macomb County
 - 2. Detroit Edison Company
 - 3. All public authorities or agencies having jurisdiction over any portion of the work
 - 4. Others as requested by the Engineer in writing.
- L. All public authorities or agencies having jurisdiction over any part of the work shall be determined, and all the requirements of these authorities or agencies with respect to but not limited to inspection, permits, fees, approval, and the like regardless of whether they are listed above or not shall be met.
- M. Submit all documents to Engineer for approval prior to submittal of final Application for Payment.

1.7 LUBRICATION SURVEY

- A. A lubrication survey, made by a lubricant supply firm, shall be provided and paid for by the General Contractor, subject to the approval of the Engineer.
- B. The lubrication survey shall list all equipment, the equipment manufacturer's lubrication recommendations, and an interchangeable lubricants tabulation standardizing and consolidating lubricants whenever possible.

- C. The General Contractor shall supply all lubricants, applicators and labor for lubricating the equipment in accordance with manufacturers' recommendations, for field testing and prior to final acceptance. A supply of required lubricants sufficient for start-up and initial operation shall also be supplied by the General Contractor.
- D. Five copies of the approved lubrication survey shall be furnished prior to final acceptance and shall be included within O & M Manuals furnished under Section 01730.

1.8 SPARE PARTS AND SPECIAL TOOLS

- A. Spare Parts
 - 1. As soon as practicable after approval of the list of equipment, the Contractor shall furnish spare parts data for each different item of equipment listed. The data shall include a complete list of parts and supplies with current unit prices and source of supply.
 - 2. Contractor shall also furnish a list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment or specified to be furnished a part of the Contract and a list of additional items recommended by the manufacturer to assure efficient operation for a period of 1 year at the particular installation.
 - 3. The foregoing shall not relieve the Contractor of any responsibilities under the guarantee provisions of these Specifications.
 - 4. The Contractor shall deliver all spare parts required by this contract to the Engineer or as directed by the Engineer.
- B. Special Tools
 - 1. Contractor shall furnish at no additional cost to the Owner with each piece of equipment, one complete set of suitably marked special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.
 - 2. Contractor shall submit for approval by the Engineer a complete list of the special tools and appliances to be furnished. Such tools and appliances shall be furnished in approved painted steel cases properly labeled and equipped with good grade cylinder locks and duplicate keys.
 - 3. The Contractor shall deliver all special tools required by this contract to the Engineer or as directed by the Engineer.
- C. Keys
 - 1. The Contractor shall deliver four keys for each lockset and padlocks installed under this Contract.
 - 2. The keys shall be tagged with locations, room numbers, and key numbers.
 - 3. The Contractor shall deliver all keys required by this contract to the Engineer or as directed by the Engineer.

1.9 EQUIPMENT START-UP SERVICES

- A. Equipment start-up period for the training of plant personnel shall begin after satisfactory completion and acceptance of the field tests and coincidentally with the certified date of substantial completion for that part of the work for which the equipment is included. If the equipment is not covered by a certificate of substantial completion for a part of the work, the period shall begin upon substantial completion of the project.

- B. During the equipment start-up period, the Contractor shall furnish at no additional cost to the Owner the services of factory trained representatives of the equipment manufacturers for the equipment designated in the Specifications to:
 - 1. Assist in the start-up and operations of the equipment.
 - 2. Assist in the training of facility personnel, designated by the Owner, in the proper operation and maintenance of the equipment.
- C. The Owner shall:
 - 1. Provide the necessary personnel to be instructed in the operation and maintenance of the equipment. The Owner's personnel shall operate all equipment.
 - 2. Pay for all fuel, power and chemicals consumed beyond quantities specified or in the Contract Documents or required due to Contractor's fault. The Contractor shall pay for fuel, power, and chemicals consumed up to the date of "certified substantial completion" except as otherwise specified herein.
- D. Contractor shall be available to promptly repair all work during the start-up period so as to cause minimum disruption to the total facility operation.
- E. In the event a system, equipment, or component proves defective or is unable to meet specified performance criteria, the Contractor shall replace the defective item and the one year guarantee period for the item shall start after satisfactory replacement and testing of the item.

1.10 SUBSTANTIAL COMPLETION

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy and utilize the facilities for its intended use.
- B. When the Contractor considers that the Work, or portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Engineer a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Engineer will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineer's inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall complete or correct such item upon notification by the Engineer. The Contractor shall then submit a request for another inspection by the Engineer to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer will prepare a Certificate of Substantial Completion which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

1.11 WARRANTIES

- A. Provide duplicate copies of all warranties.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers with a Table of Contents in three D side ring binder with durable plastic cover.
- C. Submit warranty documents prior to final Application for Payment.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.
- E. All parts of the work or equipment which is in the opinion of the Engineer prove defective in material, workmanship, or operation within the warranty period shall be removed and replaced or repaired in a manner satisfactory to the Engineer and at no cost to the Owner.
- F. Any service material or equipment required because of the defect shall be supplied without charge.
- G. All work specified to be designed by the Contractor shall be guaranteed to perform as specified.
- H. The Warranty period shall be one year from the date of Substantial Completion unless:
 - 1. A greater period is specified elsewhere.
 - 2. Owner chooses to take over and use a portion of the Work as provided for in the Specifications; in which case the warranty shall be one year from said takeover and use.
- I. Equipment or work replaced and/or repaired during the warranty period shall be guaranteed for one year from the date of acceptance of the repair or replacement or until expiration of the original warranty period whichever comes later.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01900

SOIL CONDITIONS AND BORING LOGS

PART 1 GENERAL

1.1 SOIL CONDITIONS

- A. The Contractor is specifically referred to in the following items in the Contract Documents regarding soils information:
1. Section 00120 – Instructions to Bidders
Article 3 - Inspection of Site
Article 4 - Sub-Soil Conditions
 2. Section 00121 - Supplemental Information for Bidders
 3. Section 00300 - Proposal Form
 4. Section 00700 - General Conditions
 5. Section 00800 - General Supplementary Conditions
 6. Section 02030 - Sequence of Construction and Special Project Requirements
 7. The location of the soil borings are indicated on the drawings. The Geotechnical Investigation Report is included in this Section.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION



SUMMARY LETTER OF THE
GEOTECHNICAL INVESTIGATION FOR
INDUSTRIAL PARK ROADWAY EXPANSION

MUSKEGON
MUSKEGON COUNTY
MICHIGAN

MAY 28, 2021

*Hubbell, Roth & Clark
1925 Brenton Road, Suite 100
Grand Rapids, Michigan 49506*

Project No. 2021.0911



May 28, 2021

Hubbell, Roth & Clark
1925 Brenton Road, Suite 100
Grand Rapids, Michigan 49506

Attention: Mr. Randy Wilcox

Regarding: Industrial Park Roadway Expansion
Muskegon, Muskegon County, Michigan
Project No. 2021.0911

Dear Mr. Wilcox:

Soils & Structures is pleased to present this letter regarding the geotechnical investigation performed for the Industrial Park Roadway Expansion project located on the south side of Olthoff Drive between S Sheridan Drive and D Baker Street in Muskegon, Muskegon County, Michigan. The site consists of a grassy field with an existing gravel road running south from Olthoff Drive.

Investigation and Testing

The investigation included two (2) test borings that extended to depths of 20.0 feet. The test borings are designated at Test Boring One and Test Boring Two. The locations were determined by Soils & Structures. An automatic hammer was used to obtain the soil samples. The test borings were conducted in accordance with ASTM D 1586 procedures. The ASTM D 1586 standard describes the procedure for sampling and testing soil using the Standard Penetration Test.

Soil samples were classified according to the Unified Soil Classification System. This method is a standardized system for classifying soil according to its engineering properties. Please refer to the appendix of this report for the Unified Classification System Chart. The classification is shown in the "Material Description" column of the test boring logs.



The soil strength may be evaluated using the “N” value. The “N” value is the number of blows required to drive a soil sampler one foot with a standard 140-pound drop hammer. The sampler is driven a distance of 18.0 inches. The number of blows for each 6.0-inch increment is recorded. The sum of the second and third intervals is the “N” value. The number of blows for each 6.0-inch interval is shown on the test boring logs under the column labeled “Blow Counts”. The “N” value for each sample is shown in the adjacent column.

Description of Soil and Groundwater Conditions

The soil profile consists of a layer of sand extending to a depth of at least 20.0 feet. The soil profile is a deposit of lacustrine sand and gravel. Lacustrine deposits are soil deposits near lakes formed by glacial activity. These deposits are typically uniform in gradation and other properties.

Topsoil is present at the surface of the site. The topsoil thickness ranges from 8.0 to 11.0 inches.

The upper portion of the sand layer consists of light brown to brown, fine to medium sand. The upper portion of the sand extends to a depth of 9.0 to 14.0 feet. The “N” values of the upper portion of the sand layer range from 6 to 14, indicating that the sand is in a slightly compact to compact state. The “N” values correspond to an internal friction angle between 28 and 32 degrees.

The lower portion of the sand layer consists of brown, fine to medium sand with a trace of gravel. The lower portion of the sand layer extends to a depth of at least 20.0 feet. The “N” values of the lower portion of the sand layer range from 9 to 57, indicating that the sand is in a compact to extremely compact state. The “N” values correspond to an internal friction angle between 30 and 36 degrees.

Groundwater is present in the area of Test Boring One at a depth of 19.0 feet. This depth corresponds to an elevation of 617.2 feet.

General Conditions & Reliance

This letter was prepared in accordance with generally accepted practices of the geotechnical engineering profession. The scope of work did not include an environmental study or wetland determination.



The test borings represent point information and may not have encountered all of the soil types and materials present on this site. This letter does not constitute a guarantee of the soil or groundwater conditions or that the test borings are an exact representation of the soil or groundwater conditions at all points on this site.

The test borings should not be used independently of the letter. If soil conditions are encountered which are significantly different from the test borings, Soils & Structures should be consulted for additional recommendations.

This letter and test borings may be relied upon by Hubbell, Roth & Clark for the design, construction, permitting and financing associated with the construction of the Industrial Park Roadway Expansion project in Muskegon, Muskegon County, Michigan. The use of this letter and test borings by third parties not associated with this project or for other sites has not been agreed upon by Soils & Structures. Soils & Structures does not recommend or consent to third party use or reliance of the letter or test borings unless allowed to review the proposed use of these materials. Unless obtained in writing, consent to third party use should not be assumed. Third parties using the letter or test boring logs do so at their own risk and are offered no guarantee or promise of indemnity.

We appreciate the opportunity to provide engineering services to Hubbell, Roth and Clark. If you have any questions regarding this letter or if we can be of further assistance, please contact our office.

Sincerely,
Soils & Structures, Inc.

Malea G. Tanner
MGT/mt

Reviewed by:

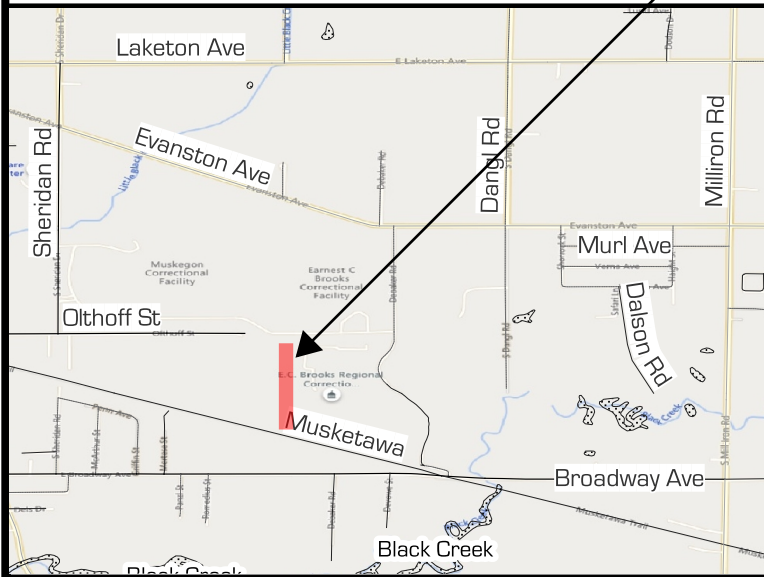
Michael J. Partenio, P.E.



Appendix
Test Boring Location Plan
Test Boring Logs
General Soil Information



VICINITY MAP (NTS)



SITE

TEST BORING LOCATION PLAN

NTS



Note: The background of the test boring plan is a portion of an aerial photograph from Google Earth.

Industrial Park Roadway Expansion

Muskegon, Muskegon County, Michigan

Soils & Structures, Inc.
6480 Grand Haven Road
Muskegon, Michigan 49441

JOB NO.: 2021.0911

DATE: 05-28-2021



Project Name:	Industrial Park Roadway Expansion		Project Number:	2021.0911	
Project Location:	Muskegon, Michigan		Logged By:	C Prell	Reviewed By: M. Tanner
Client:	Hubbell, Roth & Clark		Survey Datum:	NAD 1983 StatePlane Michigan South	
Date Started:	May 24 2021	Completed:	May 24 2021	Northing:	627231.4
Drilling Method:	3-1/4" Hollow Stem Auger		Eastng:	12641383.9	Elevation: 636.21
Equipment:	Diedrich D-50		Ground Water Levels		
Hammer Type:	Automatic Hammer		At Time of Drilling 19.00 on May 24 2021		
Notes:			End of Drilling 19.00 on May 24 2021		

Depth	Graphic	Material Description	Sample Type	Number	Recovery % RQD	Blow Counts	N-Value	Pocket Pen (tsf)	Shear Strength (tsf)	Moisture Content (%)	Atterberg Limits			USCS
											Liquid Limit	Plastic Limit	Plasticity Index	
1		TOPSOIL - dark brown fine to medium sandy with a trace of gravel (8.0")												
2		SAND - compact brown fine to coarse with a trace of gravel												
3			▲	SPT-A	100	5-6-8	14							SP
4			▲											
5			▲	SPT-B	87	2-4-5	9							SP
6			▲											
7		SAND - compact light brown fine to medium	▲	SPT-C	100	3-5-6	11							SP
8			▲											
9			▲	SPT-D	100	5-5-7	12							SP
10			▲											
11			▲											
12			▲											
13			▲											
14			▲											
15		SAND - extremely compact light brown fine	▲	SPT-E	100	14-22-35	57							SP
16			▲											
17			▲											
18			▲											
19		▼ SAND - very compact brown fine to medium	▲	SPT-F	100	9-11-14	25							SP
20			▲											
21			▲											
22			▲											
23														
24														
25														
26														
27														
28														
29														
30														



Project Name:	Industrial Park Roadway Expansion	Project Number:	2021.0911
Project Location:	Muskegon, Michigan	Logged By:	C Prell
Client:	Hubbell, Roth & Clark	Reviewed By:	M. Tanner
Date Started:	May 24 2021	Survey Datum:	NAD 1983 StatePlane Michigan South
Completed:	May 24 2021	Hole Depth:	20.00
Drilling Method:	3-1/4" Hollow Stem Auger	Northing:	626744.2
Equipment:	Diedrich D-50	Easting:	12641407.5
Hammer Type:	Automatic Hammer	Elevation:	636.27
Notes:	Ground Water Levels		
		End of Drilling	May 24 2021 - Water Not Encountered

Depth	Graphic	Material Description	Sample Type	Number	Recovery % RQD	Blow Counts	N-Value	Pocket Pen (tsf)	Shear Strength (tsf)	Moisture Content (%)	Atterberg Limits			USCS
											Liquid Limit	Plastic Limit	Plasticity Index	
1		TOPSOIL - dark brown fine sandy (11.0")												
2		SAND - slightly compact light brown fine to medium												
3			▲	SPT-A	100	2-3-4	7							SP
4			▲											
5		SAND - compact brown fine to medium with a trace of gravel	▲	SPT-B	100	4-4-5	9							SP
6			▲											
7		SAND - slightly compact brown fine to medium	▲	SPT-C	100	3-3-3	6							SP
8			▲											
9		SAND - compact brown fine to medium with a trace of gravel	▲	SPT-D	100	3-4-5	9							SP
10			▲											
11														
12														
13														
14														
15		SAND - very compact light brown fine to medium	▲	SPT-E	100	6-11-18	29							SP
16			▲											
17														
18														
19			▲	SPT-F	100	9-11-32	43							SP
20			▲											
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

General Information for Method of Field Investigation

The soil investigation was performed in accordance with the American Society of Testing and Materials method ASTM D 1586, which is the "Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils". Samples of compressible clays or organic soils are obtained in accordance with ASTM D 1587, which is the "Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes." Rock may be cored in conjunction with the above methods as specified in ASTM D 2113 which is the "Standard Practice for Rock Core Drilling and Sampling of Rock for Site Investigation."

Field Testing

Standard Penetration Tests (SPT) in accordance with ASTM D 1586 were generally performed at depths of 2.0', 4.5', 7.0', 9.5' and 5.0' intervals thereafter.

Laboratory Testing

Samples obtained from the Standard Penetration Test, ASTM D 1586 or thin walled tube method, ASTM D 1587, were tested in the laboratory for the moisture content and density and/or particle size, where applicable. When soils sampled possessed sufficient cohesive properties, it was tested for its compressive strength in the unconfined state.

Natural Percent Moisture content (N.P.M.) of the soil is the percentage by weight of water contained in the soil sample compared to the dry weight of the solids of which the soil is composed. The NPM of select samples is determined in accordance with ASTM D 2216.

Natural Density (N.D.) of soil as reported on the appended boring logs is the natural wet density of the soils expressed in pounds per cubic foot.

The unconfined compressive strength of cohesive soils is determined in the laboratory on "undisturbed" select samples in accordance with ASTM D 2166. This test determines the maximum load required at a specified rate to deform the cohesive soil specimen length twenty (20%) percent. The primary purpose of the unconfined compression test is to obtain approximate quantitative values of the compressive strength of soils possessing sufficient coherence to permit testing in the unconfined state. The shear strength of the cohesive soil can be calculated from the results of the unconfined compressive strength test.

Color

When the color of the soils is uniform throughout, the color recorded will be such as brown, gray, and black and may be modified by adjectives such as light and dark. If the soils predominant color is shaded by secondary color, the secondary color precedes the primary color, such as gray-brown, or yellow-brown. If two major and distinct colors are swirled throughout the soil, the colors will be modified by the term mottled; such as mottled brown and gray.

Water Observations

Depth of water recorded in the test boring is measured from the ground surface to the water surface. Initial depth indicates water level during boring, completing depth indicates water level immediately after boring, and depth after "X" number of hours indicates water level after allowing the groundwater rise or fall over a period of time. Water observations in pervious soils are considered reliable groundwater levels for accurate groundwater measurements at the time the test borings were performed unless records are made over several days' time. Factors such as weather, soils porosity, etc., will cause the groundwater level to fluctuate for both pervious and impervious soils.

Sample Type

If not otherwise indicated, the sample is a split-barrel liner sample ASTM D 1586.

"S.T." – Shelby tube sample, ASTM D 1587
"A" – disturbed augered sample
"C" – rock core sampled ASTM D 2113
N.P.M. – Natural Percent Moisture of in-situ soils sample
N.D. – Natural Density of in-situ soils sample in pcf.
S.S. – Shear Strength of cohesive soils samples as determined by the Unconfined Compression tests in ksf.

Classification Data – Laboratory data to assist in classification of soils and classification of soils characteristics; i.e., plastic limit or liquid limit

Test Boring Logs

Particle Size	Visual
Boulders	Larger than 12" (300 mm)
Cobbles	12" to 3" (300 to 75 mm)
Gravel - Coarse	3" to ¾" (75 to 19 mm)
Gravel - Fine	19.0 to 4.75 mm
Sand- Coarse	4.75 to 2.0 mm
Sand - Medium	2.0 to 0.425 mm
Sand - Fine	0.425 to 0.075 mm
Silt	0.075 to 0.002 mm
Clay	0.002 mm and smaller

Soils Components

Major Component	Minor Component
Gravel	Trace [1 - 10%]
Sand	Some [11 - 35%]
Silt/Clay	And [36 - 50%]

Condition of Soil Relative to Compactness

Granular Material	"N" Value
Loose	0 - 4
Slightly Compact	5 - 7
Compact	8 - 20
Very Compact	21 - 50
Extremely Compact	51 and above

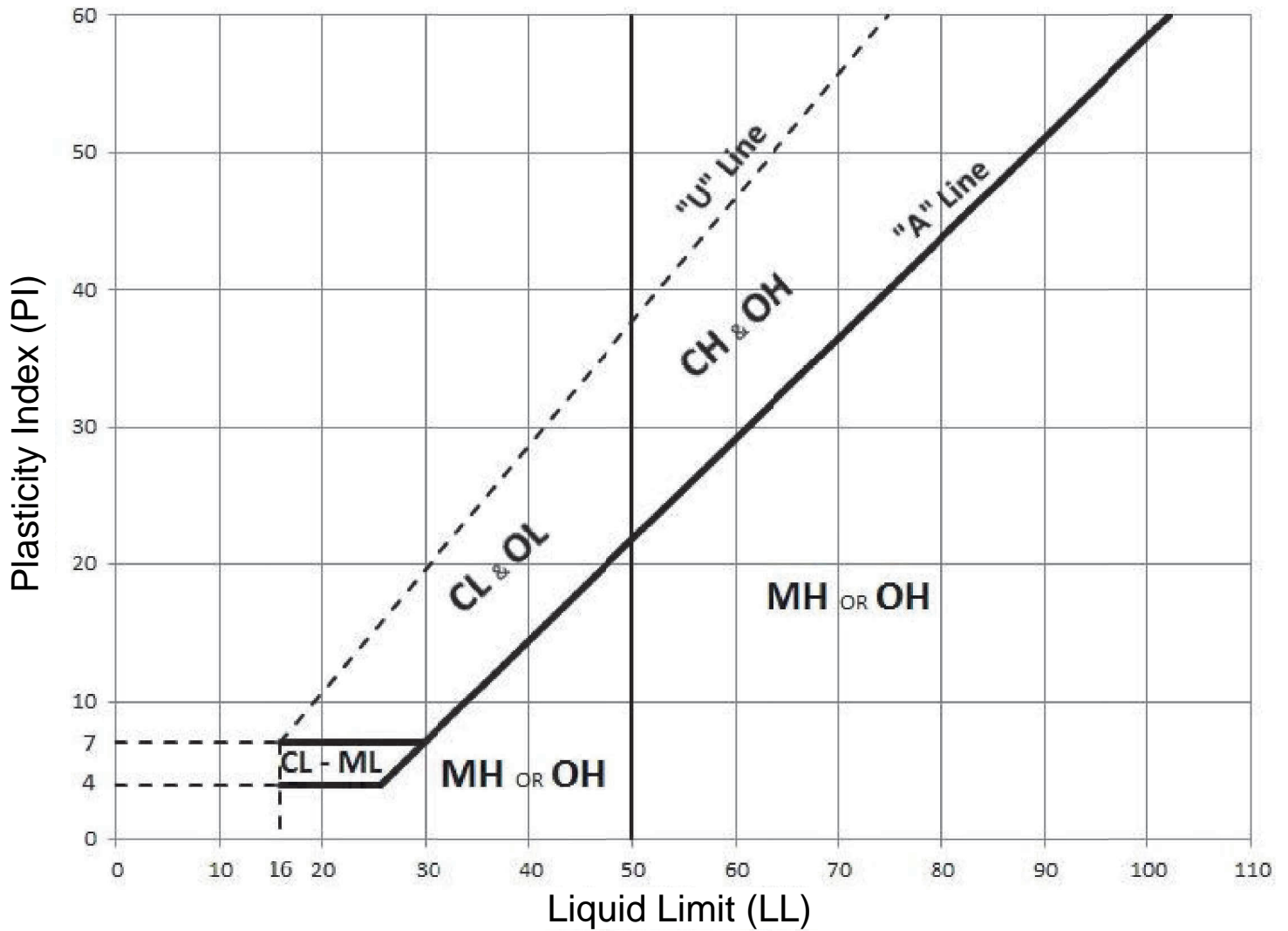
Cohesive Material	"N" Value
Soft	0 - 4
Firm	5 - 7
Stiff	8 - 20
Very Stiff	21 - 50
Extremely Stiff	51 and above

"N" values in clay soils are not to be used as a measure of shear strength. However, they may be used as a general indication of strength.

Unified Soil Classification System Chart

Major Divisions			Letter Symbol	Typical Descriptions
Coarse Grained Soils More than 50% of material is larger than No. 200 sieve size	Gravel – Gravelly Soils more than 50% of coarse fraction retained on No. 4 sieve	Clean gravels (little or no fines)	GW	Well-Graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly-Graded gravels, gravel-sand mixtures, little or no fines
		Gravel with Fines (appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils More than 50% of coarse fraction passing No. 4 sieve	Clean Sand (little or no fines)	SW	Well-Graded sands, gravelly sands, little or no fines
			SP	Poorly-Graded sands, gravelly sands, little or no fines
		Sand with Fines (appreciable amount of fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine Grained Soils More than 50% of material is smaller than No. 200 sieve size	Silts and Clays Liquid limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays or low plasticity
	Silts and Clays Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays or medium to high plasticity, organic silts
	Highly organic soils	PT	Peat, humus, swamp soils with high organic contents	

For Laboratory Classification of Fine Grained Soil Plasticity Chart



SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General
- B. Site Preparation
- C. Excavations
- D. Unauthorized Excavation
- E. Subgrade
- F. Slopes, Sheeting and Bracing
- G. Backfill
- H. Flowable Fill
- I. Finish Grading

1.2 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 01400 - Quality Control
- C. Section 01500 - Construction Facilities
- D. Section 01900 - Soil Conditions and Boring Logs
- E. Section 02110 - Site Clearing
- F. Section 02220 - Soil Erosion Control

1.3 GENERAL

- A. All excavation and backfilling shall be performed that is necessary to complete the work under this Contract. Excavation shall include the loosening, loading, removing, transporting, stockpiling, and disposing of all materials of every sort, necessary to be removed for purposes of construction; the furnishing, placing, and maintaining of all sheeting, bracing, and timbering; the care of existing roads, existing structures, utilities; and all incidental and collateral work necessary to complete the entire work as specified and as shown on the Drawings.

- B. Backfilling shall include the filling of the excavated and void spaces around and over the outside of completed structures and pipes. It is also the intention of these specifications to provide that backfill shall be so compacted that no appreciable subsequent settlement will occur, and so that sidewalks, driveways, roads and berms may be placed or replaced shortly after completion of backfilling.
- C. The Contractor will be held to have compared the conditions of the site where work is to be performed with the drawings and specifications and to have satisfied himself as to the conditions of the site, existing conditions, and any other conditions affecting the carrying out of the work, before delivery of his proposal. It is expressly understood that he will obtain first hand information concerning the available facilities for receiving, transporting, handling and storing construction equipment and materials and concerning other local conditions that may affect his work.
- D. The Contractor shall draw his own conclusions as to soil and/or rock conditions to be encountered, and he shall complete the work under any job or field condition which was present and/or ascertainable prior to bidding.
- E. He shall also complete the work under whatever conditions he may create by his own sequence of construction, construction methods, or other condition he may create at no additional cost to the Owner.
- F. The Contractor shall be responsible for evaluating the compatibility of his construction methods with the Plans, Specifications and Soil Information provided by the Owner for bidding purposes.
- G. No allowance or extra consideration on behalf of the Contractor will subsequently be allowed by reason of error or oversight on the part of the Contractor.
- H. This contractor shall grade all areas within his work area and provide slopes, shoulders, berms, and level surfaces defined according to existing and established grades.
- I. Care shall be taken to retain, at all times, normal flow of drainage water on the property and all present above ground and underground utilities.
- J. All work shall be done in a thorough and workmanlike manner and in conformance with accepted good practices and all requirements of local, state, and federal authorities having jurisdiction.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable state and local codes for disposal of excavated materials judged not suitable for backfill.
- B. Obtain disposal permit from Local Enforcing Agency.

1.5 QUALITY ASSURANCE

- A. Comply with all code, laws, ordinances, and regulations of governmental authorities having jurisdiction over this part of the work.

- B. Backfill materials shall be compacted to not less than specified percentage of optimum dry density as determined by ASTM D 698.
- C. Testing of backfill material will be done in accordance with ASTM D 2922, ASTM D 1556, and ASTM D 3017.
- D. Unsuitably compacted backfill materials shall be removed and recompacted.

1.6 SITE CONDITIONS

- A. Provide and maintain barricades, warning lights, warning signs, and other protection required by applicable laws for safety of persons and property.
- B. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent earth movement.
- C. Notify Owner of unexpected subsurface conditions and discontinue affected work area until notified to resume work.

1.7 HAZARDOUS/CONTAMINATED MATERIAL

- A. The following indicators shall be used by Owner onsite observers during excavation to identify materials suspected of being hazardous or contaminated and requiring disposal in a Type I or Type II landfill.
 - 1. Materials other than general construction debris of a color not consistent with the natural soils observed in the area;
 - 2. Materials other than general construction debris of a consistency that is not consistent with the natural soils observed in the area;
 - 3. Man-made containers, vessels, tanks, or barrels;
 - 4. Electric devices;
 - 5. Insulation or fibrous material that may contain asbestos;
 - 6. Material that emits a chemical or petroleum odor.

Based on these observations, materials in question shall be stockpiled separately, inspected, and representative samples should be collected and screened in the field. Materials should be stored on plastic sheeting at the predesignated, secure location on the parcel or an adjacent parcel and covered with plastic sheeting until disposal is determined.

- B. Potentially hazardous materials should be screened in the field by qualified personnel for the presence of volatile organic compounds (VOC) using a photoionization (PI) meter. It is assumed that the presence of VOCs should provide a general indicator of the presence of other potentially hazardous chemicals.

Materials to be subjected to further laboratory analysis should be selected based on the results of the field screening and observations made by the person monitoring the excavation.

- C. Based on the field screening and laboratory analysis, the Contractor will be advised by the Owner as to the required method of disposal.
- D. The Owner will be responsible for testing of hazardous/contaminated material.

- E. Refer to Section 00700 - General Conditions, Section No. 50 for additional requirements.

PART 2 PRODUCTS

2.1 BACKFILL

- A. All material necessary to complete the backfill as shown on the drawings or to replace excavated unsuitable material shall be furnished by the Contractor. Backfill at the structures, unless otherwise indicated on the Drawings, backfill replacing unsuitable material, backfill under gravel or stone and paved roads, shall all be granular material conforming to Michigan Department of Transportation (MDOT) Granular Materials Class II. If suitable material for backfilling is not available on site then suitable material shall be brought in from an off-site borrow pit by the Contractor at no additional cost to the Owner.
- B. The Owner shall have the right to reject any backfill material which when used in the work, does not accomplish the required compaction.
- C. All backfill material shall be free from large or frozen lumps, concrete rubble, blue clay, sod, wood, debris, and other extraneous material.

2.2 FLOWABLE FILL

- A. Where called for on the Drawings certain areas of the excavation and areas of existing structures shall be backfilled with flowable fill.
- B. Flowable fill shall consist of a mixture of fly ash, cement and water such as "C-Fill" as manufactured by Clawson Concrete or "M-Crete" as manufactured by Michigan Foundation or equal.
- C. Cement shall be Portland Cement conforming to A.S.T.M. C 150 Type I. Air entrained cement, pozzolan, and other types of cement shall not be used. Fly ash shall conform to the requirements of A.S.T.M. C618, Class F. Water shall be potable.
- D. The stabilized fly ash mixture shall contain 4 to 5% Portland cement based on the dry weight of the fly ash. Occasional batches of mixture with a cement content of 3-4% will be allowed provided immediate action is taken to restore the cement content to the specified range. Mixtures containing less than 3% shall not be used. The mixture shall have a slump of 10 to 12 inches at the point of placement. The mix temperature shall not be lower than 50°. The mixture shall have a compressive strength of 100 psi minimum at 28 days.
- E. The method used to measure fly ash and cement shall be submitted for acceptance. The contractor's proposed method shall be one that compliments the type of mixing plant being used and provides assurance that the percentage of cement is being satisfactorily controlled. Cement content shall be based on the dry weight of the fly ash in the mix. The batched weight of fly ash shall be corrected for its moisture content. Water shall be measured, although its control will be a function of consistency (slump and workability) of the mix.

- F. The flowable fill may be mixed by a pug mill, central concrete mixer, turbine mixer or other acceptable equipment or method. Provisions shall be made to maintain the mix temperatures and slump as stated.
- G. The material shall be placed by end or side dumping, tremie, pump, conveyors, or other suitable method. Lines and grades shall be as shown on the design drawings. Stabilized fly ash shall be protected from freezing temperatures for the initial 24 hours after placement. Protection may consist of earth cover, straw, or a sacrificial layer of the stabilized fly ash mix.

PART 3 EXECUTION

3.1 EXCAVATIONS

- A. The Contractor shall make all excavation necessary for the construction of all work called for by the drawings or specified herein.
- B. Excavations shall be made to the line and grade shown on the drawings including removal of unsuitable soils from under structures or roads, or as required to meet MIOSHA regulations. Side slopes of unbraced excavations shall be such as to prevent slides which might injure the work. The Contractor shall conduct his excavation and other operations in such a manner as to ensure that the bed for footings and foundations remains free from rutting, trampling, or other undue disturbance. The beds for footings and foundations shall be true to grade and free of all loose material before any concrete is put in place. All unauthorized excavation below grade of any structure shall be backfilled with concrete to the proper grade at the Contractor's expense. The Contractor shall make all necessary fills to bring grade to finished grade shown on the drawings. Fills and cuts shall be graded to a uniform, smooth, and even grade to grades as shown on the Drawings to meet Owner's approval. Existing underground utilities that are to remain in place shall be protected and any damage caused by excavating shall be made good.
- C. Control the grading in the vicinity of excavated areas so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Such areas shall be kept reasonably dry at all times. Accumulated water in the excavated areas shall be removed by pumping.
- D. Broken concrete or rubbish unsuitable for backfill shall be disposed of by the Contractor. Borrow material shall be graded in such a way that surface water will continue to drain in a manner similar to the drainage patterns present before filling occurred. Broken concrete and rubbish shall be disposed of off-site.

3.2 UNAUTHORIZED EXCAVATIONS

- A. Whenever the excavation is carried beyond the lines and grades established by the drawings or as approved by the Owner, the Contractor shall, at his own expense, fill all such excavated space with an approved material and in such a manner as to meet the approval of the Owner.
- B. Unauthorized excavation beneath structures shall be filled with plain concrete, or flowable fill as determined by the Owner.

3.3 SUBGRADE

- A. The subgrade for all structures shall be prepared so as to have as near as practicable a uniform density throughout the entire area. The subgrade shall be compacted to 95% maximum density at optimum moisture content as specified in AASHTO-180 or by Michigan Cone density, whichever is greater, by rolling or by other approved methods. After being prepared, the subgrade shall be maintained until concrete has been placed thereon.
- B. If, through neglect or delay on the part of the Contractor, the earth at subgrade elevation becomes unsuitable for the support of the work to be constructed thereon, the Contractor shall excavate down to solid earth, and shall backfill to the required subgrade elevation with plain concrete, compacted sand, or other suitable material as required to meet the Owner's approval. Unstable subgrade soil under all concrete foundations shall be replaced with plain concrete.
- C. All subgrades shall be approved by the Engineer before proceeding with backfilling and compaction, landscaping, or other construction work.
- D. Subgrades shall be level and clean of all loose rock, dirt, and debris and free of standing water prior to placing concrete.

3.4 SLOPES, SHEETING, AND BRACING

- A. All slopes shall be cut and maintained to the proper degree required for stability. Sheeting and bracing shall be placed and maintained as indicated and/or whenever required for safety to men and the work. The degree of slope for all excavations shall be fixed by the Contractor, and shall comply with all State and Federal safety requirements.
- B. The Contractor shall provide, install, and maintain all shoring, sheet piling, and bracing required to maintain banks of excavations and other construction, and assume full responsibility for same. The design of all shoring systems shall be performed by an Engineer registered in the State of Michigan utilizing loading diagrams as provided in Section 1900 of the Specifications. The shoring system design computations shall be sealed by the Engineer who prepared them and forwarded to the Owner for review.
- C. Sheeting, bracing and timbering shall be so placed as to allow the work to be constructed to the lines and grades shown on the drawings.

Size and placing of members shall be subject to review by the Owner but the design of members and safety of the excavation shall be the responsibility of the Contractor.

Exact areas to be sheet piled and final weight of sheet piling shall be determined by the Contractor unless otherwise indicated for permanent sheet piling. Actual quantity and location of all sheet piling required for this project shall be determined by the Contractor.

- D. The Contractor shall select hammer or hammers to be used on sheet piling based on length, weight, type of pile, and depth of penetration and submit data on the hammer selected to the Owner for review. Double-acting hammers may be used on sheet piling.

Approximate weight of hammer shall be 2-1/2 times the weight of a sheet of piling to be driven.

- E. Sheet piling shall be driven to depths and lengths required by the Contractor unless otherwise indicated for permanent sheet piling. Level measurements, utilizing previously specified bench marks, shall also be made at existing structures, in the presence of the Owner's designated representative, during all driving of sheet piling to record any change in the level of present structures or utilities caused by the Contractor's Operations.
- F. Permanent sheet piling where indicated on the drawings shall be of weight, area and depth shown on the drawings and shall remain in place.
- G. Temporary sheet piling may not be withdrawn from any area until concrete within the zone influenced by vibrations set up by withdrawal operations, has attained its 28 day design strength.
- H. If the sheeting and bracing cannot be removed without detriment to the finished structure or existing structures, then the sheeting and bracing shall be left in place temporarily or permanently as the Owner shall approve. Sheeting and bracing left in place permanently shall be cut off at the required level so as not to interfere with subsequent construction. The cost of materials left in place less the eliminated expense of removal work shall be paid as an extra. No extra payment shall be allowed for the cost of placing the material.
- I. All bracing used shall be so arranged as to place no stress on any portion of the completed work until such work shall have developed sufficient strength, as determined by the Owner. Any damage to any structures occurring through settlements, water or earth pressure, slides, cave-ins, or other causes shall be repaired by the Contractor at his own expense.

All materials used for earth bracing or support shall be structurally sound, uniform in quality, and adequate in size and strength for the use intended.

3.5 BACKFILL AND COMPACTION

- A. It is the intent of these Specifications that backfill shall be so placed and consolidated that no appreciable subsequent settlement will occur.
- B. Backfill shall be placed in uniform layers not exceeding 12 inches in depth when measured loose and each layer shall be thoroughly compacted by tamping, sheepsfoot-roller, mechanical vibrators, or by other effective means approved by the Owner. All backfill in all areas shall be compacted to at least 95% of maximum density, at optimum moisture content as specified in MDOT Standard Specifications for Construction Controlled Density Method. Compaction by flooding will not be permitted.

The Owner shall have the right to reject any backfill material which when used in the work, does not accomplish the required compaction.

- C. The Contractor shall furnish all necessary assistance and test pits as required for the Owner to conduct compaction density tests.

- D. No backfill material shall be placed on areas where free water is standing or on frozen subsoil areas.
- E. Clean areas and excavations to be backfilled of all trash and debris before placement of backfill. In placing backfill, take special care to prevent any wedge action, eccentric loading, damage, or overloading of any adjacent structures, piping, and equipment by equipment used in compacting backfill material.
- F. Heavy equipment for spreading and compacting fill and backfill shall not be operated closer to a wall than a distance equal to the height of the fill or backfill to be placed. Power-driven hand operated equipment shall be used against walls and where space limits the use of heavy equipment.
- G. All excavations around the walls and other foundations, etc., shall be backfilled to meet Owner approval after all work has been inspected and approved. Backfill shall not be placed against walls until all supporting slabs are in place and have attained their design strength or as indicated on the structural drawings.
- H. If compaction tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.
- I. Porous stone filters shall be furnished and installed where shown on the Drawings. Stone filters shall be encased in a drainage geotextile fabric as specified in Section 02202 of these specifications.

3.6 FINISH GRADING

- A. The Contractor shall grade the entire site as indicated on the drawings to a smooth and even grade, meeting existing grades and/or the grades indicated on the drawings.
- B. Excavated material suitable and approved for backfilling shall be stored on the site in areas approved by the Owner. Reusable topsoil that is displaced shall also be stored on the site in separate area from the backfill.
- C. Finish grade under gravel road areas and under paved areas shall be limited to 1/2 inch in 10 feet from true profile, and shall be maintained until succeeding layer or surface course is placed.
- D. Finish grading shall slope uniformly to contour lines shown on the Drawings, and to meet existing adjacent levels. The Contractor shall grade all areas within his work site and provide slopes, shoulders, berms, and level surfaces defined according to existing and established grades. The work shall also include all adjacent areas disturbed by construction and as required by new pavement installation.
- E. The subgrade for all slabs and pavements shall be prepared so as to have as near as practicable a uniform density throughout the entire area. The subgrade shall be compacted to 95% maximum density at optimum moisture content, as specified under BACKFILL AND COMPACTION herein, by rolling or by other approved methods. After being prepared, the subgrade shall be maintained until concrete or pavement has been placed thereon.

- F. If, through neglect or delay on the part of the Contractor, the earth at subgrade elevation becomes unsuitable for the support of the work to be constructed thereon, the Contractor shall excavate down to solid earth, and shall backfill to the required subgrade elevation with plain concrete, or other suitable material as required to meet the Owner's approval.

Soil found to be unstable in the subgrade shall, when required to meet the Owner's approval, be excavated to firm soil and replaced with MDOT Granular Material, Class II, as specified above thoroughly compacted. Subgrade area supporting structures shall have unstable material replaced with Owner approved concrete.

- G. Refer to Section 02958 - Special Landscaping Requirement for Site.

3.7 INSTALLATION OF PERIMETER DRAINS

- A. Install at locations where drains are shown on Contract Drawings.
- B. Install aggregate and filter cloth as shown on details on Contract Drawings.
- C. Compact aggregate as specified and complete filter cloth installation prior to completion of backfill.

END OF SECTION

SECTION 02214

ROADWAY EXCAVATION, BACKFILL, AND COMPACTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. General excavation, backfill, and compaction are specified under Section 02200. This specification details additional requirements for roadway excavation, backfill, and compaction.
- B. Related Work Specified Elsewhere:
 - 1. Section 01900 - Soil Conditions and Boring Logs.

1.2 SUBMITTALS

- A. Source of Materials: Submit the source of fill and granular materials proposed for the work, giving location, and as applicable, name and address of supplier.
- B. Samples: Submit samples of soil material proposed for fill or backfill to the testing laboratory services for soil classification tests.

1.3 JOB CONDITIONS

- A. Excess Water Control:
 - 1. Provide and maintain, at all times during construction, adequate means and devices which will promptly remove and dispose of all water from any source entering any area of the work.
 - 2. Dewater by means which will ensure dry work areas and preservation of the final lines and grades.
 - 3. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collecting in depressions.
 - 4. If soil becomes softened or eroded by flooding, remove all damaged areas and recompact as specified under "Preparation of Roadway Subgrade."
- B. Environmental Requirements:
 - 1. Do not place, spread, or compact any fill or subbase materials during unfavorable weather conditions.
 - 2. Do not resume operations until moisture content and densities of fill and subbase materials are satisfactory to the Engineer.
- C. Protection:
 - 1. Provide and maintain barricades, warning signs, warning lights, and other protection required by applicable laws, regulations and safety codes for safety of persons and protection of property during roadway excavation, backfill, and compaction operations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Class 2 Granular Material:
 - 1. Approved sand, gravel, crushed stone, blast-furnace slag or combination thereof, with 100 percent passing 3-inch sieve, 60 to 100 percent passing 1-inch sieve, 0 to 30 percent passing No. 100 sieve, and loss by washing not to exceed seven percent.
 - 2. MDOT Standard Specifications 8.02.06 Granular Material Class II.

2.2 EQUIPMENT

- A. Excavation, aggregate spreading and compaction equipment shall be of type necessary to achieve the indicated and specified results.

PART 3 EXECUTION

3.1 INSPECTION

- A. Site Conditions: Prior to start of work under this Section, become thoroughly familiar with site conditions to verify that all work under this Section may be properly completed as specified.

3.2 EXCAVATION

- A. Excavation shall include removal, hauling, and disposal of all classes of materials and obstructions encountered while excavating of whatever nature and in whatever state.
- B. Excavate all materials necessary for construction of a prepared roadway subgrade to the elevations and cross-sections indicated on the Drawings.
- C. Excavation shall at all times be performed in a manner and sequence that will provide drainage.
- D. Excavated material meeting requirements specified for Fill Material may be used to construct embankments and fills.
- E. Excavated material unsuitable for reuse shall be disposed of by the Contractor offsite.
- F. Excess excavated material suitable for fill shall be disposed of and any shortage shall be made up with approved borrow.
- G. Preparation of roadway subgrade:
 - 1. All areas shall be compacted to not less than 95 percent of maximum density as determined by the Modified Proctor Test method unless otherwise specified.
 - 2. Any material within lines two feet outside the proposed surfacing that cannot be compacted to 95 percent of maximum density as determined by the Modified Proctor Test method shall be removed.

3. After removal of unsuitable material, where possible, 6 inch perforated clay drainage tile shall be placed from the low point of excavated area to a natural drainage course, ditch or storm sewer structure. The excavated area shall then be backfilled with an approved porous material.
4. Where an outlet for drainage tile is not available and the surrounding earth is impervious, the backfill shall be made with clay free from silt and topsoil.

3.3 EMBANKMENTS AND FILLS

- A. Filling: After subgrade compaction has been approved by the Engineer, Fill Material or Class 2 Granular Material shall be spread in layers not to exceed six inches for clay and 12 inches for sand. When embankments are to be constructed on existing slopes steeper than one vertical to six horizontal, steps shall be formed in the slope before fill is placed.
- B. Embankments shall not be constructed on frozen earth, ice, snow, topsoil, muck or other unstable material.
- C. Moisture Conditioning: Water or aerate the material as necessary and thoroughly mix to obtain a moisture content which will permit proper compaction.
- D. Compaction: Each layer of embankment and fill material shall be compacted to 95 percent of maximum density as determined by the Modified Proctor Test.

3.4 CLEANING

- A. Make every effort to keep roadways free from waste material resulting from earthwork operations. Clean such surfaces as required, or when directed, to eliminate any waste material deposited.

END OF SECTION

SECTION 02220

SOIL EROSION CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This specification section provides certain requirements, techniques and measures to minimize erosion damage to the construction site.

1.2 GENERAL

- A. In general, the Contractor shall conduct his operations in such a manner as to limit any exposed area of any disturbed land for the shortest practicable period of time and any sediment caused by soil erosion due to his operations shall be restricted and reduced to a non-polluting minimum before it leaves the site.
- B. The Contractor shall comply with all requirements under the Soil Erosion and Sedimentation Control Act, 1972 Public Act 347. Where these specifications are more stringent than Act 347 then these specifications shall govern.
- C. All temporary stabilization work done shall be coordinated with Section 02930 – General Landscape Materials and Final Grading for site so that this work does not interfere with the final site restoration.

1.3 RELATED SECTIONS

- A. Section 02110 - Site Clearing
- B. Section 02200 – Earthwork
- C. Section 02211 - Rough Grading
- D. Section 02930 - General Landscape Materials and Final Grading
- E. Section 02970 – Landscape Maintenance and Guarantee Standards
- F. Section 02990 - Permits

1.4 INLAND LAKES AND STREAMS ACT

- A. All waterway crossings are subject to the provisions of the Inland Lakes and Streams Act, 1972 Public Act 346, as amended and Administrative Rules. The Contractor shall obtain the latest version of these regulations for use on this project as reference material. Special attention is directed to applicable portions of Rules 22 through 29, inclusive. The Contractor's activities shall adhere to the provisions of this act and the Contractor shall hold the Owner harmless from any violations, civil action or penalties arising from the Contractor's actions.

1.5 BASIS OF PAYMENT

- A. All costs associated with the above stated requirements shall be considered incidental to the project and shall be included in the bid.
- B. The Owner shall obtain the necessary Soil Erosion and Sedimentation Control Permit and the Wetlands Permit from the State of Michigan with no cost to the Contractor.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Refer to the following Table 1 for stabilization materials and seasons for use. Also, coordinate this work with Section 02930 – General Landscape Materials and Final Grading so that any soil stabilization done does not interfere with the final site restoration.

TABLE I
MATERIALS FOR STABILIZATION
OF CONSTRUCTION AREAS

<u>Material</u>	<u>Amount</u>	<u>Season</u>
Spring Oats or Barley or Domestic Rye Grass	25 lbs/acre	April 1 to Aug. 15
or Sudan Grass	35 lbs/acre	June & July
or Rye or Perennial Ryegrass	25 lbs/acre	Aug. 1 to Oct. 15
or Wheat	25 lbs/acre	Sep. 20 to Oct. 15
	2.5 bus/acre	
Fertilizer: 12-12-12 Commercial	600 lbs/acre	Seeding Season
Mulch: Sm. grain Straw		All Year
Hay	2 tons/acre	
Spray Coating: Liquid Asphalt RC 1, 2, or 3 MC 2 or 3	0.10 gal/s.y.	All Year

<u>Material</u>	<u>Amount</u>	<u>Season</u>
Asphalt Emulsion: RC 1 or 2 MC 2	0.04 gal/s.y.	Spring & Fall
Mulch: Kraft Paper	Cover Area	All Year
Netting:	See Mulching Section	
Top Soil for Permanent Seed:	3"	Seeding Season
Top Soil for Sod:	3"	Sodding Season
Sod: MDOT 8.21 Class B	1-1/2" x 10" x 18" min.	May 1 to Oct. 20
Pegs: Sound Wood	8" long (min.) 0.75 sq. in. (min.)	

PART 3 EXECUTION

3.1 EROSION PROTECTION-CROSSING DRAINS/STREAMS

- A. In order to limit the length of time that the exposed area is subject to the elements and the subsequent conditions causing erosion, the contractor shall adhere to the following requirements.
1. The banks of drains will not be left unprotected for more than one day where possible, but never more than seven days. Construction will not be allowed to continue at the expense of not providing stream bank protection. All spoils including organic and inorganic soils, vegetation and debris shall be placed above the ordinary high water mark, leveled and stabilized with sod and/or seed, fertilized and mulched, in such a manner as not to erode into any waterbody or wetland.
 2. All disturbed drain banks will be finished with a slope not steeper than 2:1 (2 horizontal to 1 vertical) and in accordance with grading plans. Fill shall consist of inert materials which will not cause siltation nor contain soluble chemicals or organic matter which is biodegradable. All fill shall be contained in such a manner as not to erode into any watercourse. All raw banks shall be stabilized with sod, seed, fertilizer and mulch or riprapped as necessary to prevent erosion.
 3. All raw soil will be either sodded or seeded, fertilized and mulched. On slopes greater than 10 percent, sod will be pegged for stability.
 4. Deflection dikes consisting of gravel or other suitable material, reinforced by one row of sandbags, will be used to divert runoff from steep slopes adjacent to water courses,

where contributing runoff could be great enough to cause slope erosion and resulting sedimentation at the ditch. Diversion berms, filter berms, diversion ditches or terracing may be appropriate.

5. Excavation shall stop some distance from ditches to leave a protective plug of 10 to 20 feet of unexcavated material at each bank. These plugs shall be left in place.
- B. Any unforeseen situations that may be encountered during the course of construction, that may cause accelerated erosion and deposition of sediment into waterways and/or lakes, will be controlled by methods that may include sediment traps, sediment basins, or holding ponds. Any slope failures or development of gullies after construction has been completed will be corrected immediately.

3.2 EROSION PROTECTION-OPEN CUT CONSTRUCTION

- A. In order to limit the length of time that the exposed area is subject to the elements and subsequent conditions causing erosion, the Contractor shall adhere to the following requirements.
1. Burlap Silt Traps (or equivalent) shall be placed between the frame and cover of all manholes, catch basins, and gate wells in the construction area. The burlap shall be periodically replaced if silt buildup causes the trap to function improperly.
 2. Underground piping and conduit construction, including installation of pipe, backfilling, surface restoration and removal of excess excavation shall be accomplished in one continuous operation. Backfilling, removal of excess excavated material and final or temporary stabilization (according to seasonal limitation) shall follow pipe laying and conduit construction by no more than 100 feet.
 3. Excess excavated materials shall be removed from the job site. Excess excavated material shall be disposed of in accordance with Section 02200-Earthwork. A soil erosion plan must be prepared by the Contractor for each fill area and it shall be approved by a proper authorized agency and implemented before starting filling operations.

3.3 APPLICATION OF PERMANENT STABILIZATION

- A. Permanent stabilization shall be applied to all areas disturbed by the Contractor during completion of the work required by the Contract.
- B. The stabilization shall be accomplished within 7 days of completion of the final earth change provided that change is made within the stated season for such stabilization.
- C. If the final earth change is accomplished at a time outside of the stated seeding or sodding season, temporary stabilization shall be applied within 7 days of completion of the final earth change and shall be replaced with permanent stabilization as soon after the following April 20 as the ground is workable.

3.4 APPLICATION OF TEMPORARY STABILIZATION

- A. Temporary stabilization shall be applied to areas where initial work has caused disturbance and the final earth change will not be completed immediately and to areas where the final earth change is completed between October 1 and April 20.

- B. Temporary stabilization shall be applied to areas where the final earth change has been completed, including final grading and top soil placement, between the dates of October 1 and April 20. The disturbed areas shall have mulch placed and anchored as described in the following paragraphs. After April 20, areas to be seeded shall be seeded through the mulch. Mulch shall be added and anchored as necessary to replace that lost prior to April 20. Where sod is to be placed, the mulch will be removed or worked into the soil. If worked into the soil, the fertilizer application rate shall be increased by 25%.
- C. Areas disturbed by construction activities but on which the final earth change has not been made shall be graded to provide positive drainage and shall be stabilized to prevent erosion.
- D. Areas which receive an initial earth change during the period October 15 to April 1 and will not receive further work for any length of time within that season shall have mulch placed and anchored. If work is not anticipated in such areas prior to the following July 1, the area shall be seeded with temporary seeding on or shortly after April 1.
- E. Areas which receive an initial earth change between April 1 and October 15 and on which no further work is anticipated within 3 months shall receive temporary seeding and mulch.
- F. Areas which receive an initial earth change and on which further work is to be done within 3 months shall be graded to provide positive drainage and shall have mulch placed and anchored.

3.5 SEEDING FOR TEMPORARY AND PERMANENT STABILIZATION

- A. Site Preparation
 - 1. The seedbed immediately before seeding shall be firm but not so compact as to prohibit the seed from securing adequate germination or root penetration. Topsoil shall be replaced after grading operations for permanent stabilization. No topsoil is required for temporary stabilization. Tillage implements shall be used as necessary to provide at least a 3 inch depth of firm but friable soil, free of large clods and stones and other debris. All seeding shall be protected by mulching. See Sections 02200 and 02930 of these specifications for details of permanent stabilization which include spreading topsoil, seeding, fertilizing, mulching, establishment and guarantee. Mulching work shall also be included in temporary stabilization.
- B. Seeding Dates
 - 1. Seed shall be applied from April 20 to October 1 for permanent stabilization and from April 1 to October 15 for temporary stabilization and the seeded areas shall be kept moist for fourteen (14) days to insure growth. If the site is readied for seeding during non-seeding months, it shall be protected by mulching. The site can be seeded later through the mulch. Seeding shall not be done on frozen soil or if the soil is snow covered.
- C. Seedings
 - 1. Seed in a moist firm seedbed. Place seed from 1/4 to not over 1/2 inch in depth. See Table No. 1 for seeding mixture.
- D. Irrigation

1. The Contractor shall apply water to the new seedlings daily in order to insure that the seed bed is moist enough to allow germination and growth of the seeds.

3.6 SOD FOR PERMANENT STABILIZATION

A. Site Preparation

1. Fill areas must be compacted enough to resist uneven settling. Cut areas must be loosened if needed to permit grass root penetration. The entire surface to be sodded shall be free from large clods, stones, or other debris. Immediately before placing sod the soil surface shall be loosened to a depth of one inch and thoroughly dampened if not already moist.
2. See Sections 02200 and 02930 of these specifications for sodding details which include type of sod, fertilizing, sod laying, establishment and guarantee.

B. Sodding Dates

1. Sod shall be applied from May 1 until October 20 and properly irrigated. Frozen sod shall not be placed nor shall any sod be placed on frozen soil. During periods when sod cannot be laid, temporary stabilization methods shall be applied.

C. Irrigation

1. The Contractor shall apply water to the new sod daily in order to insure that the sod is moist enough to allow growth.

END OF SECTION

SECTION 02512

HMA ACCEPTANCE

PART 1 GENERAL

1.1 DESCRIPTION

- A. This special provision provides sampling and testing requirements for local agency projects using the roller method and the nuclear density gauge testing. Provide the hot mix asphalt (HMA) mixture in accordance with the requirements of the standard specifications, except where modified herein.

1.2 MATERIALS

- A. Provide aggregates, mineral filler (if required), and asphalt binder to produce a mixture proportioned within the master gradation limits shown in the contract, and meeting the uniformity tolerance limits in Table 1.

Table 1: Uniformity Tolerance Limits for HMA Mixtures

Parameter		Top and Leveling Course		Base Course	
Number	Description	Range 1 (a)	Range 2	Range 1 (a)	Range 2
1	% Binder Content	-0.30 to +0.40	±0.50	-0.30 to +0.40	±0.50
2	% Passing	# 8 and Larger Sieves	±5.0	±8.0	±7.0
		# 30 Sieve	±4.0	±6.0	±6.0
		# 200 Sieve	±1.0	±2.0	±2.0
3	Crushed Particle Content (b)	Below 10%	Below 15%	Below 10%	Below 15%
<p>a. This range allows for normal mixture and testing variations. The mixture must be proportioned to test as closely as possible to the Job-Mix-Formula (JMF).</p> <p>b. Deviation from JMF.</p>					

- B. Parameter number 2 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve is exceeding Range 1 or Range 2 tolerances, only the one with the largest exceedance will be counted as the gradation parameter.
- C. The master gradation should be maintained throughout production; however, price adjustments will be based on Table 1. Aggregates which are to be used in plant-mixed HMA mixtures must not contain topsoil, clay, or loam.

1.3 CONSTRUCTION

- A. Submit a Mix Design and a JMF to the Engineer. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the JMF. Maintain the binder content, aggregate gradation, and the crushed particle content of the HMA mixture within the Range 1 uniformity tolerance limits in Table 1. For mixtures meeting the definition of top or leveling course, field regress air void content to 3.5 percent with liquid asphalt cement unless specified otherwise on HMA application estimate. For mixtures meeting the definition of base course, field regress air void content to 3.0 percent with liquid asphalt cement unless specified otherwise on HMA application estimate.
- B. Ensure all persons performing Quality Control (QC) and Quality Assurance (QA) HMA field sampling are "Local Agency HMA Sampling Qualified" samplers. At the Pre-Production or Pre- Construction meeting, the Engineer will determine the method of sampling to be used. Ensure all sampling is done in accordance with *MTM 313 (Sampling HMA Paving Mixtures)* or *MTM 324 (Sampling HMA Paving Mixtures Behind the Paver)*. Samples are to be taken from separate hauling loads.
- C. For production/mainline type paving, obtain a minimum of two samples, each being 20,000 grams, each day of production, for each mix type. The Engineer will sample and maintain possession of the sample. Sampling from the paver hopper is prohibited. Each sample will be divided into two 10,000 gram parts with one part being for initial testing and the other part being held for possible dispute resolution testing. Obtain a minimum of three samples for each mix type regardless of the number of days of production.
- D. Obtain samples that are representative of the day's paving. Sample collection is to be spaced throughout the planned tonnage. One sample will be obtained in the first half of the tonnage and the second sample will be obtained in the second half of the tonnage. If planned paving is reduced or suspended, when paving resumes, the remaining sampling must be representative of the original intended sampling timing.
- E. Ensure all persons performing testing are Bit Level One certified or Bit QA/QC Technician certified.
- F. Ensure daily test samples are obtained, except, if the first test results show that the HMA mixture is in specification, the Engineer has the option of not testing additional samples from that day.
- G. At the Pre-Production or Pre-Construction meeting, the Engineer and Contractor will collectively determine the test method for measuring asphalt content (AC) using *MTM 319 (Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method)* or *MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures)*. Back calculation will not be allowed for determining asphalt content.
- H. Ensure all labs performing local agency acceptance testing are qualified labs per the *HMA Production Manual* and participate in the MDOT round robin process, or they must be *AASHTO Materials Reference Laboratory (AMRL)* accredited for *AASHTO T 30* or *T 27*, and *AASHTO T 164* or *T 308*. Ensure on non-National Highway System (NHS) routes, Contractor labs are made available, and may be used, but they must be qualified labs as previously stated. Contractor labs may not be used on NHS routes. Material acceptance

testing will be completed by the Engineer within 14 calendar days, except holidays and Sundays, for projects with less than 5,000 tons (plan quantity) of HMA and within 7 calendars days, except holidays and Sundays, for projects with 5,000 tons (plan quantity) or more of HMA, after the Engineer has obtained the samples. QA test results will be provided to the Contractor after the Engineer receives the QC test results. Failure on the part of the Engineer or the laboratory to provide Quality Assurance test results within the specified time frame does not relieve the Contractor of their responsibility to provide an asphalt mix within specifications.

- I. The correlation procedure for ignition oven will be established as follows. Asphalt binder content based on ignition method from MTM 319. Gradation (*ASTM D 5444*) and Crushed particle content (*MTM 117*) based on aggregate from *MTM 319*. The incineration temperature will be established at the Pre-Production Meeting. The Contractor will provide a laboratory mixture sample to the acceptance laboratory to establish the correction factor for each mix. Ensure this sample is provided to the Engineer a minimum of 14 calendar days prior to production.
- J. For production/mainline type paving, the mixture may be accepted by visual inspection up to a quantity of 500 tons per mixture type, per project (not per day). For non-production type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage.
- K. The mixture will be considered out-of-specification, as determined by the acceptance tests, if for any one mixture, two consecutive tests per parameter, (for Parameter 2, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. Consecutive refers to the production order and not necessarily the testing order. Out-of- specification mixtures are subject to a price adjustment per the Measurement and Payment section of this special provision.
- L. Contractor operations will be suspended when the mixture is determined to be out-of-specification, but contract time will continue to run. The Engineer may issue a Notice of Non- Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. Submit a revised JMF or proposed alterations to the plant and/or materials to achieve the JMF to the Engineer. Effects on the Aggregate Wear Index (AWI) and mix design properties will be taken into consideration. Production and placement cannot resume until receipt of the Engineer's approval to proceed.
- M. Pavement in-place density will be measured using one of two approved methods. The method used for measuring in-place density will be agreed upon at a pre-production or pre-construction meeting.
- N. Pavement in-place density tests will be completed by the Engineer during paving operations and prior to traffic staging changes. Pavement in-place density acceptance testing will be completed by the Engineer prior to paving of subsequent lifts and being open to traffic.
- O. Option 1 – Direct Density Method

1. Use of a nuclear density gauge requires measuring the pavement density using the Gmm from the JMF for the density control target. The required in-place density of the HMA mixture must be 92.0 to 98.0 percent of the density control target. Nuclear density testing and frequency will be in accordance with the *MDOT Density Testing and Inspection Manual*.

P. Option 2 – Roller Method

1. The Engineer may use the Roller Method with a nuclear or non-nuclear density gauge to document achieving optimal density as discussed below.
2. Use of the density gauge requires establishing a rolling pattern that will achieve the required in- place density. The Engineer will measure pavement density with a density gauge using the Gmm from the JMF for the density control target.
3. Use of the Roller Method requires developing and establishing density frequency curves, and meeting the requirements of Table 2. A density frequency curve is defined as the measurement and documentation of each pass of the finished roller until the in-place density results indicate a decrease in value. The previous recording will be deemed the optimal density. The Contractor is responsible for establishing and documenting an initial or QC rolling pattern that achieves the optimal in-place density. When the density frequency curve is used, the Engineer will run and document the density frequency curve for each half day of production to determine the number of passes to achieve the maximum density. Table 5, located at the end of this special provision, can be used as an aid in developing the density frequency curve. The Engineer will perform density tests using an approved nuclear or non-nuclear gauge per the manufacturer's recommended procedures.

Table 2: Minimum Number of Rollers Recommended Based on Placement Rate

Average Laydown Rate, Square Yards per Hour	Number of Rollers Required (a)	
	Compaction	Finish
Less than 600	1	1 (b)
601 - 1200	1	1
1201 - 2400	2	1
2401 - 3600	3	1 4.
3601 and More	4	1
a. Number of rollers may increase based on density frequency curve. b. The compaction roller may be used as the finish roller also.		

5. After placement, roll the HMA mixture as soon after placement as the roller is able to bear without undue displacement or cracking. Start rolling longitudinally at the sides of the lanes and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the drum. Ensure each required roller is 8 tons minimum in weight unless otherwise approved by the Engineer.
6. Ensure the initial breakdown roller is capable of vibratory compaction and is a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 miles per hour (mph) or 4.5 feet per second. Ensure all

compaction rollers complete a minimum of two complete rolling cycles prior to the mat temperature cooling to 180 degrees Fahrenheit (F). Continue finish rolling until all roller marks are eliminated and no further compaction is possible. The Engineer will verify and document that the roller pattern has been adhered to. The Engineer can stop production when the roller pattern is not adhered to.

1.4 MEASUREMENT OF PAYMENT

- A. The completed work, as described, will be measured and paid for using applicable pay items as described in subsection 501.04 of the Standard Specifications for Construction, or the contract, except as modified below.
- B. Base Price. Price established by the Department to be used in calculating incentives and adjustments to pay items and shown in the contract.
- C. If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 1, but not the Range 2, tolerance limits, that mixture parameter will be subject to a 10 percent penalty. The 10 percent penalty will be assessed based on the acceptance tests only unless the Contractor requests that the 10,000 gram sample part retained for possible dispute resolution testing be tested. The Contractor has 4 calendar days from receipt of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractor's QC test results for the corresponding QA test results must result in an overall payment greater than QA test results otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the lab once dispute resolution testing is requested. The dispute resolution sample will be sent to an independent lab selected by the Local Agency, and the resultant dispute test results will be used to determine the penalty per parameter, if any. Ensure the independent lab is a MDOT QA/QC qualified lab or an AMRL HMA qualified lab. The independent lab must not have conflicts of interest with the Contractor or Local Agency. If the dispute testing results show that the mixture parameter is out-of-specification, the Contractor will pay for the cost of the dispute resolution testing and the contract base price for the material will be adjusted, based on all test result parameters from the dispute tests, as shown in Table 3 and Table 4. If the dispute test results do not confirm the mixture parameter is out-of-specification, then the Local Agency will pay for the cost of the dispute resolution testing and no price adjustment is required.
- D. If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 2 tolerance limits, the 10,000 gram sample part retained for possible dispute resolution testing will be sent, within 4 calendar days, to the MDOT Central Laboratory for further testing. The MDOT Central Laboratory's test results will be used to determine the penalty per mixture parameter, if any. If the MDOT Central Laboratory's results do not confirm the mixture parameter is out-of-specification, then no price adjustment is required. If the MDOT Central Laboratory's results show that the mixture is out-of-specification and the Engineer approves leaving the out-of-specification mixture in place, the contract base price for the material will be adjusted, based on all parameters, as shown in Table 3 and Table 4.

- E. In the case that the Contractor disputes the results of the test of the second sample obtained for a particular day of production, the test turn-around time frames given would apply to the second test and there would be no time frame on the first test.
- F. The laboratory (MDOT Central Laboratory or independent lab) will complete all Dispute Resolution testing and return test results to the Engineer, who will provide them to the Contractor, within 13 calendar days upon receiving the Dispute Resolution samples.
- G. In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification.

Table 3: Penalty Per Parameter

Mixture Parameter out-of-Specification per Acceptance Tests	Mixture Parameter out-of-Specification per Dispute Resolution Test Lab	Price Adjustment per Parameter
NO	N/A	None
YES	NO	None
	YES	Outside Range 1 but not Range 2: decrease by 10%
		Outside Range 2: decrease by 25%

- H. The quantity of material receiving a price adjustment is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.
- I. Each parameter of Table 1 is evaluated with the total price adjustment applied to the contract base price based on a sum of the two parameter penalties resulting in the highest total price adjustment as per Table 4. For example, if three parameters are out-of-specification, with two parameters outside Range 1 of Table 1 tolerance limits, but within Range 2 of Table 1 limits and one parameter outside of Range 2 of Table 1 tolerance limits and the Engineer approves leaving the mixture in place, the total price adjustment for that quantity of material is 35 percent.

Table 4: Calculating Total Price Adjustment

Cost Adjustment as a Sum of the Two Highest Parameter Penalties		
Number of Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%
Two	Range 1 & Range 1	20%
	Range 1 & Range 2	35%
	Range 2 & Range 2	50%
Three	Range 1, Range 1 & Range 1	20%
	Range 1, Range 1 & Range 2	35%
	Range 1, Range 2 & Range 2	50%
	Range 2, Range 2 & Range 2	50%

Table 5: Density Frequency Curve Development

Tested by: _____ Date/Time: _____

Route/Location:		Air Temp:
Control Section/Job Number:		Weather:
Mix Type:	Tonnage:	Gauge:
Producer:	Depth:	Gmm:

Roller #1 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #2 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #3 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Summary: _____

CITY OF MUSKEGON
OFFICE OF THE CITY ENGINEER

STANDARD CONSTRUCTION SPECIFICATIONS

DIVISION 13
WATERMAINS

Approved by the City Commission
February 09, 2010

DIVISION 13
WATERMAIN

13.01.01 General

As used herein, watermains shall be considered to mean all pipes, conduits, and all necessary appurtenances to transport water, lying within public rights-of way or easements. All materials outlined in this Division shall be manufactured in the United States or be otherwise approved by the City Engineer.

13.01.02 Scope

The Contractor shall, unless otherwise noted, furnish all materials, equipment, tools and labor necessary to accomplish the work required under this contract in a safe and reliable manner, and all contract items are to be placed in proper operating conditions in full conformity with the contract and proposal, detail drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer and materials as approved by the engineer.

13.01.03 Location

The location, grade and the approximate depth of the proposed watermain is shown on the plans with line and grade to be provided by the City of Muskegon unless otherwise noted. The Engineer reserves the right to make minor changes in alignment, grade and location of appurtenances, when such changes deemed necessary or advantageous. Major changes will be accomplished as described in Part 3, Section 1 Item 39 page 45 of the City of Muskegon Standard Contract.

13.01.04 Clean-Up

Surplus materials and appurtenances furnished by the City shall be delivered by the Contractor to the Public Service Building. Confirmation and/or receipts should be obtained from the Stockroom Manager and reported to the Project Inspector. All other surplus construction material shall be removed from the site by the Contractor. Trench backfill and surface replacement shall follow pipe laying operations so that the extent of open trench shall not exceed 500 feet, unless specific authorization is obtained from the Engineer. The finished site shall be free of debris and neat appearance.

13.01.05 Contractors "Notice to Proceed"

After receiving the "Notice to Proceed" the contractor shall give the City Engineer a minimum of 48 hours notice of start to allow for survey layout and assignment of inspection personnel. Whenever work is to be done by City forces or co-ordination with City forces, the contractor shall provide a minimum of 48 hours advance notice to the department from which the work is requested.

DIVISION 13
WATERMAIN

13.02 MATERIALS

13.02.01 General

All materials furnished by the Contractor must conform in all respects to the following standards and must be NSF 61 approved. (Where reference specifications are used, they shall be considered as referring to the latest revised issue).

The Contractor shall be responsible for all material furnished and shall replace, at his own expense, all such material found defective during the life of the contract. For material furnished by the City of Muskegon, the Contractor shall become responsible from the time of delivery, and shall reject any defective materials within three calendar days of delivery, and such materials shall be replaced by the City. Any defective material furnished by the City and installed by the Contractor without discovery of such defect will, if found defective prior to final acceptance, be replaced with sound material by the owner. The Contractor, however, shall at his own expense, furnish all labor, equipment and supplies necessary to facilitate the above replacement.

The Contractor shall furnish to the Engineer a manufacturer's certification that all materials meet minimum requirements as detailed in the material specifications references (refer to paragraph 13.02.02). The Contractor's unit prices will be assumed to include an allowance for this responsibility.

All pipe and related items shall be stored as recommended by the manufacturer, on suitable timber skids free from contact with the ground. Gaskets shall be stored in as cool, clean and shaded a place as practicable.

Unloading shall be made so as to avoid damage to the castings or pipe. Under no circumstances shall materials be dropped. All special handling equipment and temporary supports shall be furnished by the Contractor.

No damaged or broken pipe shall be used, no damaged or broken cement lining in pipe or fittings shall be used, In the event coatings are damaged, the damaged area shall be recoated with an approved coating, at the Contractors expense, in a manner approved by the Engineer.

The watermain pipe shall be handled by means of slings. No hooks or loader forks shall be permitted to come in contact with joint rings or be inserted in the ends of the pipe and fittings for any reason.

Any material found defective or flawed during the progress of work will be rejected and removed from the site. No attempt will be made to repair defective materials without written consent of the Engineer.

DIVISION 13
WATERMAIN

13.02.02 Watermain Specification Reference

- (a) Ductile Iron, Push-On Joint Pipe, 3”– 64” ANSI/AWWA C151/A21.51-09
- (b) Push-On Joint Detail, ANSI / AWWA C111 / A21.11-12
- (c) Ductile Iron, Mechanical Joint Pipe, 3”– 24” ANSI/AWWA C151/A21.51-09
- (d) Mechanical Joint Detail, ANSI / AWWA C111 / A21.11-12
- (e) Cement Lining, ANSI / AWWA C104 / A21.4-13 (Standard Thickness)
- (f) Ductile Iron Pipe Wall Thickness Determination, ANSI/AWWA C150/A21.50-14
- (g) Ductile Iron, Flanged Joint Pipe, 3”– 64” ANSI/AWWA C111/A21.11-12 and ANSI/AWWA C151/A21.51-09
- (h) Mechanical Joint Fittings, ANSI / AWWA C153 / A21.53-11 and ANSI/AWWA C111/A21.11-12
- (i) Push-On Joint Fittings, ANSI / AWWA C110 / A21.10-12 and ANSI/AWWA C111/A21.11-12
- (j) Flanged Fittings, ANSI/AWWA C110/A21.10-12
- (k) Flanges, ASA-B16.1 Standard Class 125
- (l) Copper Pipe, ASTM Spec B88-55 “Type K”
- (m) Retainer Glands EBAA MEGALUG 1100 Series or Equal
- (n) Fire Hydrants, ANSI/AWWA C502-14

13.02.03 Provisions for Electrical Thawing

(a) Serrated Silicon Bronze Wedges

Two per joint for 3” through 12” pipe, four for larger pipe. Each wedge is to be driven into the opening between the plain end and the bell until snug. When four wedges are used, they are inserted side by side, in pairs. Wedges can be used with push-on joints only.

(b) Copper Cable Bond Conductor

Installation of copper cable bond conductor across the joints of push-on and mechanical joint pipe and fittings. The copper cable shall be a minimum AGW size #4 copper cable, The copper cable shall be welded to the

DIVISION 13
WATERMAIN

pipe on push-on joints and have cable ends that fit standard watermain bolts for mechanical joints. The copper cable shall be of sufficient flexibility to withstand ground and pipe movement after installation.

(c) Copper Strap Bond Conductor

Installation of copper strap bond conductor across the joints of push-on joint pipe. The copper jumper strips shall be 1/16" x 3.4", 48 ounce soft copper, bolts shall be 5/16" x 3/4" silicon bronze hex head bolt and nut. The copper strap shall be welded to the pipe and be of sufficient flexibility to withstand ground and pipe movement after installation.

(d) Conductive Push-On Gaskets

These gaskets may be used in lieu of wedges, cable or strap bond conductors. Metal contact strips which are molded or inserted into the gasket must insure positive electrical contact between pipes. A thorough cleaning of gasket seating surface should be preformed prior to assembly.

(e) Payment

The payment for provisions for electrical thawing shall be included in the cost of the new watermain. No other payment shall be made.

13.02.04 Fire Hydrant

A 5 1/4" M.V.O. East Jordan (5BR 250) hydrant shall be furnished and installed in the locations shown on the drawings and should be placed in a plumbed vertical position. Hydrants shall be of the non-compression type, and shall conform to ANSI / AWWA C502-14 as last adopted, and any Underwriter Laboratories requirements. Hydrants shall have two 2-1/2" hose connections and one 5" "STORZ" fitting; their barrels shall be 8-1/2 inches in diameter (minimum) with 5-14" valve openings and shall open to the left utilizing a 1" nut (measured flat to flat). All hydrants shall be painted red. Threaded connections shall conform to the City of Muskegon Standard Big Six (six threads per inch). Hydrant inlets shall have 6" diameter mechanical joint connections unless otherwise specified on the plans or in the special provisions. The hydrant assembly shall have all mechanical joints restrained with ductile iron MEGALUG glands. The hydrant shall be so designed so that the direction of the nozzles can be reoriented without digging up the assembly, and so that height extensions may be added at a later date. Hydrants shall have bronze interior parts including operating stems. Bronze to bronze

main valve seats shall be required if seat removal is necessary for removing the valve assembly. All hydrants shall have a minimum bury of 6-1/2 feet. If the operating screw is located on the top it shall be bronze. Hydrants shall come with dual drain outlets conforming to AWWA C502-14, Section 4.8.2. When hydrants are installed below the water table, or in soils that are not

DIVISION 13
WATERMAIN

permeable, the brass drain hole bushing shall be removed and a threaded brass plug inserted into the drain hole (weep hole) as directed by the engineer.

13.02.05 Gate Valves

All valves shall be iron body, bronze mounted, double disc. Parallel seat or compression resilient seated, with a 2" operating nut open to the right, with the direction indicated by an arrow cast on to the valve or the operating nut. Generally, end connectors shall be mechanical joint for all exterior ground-buried valves, unless otherwise specified. All valves shall have bronze stem, o-ring stem seal, non-rising stem, the stem shall have continuity with the body, and shall have a clean waterway equivalent in area, when open, equal to that of the connecting pipe. All valves shall be of new construction and complete with operating equipment and other appurtenances necessary for operation. All valves shall be designed to maintain a minimum 150 pound working pressure, tested at 300 pounds for sizes 14" through 48" or minimum 200 pound working pressure and tested at 400 pounds for sizes 2" through 12" and manufactured as per ANSI / AWWA C500 and C509. The valves shall be shipped as fully assembled as practicable. The exposed flanges and mounting pads shall be protected by wooden pieces bolted to them. All necessary skids and lifting devices shall be provided. Non-attached items shall be packed in boxes and properly labeled for assembly. The contractor may be required to furnish the services of a competent factory-trained serviceman to check final installation and supervise original start-up and operation of the equipment specified. Such services shall be included in the cost of the valve.

13.02.06 Butterfly Valves

Butterfly valves shall be manufactured to conform in all respects to the latest revisions of ANSI / AWWA, designation C-504, and coated inside and outside with standard bitumastic coating for water mains. The body, disc, shaft, seats, bearings and operators shall be designed based on Class 150B and may be the short or long body type. All butterfly valves shall have a working pressure of 150 psi, hydrostatically tested at 300 psi, and bubble-tight tested at 150 psi. The seat-ring shall be made of rubber body or disc mounted, and shall be adjustable and field replaceable in sizes 16" and larger. The shaft may be of the through type or stub type and shall be marked on the end to indicate the position of the valve disc with respect to the shaft and the shaft shall have continuity with the body. The shaft seals shall be of the "split-V" or "Chevron" type. The valve disc shall be of corrosion-resistant alloy cast iron. The valve disc shall be offset so as to prevent valve flutter in the full open position. The valves shall be equipped with a stainless steel stop in the operator to prevent the disk from rotating through the closed position. The valve operator shall be permanently lubricated and sealed for buried service and shall be equipped with a two-inch square operating nut. The operator shall be constructed such that the valve will open when the nut is turned to the right or in a clockwise direction, with the direction indicated by an arrow cast onto the operating nut. Operators for valves 16" and 20" in size may be of the

DIVISION 13
WATERMAIN

traveling-nut or worn gear type. Operators for 24" and larger shall be of the worn gear type. Generally, end connectors shall be mechanical joint, unless otherwise specified. All valves shall be of new construction and be complete with all operating equipment and other appurtenances necessary for operation. The contractor may be required to furnish the services of a competent factory-trained serviceman to check final installation and supervise original start-up and operation of the equipment specified. Such services shall be included in the cost of the valve.

13.02.07 Tapping Sleeve and Valve

Tapping Sleeves shall be full stainless steel sleeve as manufactured by Romac Style SST or approved equal, meeting the requirements of ANSI B16.1 Class 125 and in accordance with MSS-SP60, the sleeve will be required when tapping into existing watermain. The valve shall conform to City of Muskegon Standard Specifications 13.02.05. The joint between the sleeve and valve will be flanged. The Contractor shall present for approval detailed shop drawings of the assembly. Payment shall be at the unit price as described in the proposal and shall represent payment in full for the sleeve, valve and box completely installed.

13.02.08 Valve Boxes

Valve boxes shall be of ductile cast iron, adjustable, and furnished complete including cover, top section, center section and base. Valve boxes shall be not less than five inches in diameter with a minimum adjustment of 24 inches above and below proposed grade. The covers shall have the appropriate name cast on it ("WATER"). All parts of valve boxes, base and covers shall be coated by dipping in hot bituminous varnish. The valve box shall be placed centered on the valve nut and be placed in a plum vertical position. Payment for the materials and labor to install this item shall be included in the cost of the valve, unless otherwise specified.

13.02.09 Adjusting Water Valve Boxes

The water box materials shall be placed centered on the valve nut and be placed in a plumb vertical position. Pavement placement shall be the same as for adjusting manholes, (Section 14.04) unless otherwise specified. No payment will be allowed for adjusting water valve boxes either existing or new unless stipulated in the proposal.

13.02.10 Fitting Restraints

All plugs, caps, tees and bends which deflect 1 1/4 degrees or more, shall be provided with suitable restraints to prevent movement, in a manner acceptable to the Engineer. The restraint shall be applied to joints in each

DIVISION 13
WATERMAIN

direction from the fitting according to the pipe restraint schedule or as shown on the construction plans in order to resist the thrust of the test pressure. Details of all restraints, unless specified, are to be submitted to the Engineer for approval. All joint restraints shall be considered incidental to this section of work, and included in the cost of the fitting. When specified as being necessary MEGALUG retainer glands shall be used for all ductile iron mechanical joint pipe and fittings through 24" and fast-grip gaskets for push-on pipe. For sizes larger than those maximums, self-restraining joints such as Superlock, or Lockfast pipe shall be used, or as specified by the Engineer.

13.02.11 Retainer Glands

Retainer Glands shall conform to 2.04.05 specification for watermain joints. Payment for this item shall be included with the new pipe and fittings. No additional payment will be allowed.

13.02.12 Flanged Joints

Where specified. Flanged joints shall be drilled using the Standard 125 pound Template.

13.02.13 Plugs and Caps

The caps (Tyler 5-155, or approved equal) plugs (Tyler 5-152, or approved equal) shall be ductile cast iron, and be 2" tapered with plug. Payment for caps and plugs in place shall be bid price as found in the proposal, or otherwise specified. No payment will be made for temporary caps and plugs used for testing purposes.

13.03 CONSTRUCTION METHODS

13.03.01 General Excavation

On any contract where the Engineer will supply grades, the Contractor will notify the Engineer at least 48 hours in advance. The trench shall be excavated true to line and grade and shall be of sufficient width to provide adequate working space for making joints, compacting back fill, sheeting, pumping and of sufficient depth so that the top of pipe will have a minimum cover of 5-1/2 feet as measured from the established or proposed gutter grade, or as measured from the proposed or existing ground elevation (six feet from the top of curb).

The Contractor shall take adequate precautions to protect all grade stakes. The Contractor shall be responsible for the cost of replacement of stakes which are damaged or lost through his negligence.

There shall be a minimum of six inches of clearance on each side of the barrel of the pipe and a maximum width of the trench at the level of the

DIVISION 13
WATERMAIN

top of the pipe of not more than a distance equal to the O.D. of the pipe plus 24 inches. On paved streets, the pavement shall be cut by means of concrete

saws to a neat and straight line along the top edge of the intended trench opening, and all sawing shall be included in the cost of trench repair.

All material in excess of that needed or which is unusable shall be disposed of at such locations as the Engineer may direct. If the disposal site has been specified in the special provisions, the cost of disposal shall be included in the lineal foot cost of the pipe. If no disposal site has been specified, all excess material becomes the property of the Contractor.

The Contractor shall call Miss Dig 3 working days (Excluding Sat. Sun. and Holidays) before digging (1-800-482-7171) for the location of existing under ground systems. The Contractor is liable for all damages to existing under ground systems.

13.03.02 Sheeting and Bracing

When the depth of the trench or soil conditions require, or to prevent damage to adjacent structures and property, or to protect workmen, the sides of the trench shall be sheeted, shored and braced adequately to prevent sliding or caving. All underground utilities crossing the trench or running parallel to the proposed pipe, shall be supported and braced in an approved manner. All materials and labor for sheeting, shoring and/or bracing shall be furnished by the Contractor and will be considered incidental to the work. The Contractor is fully responsible for the sufficiency of such supports and for the integrity of his work. In the removing of the sheeting or bracing, special care shall be taken to prevent any caving of the sides of the excavation and to prevent damage to the completed work or to adjacent property, and to prevent loss of density in the pipe bedding material.

13.03.03 Obstructions

Wherever obstructions, not shown on the plans, are encountered and interfere to such an extent that an alteration to the plan is required, the Engineer shall be notified at once and shall make such changes in the plans as he deems necessary. If such a change results in a significant increase in the amount of work required of the Contractor, such a change shall be paid by

change order to the contract, only to the extent that his change in work is not covered by contract unit prices.

13.03.04 Deflections

DIVISION 13
WATERMAIN

Deflections for obstructions or other purposes shall be governed by these allowable limits in the table presented below, unless further deflection is allowed by written communication from the Engineer.

DEFLECTION TABLE

Unrestrained Connections only

<u>Pipe Size</u>	<u>Deflection in inches</u> <u>Per 20 foot length</u>
3	27"
4	27"
6	22"
8	17"
10	17"
12	17"
14	11"
16	11"
18	9"
20	9"
24	7"

13.03.05 Laying Condition

Laying Conditions Unless Specified Otherwise, Shall conform to the most Current Michigan Department of Transportation Standard Specifications for Construction, Standard Plan for Utility Trenches, R-83-C, or subsequent revision thereof for the trench detail specified.

13.03.06 Unsuitable Conditions

Where unstable soil is encountered at pipe grade, Trench undercut and backfill will be done and Unless Specified Otherwise, Shall conform to the most Current Michigan Department of Transportation Standard Specifications or subsequent revision thereof.

13.03.07 Pipe Care

Care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials. Bulkheads shall be used at open ends of the pipe to insure cleanliness, especially at the end of each day's work. If there is water in the trench, a water-tight plug will be utilized, and the seal must remain in place until the trench is pumped completely dry. The end shall also

be plugged whenever the pipe is left unattended. The pipe shall be laid with the bell ends facing in the direction of laying, unless otherwise directed by the Engineer.

DIVISION 13
WATERMAIN

13.03.08 Dewatering

When dewatering is encountered, Unless Specified Otherwise, Shall conform to the most Current Michigan Department of Transportation Standard Specifications or subsequent revision thereof.

13.03.09 Push-On Joint Assembly

It is essential that the gasket groove be clean and free of foreign matter prior to lubrication and gasket installation. Wire brushing, wiping or flushing may be required. The cleaned gasket groove shall be lubricated to make gasket installation easier and to assist in proper positioning of the gasket. The gasket must be correctly positioned within the groove. Check with fingers to be sure of correct placement. Lubricate the gasket over its entire inner surface; as well as to the bevel of the plain end. The joint should be assembled with both pipes reasonably straight alignment. Any deflection should be made after the joint is assembled. On any field cut pipe, the outside edge must be beveled and smoothed as any sharp corner may cause gasket damage. Straight alignment is especially important when assembling field cut pipe. Field inspection by the Engineer must be accomplished before a field cut pipe may be joined. During cold weather installations, keep gaskets warm prior to placement within the bell, to reduce their stiffness.

13.03.10 Mechanical Joint Assembly

The inside of the bell and the plain end of the pipe must be thoroughly cleaned of foreign matter and wire brushed if necessary. All surfaces and gaskets should be brushed over with soapy water. A rubbed gasket and follower gland should be placed on the plain end "seated" in the mechanical flanged bell; and then the gasket firmly and evenly pressed into the bell. After the gland is in position for bolting, insert all bolts and make all nuts finger-tight. Keeping the plain end centrally located within the bell, begin tightening bolts, bringing all bolts up evenly at all points around the bell flange. Alternate bolts from side to side until all bolts are uniformly tight within the correct range of torque of 75 to 90 foot pounds (4" thru 24" sizes). If effective sealing is not attained at the maximum torque level, the joint should be disassembled and reassembled after thorough cleaning. Megalug style retainer glands shall be used on all mechanical joints, after all gland bolts are tight, bring all retainer bolts hp evenly around the pipe, tighten all retainer bolts by alternating tightening on opposite sides of the pipe until the twist-off nuts snap off.

13.03.11 Existing Water Main Connections

DIVISION 13
WATERMAIN

Existing water main connections may be oversized. The Contractor shall confirm the size of the existing water main prior to the connections. No additional payment shall be made if over sized fittings are required.

13.03.12 Cut and Cap ___ Inch Watermain

The existing ___ inch watermain as shown on the construction plans, shall be cut and capped with a ductile iron, mechanical joint cap and restrained with retaining glands. The existing watermain will be thrust blocked in a manner to prevent movement of the existing watermain. Engineer will determine if the contractor's method of thrust blocking is acceptable

The completed work, Cut and Cap, ___ inch Watermain as shown on the construction plans and in the proposal, shall including all materials, labor and equipment, as measured and will be paid for at the contract unit price for Cut and Cap, ___ inch Watermain. No other payment will be allowed.

13.03.13 Compaction Tests

All soil compaction tests shall be preformed by the City with full cooperation and labor and equipment assistance from the contractor. The Contractor shall be allowed one re-test. All costs for any additional testing due to failure of the Contractor to meet density requirements shall be borne by the Contractor. These costs shall include all labor and equipment and supervision needed to re-test failed areas.

13.03.14 Field Cutting Pipe

The spigot ends of pipe which have been field cut, shall be ground to a smooth surface and painted with two coats of asphaltum metal protective paint.

13.04 WATER SERVICES

13.04.01 Definition

As used herein, water services shall be considered to include all pipe, corporation cocks, curb stops, curb boxes and all necessary appurtenances to transport water from the watermain to private property. For larger services requiring valves instead of corporation cocks, specifications will be covered in the Special Provisions.

13.04.02 Scope

DIVISION 13
WATERMAIN

The Contractor shall, unless otherwise noted, furnish all materials, equipment, tools and labor necessary to accomplish the installation of all water services at the locations shown on the plans or as located by the Engineer. The Contractor shall conduct his work as to minimize traffic interruptions.

13.04.03 Corporation Cocks

The unit price of this item shall include all labor and materials for tapping the existing watermain and installing the corporation cocks, utilizing a Mueller # P25008, Ford # FB1000-X pack joint or approved equal. On services 1 ¼" to 2" a ductile cast iron saddle Ford # FS101 or approved equal shall be used and will be included with the corporation cock payment. Payment will be for installation complete.

13.04.04 Water Service Line

The unit price of this item shall include all labor and materials for laying copper service pipe, type K, at the location specified and of the size indicated on the plans; in the proposal, or as specified by the Engineer. The service shall be connected to the corporation cock and "goose-necked" for expansion purposes, with a minimum of 5 ½ feet of bury below the proposed grade. Payment for water service shall be by the lineal foot as measured horizontally from the centerline of the main to the centerline of the curb stop or meter pit and from the centerline of the curb stop to the connection point of the existing water service, from the connection point of the meter pit to the connection point of the existing water service shall be lineal foot of pipe used, the connection fitting shall be included in the new water service line and shall have continuity between the old and new service.

13.04.05 Curb Stop and Box

The unit price of this item shall include all labor and materials to install a working and useable curb stop and box., utilizing a Mueller # P25155, Ford # B44-444M pack joint or approved equal with 2 inch Minneapolis thread, bushed for 1 ½ inches. Connections shall be copper pipe to copper pipe. Payment will be for installation complete.

13.04.06 Meter Pit

DIVISION 13
WATERMAIN

The unit price of this item shall include all labor and materials to install a working and useable meter pit, utilizing a Ford # W3-T Cover with Locking lid, Ford # AV94-324W pack joint Angle Yoke Key Valve, Ford # L94-24D pack joint Yoke Ell, Ford # EC-23 Expansion Connection, Ford # Y503 Series Yoke Bar, Sono-Loc 20 inch diameter 36 inch high Meter Box, or approved equal on all items, the City of Muskegon will provide the meter. The Contractor will install to finish grade at locations specified on the plans; in the proposal, or as specified by the Engineer. Payment will be for installation complete.

13.05 HYDROSTATIC TESTS

Connecting to Existing Water Mains Prior to Pressure Testing Will Not Be Allowed. Preliminary testing of mains shall be done by the Contractor to ascertain if there are any major leaks. Final pressure tests shall be made in presence of the Engineer, who shall receive 24 hours notice prior to testing. The Contractor shall pressure test each 5000 foot section of water main as it is constructed or as directed by the Engineer. Pressure testing of each 5000 foot section shall be made in increments of 1500 feet or less.

Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants for blow off are not available at high points, the Contractor shall make the necessary taps to release the air and insert plugs after the test has been completed, or install corporation cocks and leave them in place after testing. The Engineer shall notify the Municipal Water Department prior to making connections to any existing watermains, filling of mains with water and flushing of any watermains. Reasonable use of water from City mains for purposes of testing will be available at no cost to the Contractor.

The Contractor shall furnish proper appliances and facilities for testing and draining the main without injury to the work and surrounding territory. The Contractor shall test by filling the main with clean water under minimum hydrostatic pressure of 150 lbs per square inch. In no case shall the leakage in any stretch of pipe being tested exceed the following amounts in a 2-hour period: All pipe installed on the project shall be tested in accordance with the requirements of ANSI / AWWA C600-10.

$$L = \frac{SD \sqrt{P}}{148,000}$$

Where;

L = testing allowance (makeup water), in gallons per hour

S = Length of Pipe tested, in feet

DIVISION 13
WATERMAIN

D = Nominal Diameter of Pipe Tested, in Inches

P = Average Test Pressure during the hydrostatic test, in pounds per square inch (gauge)

For 6" pipe – 1.00 gallons per 1000 lineal feet per two hour period
For 8" pipe – 1.32 gallons per 1000 lineal feet per two hour period
For 10" pipe – 1.66 gallons per 1000 lineal feet per two hour period
For 12" pipe – 1.98 gallons per 1000 lineal feet per two hour period
For 14" pipe – 2.32 gallons per 1000 lineal feet per two hour period
For 16" pipe – 2.64 gallons per 1000 lineal feet per two hour period
For 18" pipe – 2.98 gallons per 1000 lineal feet per two hour period
For 20" pipe – 3.32 gallons per 1000 lineal feet per two hour period
For 24" pipe – 3.98 gallons per 1000 lineal feet per two hour period
For 30" pipe – 4.96 gallons per 1000 lineal feet per two hour period
For 36" pipe – 5.96 gallons per 1000 lineal feet per two hour period

In the event that a leak is detected and located, the Contractor shall review the method of repair with the engineer for concurrence before proceeding with the repair. After repairs are made the main will be retested. The Contractor shall notify the Engineer of his intent to retest at least 24 hours in advance. However, the Contractor shall not begin the retest until all attempts have been made to correct all defects, and approval for retesting has been given by the Engineer.

The City shall be responsible for all inspection costs for the first two hydrostatic tests of any section. If a section requires a third hydrostatic retest, the Contractor may be held liable for such inspection costs incurred by the City of Muskegon personnel.

13.06 ELECTRICAL CONDUCTIVITY

All ductile iron pipe and fittings furnished and installed under this contract shall be provided with electrical conductivity connections. Electrical conductivity connections shall be brass wedges, copper cable bond, copper strap bond, conductive push-on gaskets and megalug retainer glands as specified. After installation of the mains, backfilling and the hydrostatic pressure tests are completed, the system (pipe line and hydrants) shall be tested for electrical continuity and current capacity. It is imperative that all lines and appurtenances be filled with water prior to conductivity testing. The line will be tested in sections between hydrants and or stand pipes. The hydrants and hydrant valves will be opened to bleed off any air in the lead. The hydrant will then be closed and the hydrant valve left open. Adjacent hydrants or stand pipes will serve as test section termini. The Contractor will provide electric current of 100 to 150 amperes for the test. Direct current of 150 amperes, shall be passed through the pipe line for a period of five minutes. Current flow through the pipe shall be measured continuously on a suitable ammeter and shall remain steady without interruption or excessive fluctuation throughout the five minute test. Insufficient current or intermittent

DIVISION 13
WATERMAIN

current or arcing, indicated by large fluctuations of the ammeter needle, shall be evidence of defective electrical contact in the pipe line. The cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and shall meet the test requirements to the satisfaction of the Engineer. All electrical connections shall be capable of carrying 60 amps. Any pipe cut and repaired with couplings shall have electrical connections. In addition to the above work the Contractor at the time the joint is made shall test each joint for contact effectiveness. The payment for electrical conductivity shall be included in the cost of the new watermain. No other payment shall be made.

13.07 Tapping Existing Water Mains 4 Inch and Larger

All work relative to tapping existing watermains shall be under the supervision of the Water Department Superintendent. The Contractor, after proper notice and coordination, shall have at the site adequate personnel, equipment and materials to properly install the tapping sleeve and valve. The existing watermain shall be exposed and the pipe cleaned to accept the tapping sleeve. The sleeve shall then be installed and valve attached. The Contractor shall then perform the pressure test at (150#) for five (5) minutes in the presence of the project Inspector. After testing, personnel from the Water Department will make the tap using City equipment. The Contractor will assist as necessary. No charges shall be made to the Contractor by the City for such described work.

13.08 Permeation

Every effort will be made to identify any contaminated areas before any work proceeds, but should the contractor encounter any contaminated area, work shall cease and the specialized gaskets for use in contaminated areas will be used. Refer to AWWA C600 section 4.1 (**Permeation**), for instructions about how to proceed in contaminated work areas.

13.09 CLEANING AND DISINFECTING

13.09.01 Flushing

After the hydrostatic tests have been satisfactorily completed, the pipe lines shall be cleaned and flushed by introducing water from the city water-mains into the completed line and the water allowed to flow from the far end of the section and flushed until it runs clear. Before the main is chlorinated, it shall be flushed with potable water to remove air pockets and particulates. The flushing velocity in the main shall not be less than 3.0 ft/sec in accordance with AWWA C651-14, Section 4.4.2. Each section tested shall be

DIVISION 13
WATERMAIN

flushed separately. All disinfecting shall be done in accordance with AWWA Standard C651-14.

13.09.02 Disinfecting

Disinfect the pipe lines with chlorine. The preferable point of application of the chlorinating agent is at the beginning of the new pipe line, or any valve section of it, and through the stand pipe or a corporation cock inserted in the horizontal axis of the newly laid pipe. Water from existing watermains should be controlled to flow very slowly into the newly laid pipe during application of chlorine. Partially open the end-most hydrant or valve on the section of pipe line under treatment to permit the flow of water through the pipe line. Continue treatment until the water flowing from the far end of the main contains a chlorine residual of at least 25 parts per million. Stop the flow of water and chlorine by closing appropriate openings. (See Sections 13.09.05 and 13.09.06 for information on chlorine products and methods of application) A field test shall be done for determining that the proper amount of chlorine residual is in the new pipe line, the test shall be done by the Contractor with testing equipment approved by the Engineer.

13.09.03 Disinfecting Duration

Permit the treated water to remain in the pipe line for at least 24 hours, after which, there should be a free chlorine residual of not less than 10 ppm. A field test shall be done for determining that the proper amount of chlorine residual is in the new pipe line, the test shall be done by the contractor with testing equipment approved by the Engineer. The main shall then be thoroughly flushed until all of the heavily chlorinated water is removed to the point of a residual chlorine content not to exceed 2 ppm, or a residual acceptable to the City of Muskegon Department of Public Works. The Contractor will test the water to see that this has been accomplished. (See AWWA C651-14, Section 4.9)

13.09.04 Sampling

The Engineer will schedule with the water filtration plant for sample pick-ups. (First sample pick-ups shall be done Monday through Thursday, no first sampling will be done Friday through Sunday) An initial set of samples will be taken after 16 hours without any water use. Then collect, using the sampling site procedures outlined and without flushing the main, two sets of samples a minimum of 15 min apart while the sampling taps are left running. Both sets of samples must pass for the main to be approved for release. A 48 hour test is required for each sample. If the results of the samples are unsafe, a repeat of the chlorine treatment and sampling is necessary. A set of samples includes all samples collected along the length of the pipeline. For new mains, sets of samples shall be collected every 1200 feet of the new watermain, plus one set from the end of the line, and at least one from each branch greater than one pipe length. Sampling should never be collected from

DIVISION 13
WATERMAIN

hoses or fire hydrants. Sampling shall be from stand pipes or a corporation tap with a copper pipe extension. Sampling points shall have a valve and a copper gooseneck assembly. Cost of collecting samples and laboratory analysis shall be paid for by the City of Muskegon, up to a maximum of two tests per section. Any additional testing will be at the Contractors expense. All materials, labor, equipment and tools for conducting the cleaning and disinfecting treatment shall be furnished by the Contractor without cost to the City. All sampling shall be done in accordance with AWWA C651-14, section 5.1, Bacteriological Tests.

13.09.05 Chlorine Products

Chlorine products for disinfecting watermain are available in several forms. Refer to AWWA C651-14, Sec. 4.1 for the forms of chlorine which may be used in the watermain disinfection operation, and the proper methods of handling and feeding different types of chlorine into the watermain. The most convenient forms are as follows:

A. Liquid Chlorine (gas) conforming to ANSI/AWWA B301 contains 100 percent available chlorine and is packaged in steel containers usually of 100-lb, 150-lb, or 1-ton net chlorine weight. The pressure of the chlorine in the cylinder varies with the outside temperature and will usually be found to vary between 40 and 140 lbs. per square inch.

B. Calcium hypochlorite conforming to ANSI/AWWA B300 is available in granular form or in 5-g tablets and must contain approximately 65 percent chlorine by weight. The material should be stored in a cool, dry, and dark place to minimize its deterioration.

CAUTION: Tablets dissolve in approximately 7 hr and must be given adequate contact time. Do not use calcium hypochlorite intended for swimming pool disinfection, as this material has been sequestered and is extremely difficult to eliminate from the pipe after the desired contact time has been achieved.

13.09.06 Calcium hypochlorite Application

A solution of water and approved chlorine should be applied to watermain by means of solution feed chlorinating device with a power operated booster pump. High test calcium hypochlorite must be prepared as a water mixture for introduction into the watermain. The powder should be made into a paste and then thinned to about a 1% chlorine solution (10,000 parts per million). The preparation of a 1% chlorine solution requires the following proportions of powder to water.

DIVISION 13
WATERMAIN

<u>Product</u>	<u>Amount of Compound</u>	<u>Gals. Of Water</u>
High test calcium Hypochlorite 65% to 70%	1 lb	8.0

Prepare the 1% chlorine solution in a container and permit solids to settle. Apply the clear supernatant solution to the main by pumping through a power operated chemical feeder. The following table indicates the amount of chlorine required for each one hundred feet of various pipes.

<u>Size of Pipe</u>	<u>Vol. gals. In 100 ft. pipe</u>	<u>Amounts of chlorine or chlorine solution per 100 ft of main for 25 p.p.m.</u>	
		Chlorine 100%	1% Chlorine Water Solution
4"	65.3	.013 lbs.	.16 gal.
6"	146.9	.030 lbs.	.36 gal.
8"	261.1	.054 lbs.	.65 gal.
10"	408.0	.085 lbs.	1.02gal.
12"	587.5	.120 lbs.	1.44 gal.
16"	1044.5	.217 lbs.	2.60 gal.

13.10 METHOD OF MEASUREMEMENT AND PAYMENT

13.10.01 Watermain Pipe

Watermain Pipe shall be measured by lineal feet of pipe in place, including the lengths of fittings and valves, as measured along the center line of the pipe. At hydrant leads, watermain pipe shall be measured by lineal foot from the centerline of the main to the centerline of the hydrant including fittings and valves.

DIVISION 13
WATERMAIN

13.10.02 Valves and Fittings

Valves and Fittings shall be paid for as “each”, and the unit price shall include the cost of all materials and accessories, testing installation, restraining devices and labor necessary for proper operation.

13.10.03 Restraining Devices

Restraining devices, thrust blocks, retainer glands, tie rods, etc., shall be incidental to the piping costs and the cost of which shall be included in the unit price for watermains and / or valves, fittings, etc.

13.10.04 Hydrants

Hydrants shall be paid for as “each”, and shall include all materials, accessories and labor to install this item in the proper manner. Hydrant valves shall be paid for separately as an “each” item but the cost of all the restraining devices is incidental and should be included in the cost of the pipe in place.

**CITY OF MUSKEGON
SPECIAL SPECIFICATION
FOR
WATERMAIN & FITTINGS**

1 of 10

HRC/LNM

City of Muskegon

DESCRIPTION:

This special provision defines and describes the methods and materials required to place new watermain and fittings.

MATERIALS:

MATERIALS TO BE PROVIDED BY CITY: Watermain pipe, fittings and hydrants shall be purchased by the City of Muskegon and provided to the contractor for installation in the project. Once the material has been picked up, the contractor is fully responsible for the material. All materials can be picked up from the City of Muskegon Department of Public Works located at 1350 East Keating Avenue, Muskegon, MI 49442.

The City will provide a copy of the invoices for the material. As the material is being picked up from the yard, the contractor shall use the invoice as a checklist, providing dates and signatures for each item picked up to allow for proper chain of custody.

WATERMAIN: Watermain pipe shall be cement lined ductile iron class 52 with push on joints. Pipe shall be restrained according to the attached PIPE RESTRAINT SCHEDULE with mechanical joints or push-on joints using field lock gaskets. All pipe joints shall be provided with electrical conductivity connections. All watermain shall be NSF 61 approved.

RETAINER GLANDS: Retainer gland Megalug series 1100 or approved equal shall be used for all mechanical joint pipe and fittings. The joint restraint ring and its wedging components shall be made of grade 60-42-10 ductile iron conforming to ASTM A536-84. The wedges shall be ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of the latest revision. Torque limiting twist-off nuts shall be used to insure proper actuation of the restraining wedges. The Retainer Gland shall utilize standard tee head bolts and gasket conforming to ANSI A21.11. The Contractor shall submit to the Engineer a shop drawing or sample for Engineer approval

FITTINGS: Sleeves, Tees, Bends and reducer shall be ductile iron cement lined with mechanical joints conforming to, AWWA C110 and AWWA C111. All mechanical joints shall be restrained with retaining glands.

ELECTRICAL CONDUCTIVITY CONNECTIONS: One of the methods described below must be used to ensure electrical conductivity.

- (a) Serrated Silicon Bronze Wedges

Two per joint for 3" through 12" pipe, four for larger pipe. Each wedge is to be driven into the opening between the plain end and the bell until snug. When four wedges are used, they are inserted side by side, in pairs. Wedges can be used with push-on joints only.

(b) Cable or Strap Bond Conductor

Installation of a cable or strap bond conductor across the joints of push-on and mechanical joint pipe and fittings. The copper cable or strap shall be capable of carrying 150 amps and be of sufficient flexibility to withstand ground and pipe movement after installation.

(c) Conductive Push-On Gaskets

These gaskets may be used in lieu of the wedges. Metal contact strips which are molded or inserted into the gasket must insure positive electrical contact between pipes.

A thorough cleaning of the gasket seating surface should be performed prior to assembly

WATERMAIN SPECIFICATION REFERENCE:

Ductile Iron, Push-On Joint, 3" – 24", AWWA C151

Push-On Joint Detail, AWWA C111

Ductile Iron, Mechanical Joint, 3" – 24", AWWA C151

Mechanical Joint Detail, AWWA C111

Cement Lining, AWWA C104. (Standard Thickness)

Ductile Iron Pipe Wall Thickness Determination, AWWA C150

Ductile Iron Flanged Joint Pipe, 3" – 24", AWWA C151 and AWWA C110

Cast Iron and Ductile Iron Fittings, AWWA C110

Mechanical Joint Fittings, AWWA C110 and AWWA C111

Push-On Joint Fittings, AWWA C110 and AWWA C111

Flanged Fittings, AWWA C110

Flanges, ASA-B16.1 Standard Class 125

Copper Pipe, ASTM Spec B88-55 "Type K"

Retainer Glands, Megalug Series 1100

Fire Hydrants, AWWA C502

CONSTRUCTION METHODS:

WATERMAIN PUSH ON JOINT ASSEMBLY: It is essential that the gasket groove be clean and free of foreign matter prior to lubrication and gasket installation. Wire brushing, wiping or flushing may be required.

The cleaned gasket groove shall be lubricated to make gasket installation easier and to assist in the proper positioning of the gasket. The gasket must be correctly positioned within the groove. Check with fingers to be sure of correct placement. Lubricate the gasket over its entire inner surface; as well as to the level of the plain end. The joint should be assembled with both pipes in reasonably straight alignment. Any deflection should be made after the joint is assembled.

On any field cut pipe, the outside edge must be beveled and smoothed as any sharp

corner may cause gasket damage. Straight alignment is especially important when assembling field cut pipe. Field inspection by the Engineer must be accomplished before a field cut pipe may be joined.

During cold weather installations, keep gaskets warm prior to placement within the bell, to reduce their stiffness.

Payment for Watermain Push on Joint Assembly shall be included with the payment for each particular size of watermain and fittings installed.

WATERMAIN MECHANICAL JOINT ASSEMBLY: The inside of the bell and the plain end of the pipe must be thoroughly cleaned of all foreign matter and wire brushed if necessary. All surfaces and gaskets should be brushed over with soapy water. A rubber gasket and follower gland should be placed on the plain end "seated" in the mechanical flanged bell; and then the gasket firmly and evenly pressed into the bell. After the gland is in position for bolting, insert all bolts and make all nuts finger-tight. Keeping the plain end centrally located within the bell, begin tightening bolts, bringing all bolts up evenly at all points around the bell flange. Alternate bolts from side to side until all bolts are uniformly tight within the correct range of torque of 75 to 90 foot pounds (4" thru 24" sizes). If effective sealing is not attained at the maximum torque level, the joint should be disassembled and reassembled after thorough cleaning.

Payment for Watermain Mechanical Joint Assembly shall be included with the payment for each particular size of watermain and fittings installed.

WATERMAIN PIPE DEFLECTION: Deflections for obstructions or other purposes shall be governed by these allowable limits in the following table, unless further deflection is allowed by written communication from the Engineer.

DEFLECTION TABLE

Pipe Size	Deflection in inches per 18 foot length	
3	24"	Note: Unrestrained Connections only.
4	24"	
6	20"	
8	15"	
10	15"	
12	15"	
14	10"	
16	10"	
18	8"	
20	8"	
24	6"	

WATERMAIN PIPE CARE: Care shall be taken to keep the interior of the pipe clean and free from dirt and other foreign materials. Bulkheads shall be used at the open ends of the pipe to insure cleanliness, especially at the end of each day's work.

If there is water in the trench, a water-tight plug will be utilized, and the seal must remain in place until the trench is pumped completely dry. The end shall also be plugged whenever the pipe is left unattended. Pipe shall be laid with the bell ends facing in the direction of lying, unless otherwise directed by the Engineer.

Payment for watermain pipe care shall be included with the payment for each particular size of watermain and fittings installed.

HYDROSTATIC TEST: Watermains must be tested for leakage before the work is accepted. The lines shall be tested section by section by use of valves in the line or temporary plugs, but if conditions require, the Engineer may order any series of sections to be tested at one time.

The Contractor shall furnish the pump, gauge and other necessary materials and equipment and labor to properly make the test, which shall be made in the Engineer's or Inspector's presence, and the methods used shall be herein specified. The test shall be made at the high point in the line, which shall be determined by the Engineer.

The section or sections of the line to be tested shall be filled with potable water and the entrained air within the pipe expelled. The line shall be pumped up to a pressure of one hundred and fifty (150) pounds per square inch, and if the gauge holds, the test period shall be considered as started. The lines shall be continuously kept pumped to the specified one hundred and fifty (150) pounds per square inch pressure, for a two hour period, by pumping additional water into the line, and the amount of water so added shall be measured and considered to represent the leakage from the line under test during the testing period.

The leakage under the conditions of the test shall not exceed the values as shown in the following formula:

$$L = \frac{SDP}{148,000}$$

Where:

L= Testing allowance (makeup water), in gallons per hour

S= Length of pipe tested, in feet

D= Nominal diameter of pipe, in inches

P= Average test pressure during the hydrostatic test, in pounds per square inch (gauge)

If the leakage exceeds the specified amount, the line shall be inspected for leaks.

After the line is repaired, the test shall be repeated. Final acceptance of the work shall not be made until the results of the test are satisfactory.

The Contractor shall notify the Engineer of his intent to retest at least 24 hours in advance. However, the Contractor shall not begin the retest until all attempts have been made to correct all defects, and approval for retesting has been given by the Engineer.

The City shall be responsible for all inspection costs for the first two hydrostatic tests of any section. If a section requires a third hydrostatic retest, the Contractor may be held liable for such inspection costs incurred by the City of Muskegon personnel.

The payment for hydrostatic testing shall be included in the payment for Watermain, DI, ___ inch, Tr Det G, Modified. No separate payment will be made for testing.

CLEANING AND DISINFECTING WATERMAIN: All valves shall be operated by Water Department personnel only. After the hydrostatic tests have been satisfactorily completed the pipe lines shall be cleaned and flushed by introducing water from the city water mains into the completed line and the water allowed to flow from the far end of the section flushed until it runs clear. Before the main is chlorinated, it shall be flushed with potable water to remove air pockets and particulates. The flushing velocity in the main shall not be less than 3.0 ft./sec in accordance with AWWA C651 section 4.4.2. Each section tested shall be flushed separately.

After cleaning and flushing, the pipe line shall be disinfected by introducing liquid chlorine or calcium hypochlorite solution into the mains with methods and equipment approved by the Engineer. The solution shall remain in the lines for a period of at least 24 hours. The liquid chlorine, or calcium hypochlorite solution containing not less than 10,000 PPM (one percent) of available chlorine, shall be introduced into the main through a corporation cock inserted in the horizontal axis of the pipe. The point of application shall be at the end of the section of the main where water from the existing water distribution system is available. A hydrant, valve or corporation cock at the far end of section treated shall be opened and water allowed to flow through the mains by opening a valve at the water supply end or by other means approved by the Engineer.

The chlorine or calcium hypochlorite solution shall be introduced into the main continuously while water is flowing, and the water pressure shall not exceed 20 pounds per square inch during the application of disinfectant.

The water shall be allowed to flow and the application of disinfectant continued until water flowing from the far end of section being treated shows a residual chlorine content of at least 50 parts per million when testing with an appropriate indicator. Each hydrant, valve and other lateral connection shall be flushed separately and following this operation all valves and hydrants shall be discontinued when the flow of water is stopped. The water so treated shall remain in the section under treatment for at least 24 hours with a chlorine residual of at least 10 PPM after that time. After the expiration of this period, the mains shall be flushed with water from the existing supply and water allowed to flow until the residual chlorine content does not exceed 2 parts per million or a residual acceptable to

the City of Muskegon Department of Public Works, when tested with an appropriate indicator. An initial set of samples will be taken at this time and resampled after a minimum of 16 hours. Sets of samples shall be collected every 1200 Ft of the new watermain, plus one set from the end of the line and at least one set from each branch greater than one pipe length. Samples of water will be used to preform bacteriological analysis to determine the purity of the water.

The Contractor shall notify the Engineer at least 48 hours in advance of his intent to begin disinfection. Upon completion of the analysis of the water samples, the Engineer will notify the Contractor whether or not the results are satisfactory. If the results are not satisfactory, the Contractor shall repeat the cleaning and disinfection process until the results of the analysis are satisfactory.

When relieving the watermain of water, the Contractor shall provide, install and maintain adequate equipment and materials to create dry working conditions at the construction site. Drainage discharge location shall be approved by the Engineer. The Contractor shall ascertain the availability and adequacy of the discharge point. Damage to receiving sewers or other property, Public or Private, will be the responsibility of the Contractor.

Calcium hypochlorite for disinfecting watermains shall be of the high test type, in powder form and shall have from 65 percent to 70 percent available chlorine. High test hypochlorite must first be made in a paste and then thinned with potable water to a 10,000 PPM solution.

The preparation of a one percent solution (10,000 PPM) requires 1 pound of 65 to 70 percent available chlorine hypochlorite to 10 gallons of potable water. Solution must be mixed in a wooden barrel or plastic.

Cost of collecting samples and laboratory analysis shall be paid for by the City of Muskegon, up to a maximum of two tests per section. Any additional testing will be at the Contractors expense.

The payment for cleaning and disinfecting watermain shall be included in the payment of the Watermain, DI, ___ inch, Tr Det G, Modified. No separate payment will be made for cleaning and disinfecting watermain.

WATERMAIN ELECTRICAL CONDUCTIVITY: All ductile iron watermain and fittings furnished and installed under this contract shall be provided with electrical conductivity connections. Electrical conductivity connections shall be of one of the three methods described in the materials section of this special provision. After installation of the mains, backfilling and the hydrostatic pressure tests are completed, the system (pipe line and hydrants) shall be tested for electrical continuity and current capacity. It is imperative that all lines and appurtenances be filled with water prior to conductivity testing. The line will be tested in sections between hydrants. The hydrants and hydrant valves will be opened to bleed off any air in the lead. The hydrant will then be closed and the hydrant valve left open. Adjacent hydrants will serve as test section termini. The Contractor will provide electric current of 150 amperes for the tests. Direct current of 150 amperes, shall be

passed through the pipe line for a period of five minutes. Current flow through the pipe shall be measured continuously on a suitable ammeter and shall remain steady without interruption or excessive fluctuation throughout the five minute test. Insufficient current or intermittent current or arcing, indicated by large fluctuations of the ammeter needle, shall be evidence of defective electrical contact in the pipe line. The cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and shall meet the test requirements to the satisfaction of the Engineer.

All electrical connections shall be capable of carrying 60 amps. Any pipe cut and repaired with couplings shall have electrical connections.

In addition, at the time the joint is made the Contractor shall test the joint for contact effectiveness. The actual conductivity test shall be run concurrently with the Hydrostatic Test.

The payment for testing the electrical conductivity of the new watermain shall be included in the payment of the Watermain, DI, ___ inch, Tr Det G, Modified. No separate payment will be made for electrical conductivity testing.

WATERMAIN CONNECTIONS: After new watermain has passed test for leakage, conductivity and disinfection the following procedure will be followed to connect the new main to the existing mains

Just prior to assembly, all pipe and fittings shall be disinfected by swabbing with a 1% Calcium hypochlorite solution. Watermain shall be buried 6 feet below top of curb. Conductivity connections shall be made at each joint. Pipe deflection shall not exceed 15 inches for 8" pipe, and 20" for 6" pipe. All pipe and fittings shall be bedded to the springline and compacted to 95% density using vibratory methods. Subsequent backfill shall be placed in 12" lifts at 95% density. The new pipeline shall be thoroughly flushed out through the adjacent hydrants immediately after backfilling.

Payment for watermain connections shall be included with the payment for each particular size of watermain and fittings used to make connection.

CONTAMINATED SOILS: The engineer is not aware of any contamination, but should we encounter a contaminated area, work shall cease and the specialized gaskets for use in contaminated areas will be used. Refer to AWWA C600 section 4.1 (**Permeation**), for instructions about how to proceed in contaminated work areas.

MEASUREMENT AND PAYMENT:

The completed work WATERMAIN and FITTINGS including all material, labor, and equipment, as measured will be paid at the contract unit price for the following contract items (pay items).

<u>Pay Item</u>	<u>Pay Unit</u>
Watermain, DI, _ inch, Tr Det G, Modified	Foot
Bend, _ inch, 45 Degree, DI MJ	Each
Bend, _ inch, 22.5 Degree, DI MJ	Each
Sleeve, _ inch, Long, DI MJ	Each
Tee, _ inch X _ inch, DI MJ	Each
Reducer, _ inch X _ inch, DI MJ	Each



ETNA SUPPLY - GRAND LEDGE
10801 GRAND RIVER HWY.
GRAND LEDGE, MI 48837
Phone 517 622 8696
Fax 517 622 8334



Acknowledgement

ORDER DATE	ORDER NUMBER
08/03/2022	S104677892
ETNA SUPPLY - GRAND LEDGE 10801 GRAND RIVER HWY. GRAND LEDGE, MI 48837 Phone 517 622 8696 Fax 517 622 8334	
PAGE NO. 1 of 1	

SOLD TO:

SHIP TO:

CITY OF MUSKEGON
1350 EAST KEATING
PUBLIC SERVICE BUILDING
MUSKEGON, MI 49442-6106

CITY OF MUSKEGON
1350 EAST KEATING
PUBLIC SERVICE BUILDING
MUSKEGON, MI 49442-6106

CUSTOMER NUMBER	CUSTOMER PO NUMBER	JOB NAME / RELEASE NUMBER	SALESPERSON	
21506	OLTHOFF PROJECT		Kevin Dieleman	
WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
Dalton Potgeter	DIRECT	NET 25TH	08/15/2022	No
ORDER QTY	DESCRIPTION		UNIT PRICE	EXT PRICE
	SHIPPING INSTRUCTIONS DELIVERY DATE:NEXT RUN DELIVERY TIME:B/4 3PM CONTACT NAME:MIKE CONTACT #:231-578-6495 ADD'L INSTR:			
1400ft	12" DI PIPE CL52 C/L S.J. (.37 WALL THICKNESS) GASKETS TYPED SEPERATELY		61.000/ft	85400.00
4440ft	8" DI PIPE CL52 C/L S.J. (.33 WALL THICKNESS) GASKETS TYPED SEPERATELY		37.000/ft	164280.00
180ft	6" DI PIPE CL52 C/L S.J.(.31 WALL THICKNESS) GASKETS TYPED SEPARATELY		26.000/ft	4680.00

I Acknowledge this Order

Signature: _____

Date: _____

Subtotal	254360.00
S&H Charges	0.00
Tax	0.00
Pymt & Disc	0.00
Amount Due	254360.00



ETNA SUPPLY - GRAND LEDGE
10801 GRAND RIVER HWY.
GRAND LEDGE, MI 48837
Phone 517 622 8696
Fax 517 622 8334



Acknowledgement

ORDER DATE	ORDER NUMBER
08/15/2022	S104677892
ETNA SUPPLY - GRAND LEDGE 10801 GRAND RIVER HWY. GRAND LEDGE, MI 48837 Phone 517 622 8696 Fax 517 622 8334	
PAGE NO. 1 of 1	

SOLD TO:

SHIP TO:

CITY OF MUSKEGON
1350 EAST KEATING
PUBLIC SERVICE BUILDING
MUSKEGON, MI 49442-6106

CITY OF MUSKEGON
1350 EAST KEATING
PUBLIC SERVICE BUILDING
MUSKEGON, MI 49442-6106

CUSTOMER NUMBER	CUSTOMER PO NUMBER	JOB NAME / RELEASE NUMBER	SALESPERSON	
21506	OLTHOFF PROJECT		Kevin Dieleman	
WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
Dalton Potgeter	OT OUR TRUCK	NET 25TH	08/23/2022	No
ORDER QTY	DESCRIPTION		UNIT PRICE	EXT PRICE
	SHIPPING INSTRUCTIONS DELIVERY DATE:NEXT RUN DELIVERY TIME:B/4 3PM CONTACT NAME:MIKE CONTACT #:231-578-6495 ADD'L INSTR:			
13ea	12 AMARILLO FAST-GRIP GASKET		300.000/ea	3900.00
15ea	8 AMARILLO FAST-GRIP GASKET		200.000/ea	3000.00
4ea	6 AMARILLO FAST-GRIP GASKET		150.000/ea	600.00

I Acknowledge this Order

Signature: _____

Date: _____

Subtotal	7500.00
S&H Charges	0.00
Tax	0.00
Pynt & Disc	0.00
Amount Due	7500.00

SECTION 02671

SPECIAL PROVISION
FOR
HYDRANT, 6 INCH, STANDARD

PART 1 GENERAL

1.1 DESCRIPTION

- A. This special provision defines and describes the methods and materials required to place new fire hydrants.

1.2 CITY OF MUSKEGON MATERIALS

- A. Hydrant:
1. Hydrants shall be East Jordan Iron Works 5BR250 or equal. Hydrants shall have two 2.5" hose connections threaded with City of Muskegon Standard threads (big six) and one 5" STORZ pumper connection. Hydrants shall open to the left utilizing a 1" nut. All hydrants shall be painted red. Hydrant inlets shall have 6" diameter mechanical joint connections. The hydrant shall be designed so that the nozzles can be reoriented with out digging up the assembly, and so that height extensions may be added at a later date. Hydrants shall have bronze interior parts including operating stems. Bronze to bronze main valve seats shall be required if seat removal is necessary for removing the valve assembly. All hydrants shall have a minimum bury of 6.5 feet and have a standard upper standpipe length. Hydrants shall come with dual drain outlets conforming to AWWA C502-14 Section 4.8.2. When hydrants are installed below the water table or in soils that are not permeable the brass drain hole bushing shall be removed and a threaded brass plug inserted into the drain hole (weep hole) as directed by the engineer.

1.3 CITY OF MUSKEGON CONSTRUCTION METHODS

- A. Where shown on the plans, the contractor shall place a new hydrant. The work shall include, but not limited too, materials, equipment, appurtenances and labor to excavate, place, and connect the new hydrant. The 12 inch x 6 inch tee shall be paid for separately. The new location for the hydrant shall be excavated, and the hydrant shall be set according to the Hydrant Detail on sheet 3 of the construction plans. Removal and disposal of existing hydrants shall be included in the payment for the new hydrants.

1.4 MEASUREMENT AND PAYMENT

- A. The completed work, Hydrant, 6 inch, Standard including all materials, labor and equipment, as measured will be paid for at the contract unit price for the following contract item (pay item).

Pay Item
Hydrant, 6 inch, Standard

Pay Unit
Each

SECTION 02735

SPECIAL PROVISION
FOR
DR STRUCTURE, LEACHING BASIN

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of providing all labor, equipment and materials necessary to build and install Drainage Structure, Leaching Basins, of the diameter specified, according to section 403 of the 2020 Michigan Department of Transportation (MDOT) Standard Specifications for Construction, as shown on the plans, as directed by the Engineer, and as specified herein.

1.2 CITY OF MUSKEGON MATERIALS

- A. Leaching Basin: Provide materials meeting section 403 of the 2020 MDOT Standard Specifications for Construction, the details shown on the plans, and as specified herein.
1. Stone backfill shall be washed 1 inch to 2 inch aggregate using native stone as noted on the plans. Limestone will not be allowed. Structure shall be set in 1 foot of stone and shall be backfilled with 2 foot of stone around the perimeter.
 2. Geotextile wrap shall be in accordance with section 910 of the 2020 MDOT Standards Specifications for Construction. The geotextile shall be installed between the stone and the sand backfill to prevent the wash of sand into the stone. Geotextile wrap around the leaching basin in lieu of around the stone backfill will not be permitted.

1.3 CITY OF MUSKEGON CONSTRUCTION METHODS

- A. Leaching Basin:
1. Construct drainage structures in accordance with section 403 of the 2020 MDOT Standards Specifications for Construction, the details shown on the plans and as specified herein.

1.4 MEASUREMENT AND PAYMENT

- A. Leaching Basin:
1. Payment for the above items shall include all materials, equipment and labor required to complete the work as described.

PAY ITEM

Dr Structure, _ inch dia, Leaching Basin

PAY UNIT

Each

2. **Dr Structure, _ inch dia, Leaching Basin** includes all labor, equipment, and materials necessary to complete the work as described above, including but not limited to excavating for drainage structure, removal and disposal of excavated materials, stone bedding, stone backfill, geotextile wrap, sand backfill, manhole steps

- (coated), perforations around the structure, precast reinforced “donut”, and openings for inlet and outlet pipes.
3. Drainage structure covers will be paid for separately.

SECTION 02736

SEWERS

PART 1 GENERAL

1.1 DEFINITION

- A. As used herein, sewers shall be considered to mean all pipes or conduits intended to transport storm water or waste water and lying within public rights-of-way or easements, including all appurtenances.

1.2 CONSTRUCTION METHODS

- A. Construction Methods. Unless Specified Otherwise, Shall conform to the most Current Michigan Department of Transportation Standard Specifications for Construction or subsequent revision thereof.

PART 2 MATERIALS

2.1 GENERAL

- A. All materials furnished by the Contractor must conform in all respects to the requirements of Division 2 Materials. Where reference specifications are used, they shall be considered as referring to the latest issue.

2.2 PIPE JOINTS

- A. All Pipe Joints must conform in all respects to the requirements of Division 2 Materials. Where reference specifications are used, they shall be considered as referring to the latest issue. When it is necessary to connect new pipe to existing pipe the connection will be made with the appropriate size Fernco. The Fernco connection unless specified shall be included in the payment for the new sewer pipe. When it is necessary to connect new pipe to existing structures, the connection unless specified shall be included in the payment for the new sewer pipe.

2.3 MANHOLE, CATCH BASIN AND INLET MATERIALS

- A. Concrete: For manhole bases, catch basin bases and inlets shall develop compressive strength of 3,500psi or better in 28 days.
- B. Brick: ASTM C-139, Lime-cement, laid radially.
- C. Mortar and Plaster: U-1 of ASTM C-55, one part Portland cement, one part Lime and three parts sand, or a prepared mortar mix. (ASTM C-91-Masonry cement).
- D. Manhole Steps: Shall be plastic or cast iron, 10 inch x 10 inch overall, tread depth of 5 inches, tread cross section – 1 inch x 1 inch, with 2 ½-inch average rail height.

- E. Manhole Castings shall be cast iron and conform to East Jordan no. 1045 or approved equal, The Manhole Cover shall have the City of Muskegon Logo cast into it.
- F. Precast Manhole and Catch Basin Units: ASTM C-478 or ASTM C-76 pipe. Joints for precast sections shall be O-ring rubber gasket joints similar to ASTM C-443. Holes for pipe openings shall not be more than 6 inches larger in diameter than the outside diameter of the pipe and shall be filled with non-shrink mortar, Sanitary sewer manholes shall have a Kor-N-Seal, or approved equal, flexible pipe-to-manhole connection, the connection unless specified shall be included in the payment for the new precast manhole. Precast bases shall be set on a 4" thick pea-gravel base.

2.4 DISPOSITION OF DEFECTIVE MATERIALS

- A. Any material found during the progress of the work to have cracks, flaws or other defects, will be rejected by the Engineer. All defective material furnished by the Contractor shall be promptly removed by him from the site. Any material furnished by the Owner and found defective shall be set aside by the Contractor and removed from the site by the Owner.

PART 3 LINE AND GRADE

3.1 STAKES BY OWNER

- A. The Owner will furnish all line and grade control. Re Staking required by changes or delay in Contractor's schedule or as a result of the Contractor's negligence shall be paid for by the Contractor.

3.2 LINE AND GRADE CONTROL

- A. Laser Beam:
 - 1. Line and grade controls will be established by the Owner at each laser setup point and at 25-foot, 50-foot and 100-foot points, and thereafter at 100-foot intervals to the next manhole. All other lines and grades necessary for the location and construction of the work, shall be established and maintained by competent personnel employed and paid by the Contractor. The laser beam projector is to be rigidly mounted to its support platforms(s). The Contractor is encouraged to control line and grade for the sewer by using the laser beam through the sewer being laid. Equipment must incorporate above-ground control to assure positive alignment. Either a laser beam projector or surveyor's transit will be required for line control. Any other equipment necessary to control atmospheric conditions in the pipe to keep line and grade to acceptable standards of accuracy shall be furnished and operated by the Contractor.
 - 2. The laser beam method selected must be approved by the Engineer, and is to be operated by competent personnel employed and paid by the Contractor. Prior to placement of each section of pipe, the laser target shall be repositioned in the pipe previously laid to recheck beam accuracy. If beam projection exceeds 600 feet, line and grade checks will be required at 50-foot intervals.

PART 4 CONSTRUCTION METHODS

4.1 CONSTRUCTION METHODS

- A. Construction Methods. Unless Specified Otherwise, Shall conform to the most Current Michigan Department of Transportation Standard Specifications for Construction or subsequent revision thereof.

PART 5 CONCRETE CRADLE

5.1 CONCRETE CRADLE

- A. Where concrete cradle is required, it shall be constructed as shown on the plans, and the concrete shall conform to the most Current Michigan Department of Transportation Standard Specifications for Construction or subsequent revision thereof and as specified on the plans.

PART 6 JOINTS ON ALL PIPE

6.1 JOINTS ON ALL PIPE

- A. Joints on all Pipe shall be painted with Manufacturer's approved lubricant or solvent and the joint fully made. If difficulty is encountered in seating, the joint shall be disassembled and carefully inspected for obstructions and proper dimensions.

PART 7 MANHOLES, CATCH BASINS AND INLETS

7.1 MANHOLES, CATCH BASINS AND INLETS

- A. All Manholes, Catch Basins and Inlets shall be precast, unless approved otherwise, the precast units shall be installed on a 4" pea gravel sub base with an even and full bearing, the pea gravel shall be included with the structure for payment.

7.2 MANHOLE INVERT

- A. Concrete Flow Channel shall be placed in all Manholes, The flow channel shall be the same diameter as the pipe, the concrete shall be formed to the spring line of the pipe and sloped up the inside manhole circumference. Or the pipe can be laid through the manhole. Then concrete shall be formed to the spring line of the pipe and sloped up the inside manhole circumference. The pipe above the spring line shall then be removed. The concrete shall conform to the most Current Michigan Department of Transportation Standard Specifications for Construction or subsequent revision thereof, or as specified in the plans.

7.3 CASTINGS

- A. Castings shall be set accurately to grade. Manhole castings in established pavements shall fit both the grade and crown of such pavements. Catch basin grates in concrete curb and gutters shall be set ½ inch below the gutter grade, and shall be in a plane parallel with the gutter pan.

PART 8 CONNECTIONS

8.1 EXISTING SEWERS

- A. Where a manhole exists at the point of connection of new and existing sewers, it shall be repointed and any loose bricks and/or blocks in the walls of the existing manhole shall be re-laid. The cost of such work shall be included in the contract price for the new sewer unless payments are specifically provided in the proposal. Connections of new sewers to existing sewers when encountered in construction and not shown on the plans shall be made where ordered by the Engineer. Such connections shall be made within a manhole except for house service and drain connections. When such sewer connections are made within an existing manhole, The cost of such work shall be included in the contract price for the new sewer unless payments are specifically provided in the proposal. When connections are made with sewers carrying sewage or water, a flume or dam must be installed and pumping maintained as necessary to keep the new work dry until the joints and the concrete have had sufficient time to set.

8.2 FUTURE SEWERS

- A. Connections for future sewers indicated on the plans shall be plugged or bricked off at the ends. The ends of such future connections in sizes 4" through 21" shall be sealed with an appropriate sized disc and with the same type of jointing material used on the new sewers. For sewers 24" and larger, the end of the sewer shall be bricked off and plastered on the outside. The cost of such work shall be included in the contract price for the new sewer unless payments are specifically provided in the proposal.

8.3 SERVICES

- A. Wyes for house service connections shall be placed at locations indicated in the field by the Engineer. All house service connection openings shall be "Y" branches with the spur set on the barrel of the pipe at an angle of 45° for pipe sizes to 24 inch. Tees or wyes may be used for pipe 24 inch and larger. Service connection openings in concrete pipe shall be cast in the upper quarter of the pipe with spur having standard bell dimensions for the service connection. Joint type and material on the services shall be the same as specified for the sewer. The ends of house service shall be closed with standard plugs or caps securely blocked to resist test pressure and sealed with the same jointing material used on the service pipe. House service connections to an existing sewer shall be made with the appropriate size Firinco style connection. The caps and firinco connectors shall be included in the contract price for the new sewer unless payments are specifically provided in the proposal. The location of new house service stubs at the lot line shall be marked by a 2 inch by 2 inch wooden stake which shall extend vertically from the plugged end of the service. The stake shall be cut off 4 inches below grade and a ½" x 2' steel rod placed along side the wood stake. The Contractor shall assist the engineer for service connection measurements, measurements are to be taken to the nearest downstream manhole, and the ends of services by measurements from permanent surface witness points. House services shall be laid at right angles to the street line unless otherwise directed and shall be laid on a uniform line unless otherwise directed and shall be laid on uniform line and grade from the riser to the property line unless otherwise specified. The minimum depth at the property line shall be 8 feet below the approved street grade centerline. Where this depth cannot be obtained, the house connection shall be laid with a minimum rise of 1/8 inch per foot between the sewer and the

property line. Depths greater than 8 feet at property line may be required where basement elevations are lower than normal.

PART 9 TESTING

9.1 PIPE TESTING

- A. All tests shall be under the supervision of the Engineer, Prior to connecting any active sewer services or extending services beyond the property line, unless specified otherwise, the new sewers and services shall be tested for alignment and leakage. All plastic pipes shall have mandrel testing performed 30 days after placement; the mandrill size shall be 95% of the manufactures actual inside diameter. The sewer shall be thoroughly cleaned before the Engineer is requested to witness or perform any tests.

9.2 ALIGNMENT

- A. Sewers must be straight between manholes and will be tested for straightness by video taping from manhole to manhole, the video taping will be done by the City at on cost to the Contractor.

9.3 LEAKAGE

- A. Unless otherwise called for in the project specifications, the maximum allowable infiltration/exfiltration shall be 299 gallons per day, per inch of diameter, per mile of pipe for ASTM C-443 and ASTM C-425 joints. The joints shall be tight and any visible leakage in the joints and leakage in excess of that specified shall be repaired.
 - 1. Water Testing: The Contractor shall furnish, install and maintain a "V" notch weir, tightly secured to the low end of each section of sewer, so that the infiltration may be checked. When the infiltration is demonstrated to be within the allowable limits, the Contractor shall remove the weirs and all framing, leaving the sewers and manholes clean and free of any debris. Exfiltration tests will be required only when the natural or induced ground water table is less than 2 feet over highest point in pipeline under test, including house services. Exfiltration tests shall be made by filling the line to a minimum depth of 2 feet above the high point of the line under test, with allowance for ground water level, and measuring the water required to maintain this level.
 - 2. Low Pressure Air Testing: The Contractor shall furnish all equipment and personnel to conduct an acceptance test using low pressure air. Pipe shall be cleaned and all outlets plugged and securely replaced before beginning test.

PART 10 METHOD OF MEASUREMENT

10.1 METHOD OF MEASUREMENT

- A. The length of sewer will be measured in lineal feet from center to center of manholes. The house connections will be measured in lineal feet horizontally, from the center line of the sewer to the end of the pipe.

PART 11 BASIS OF PAYMENT

11.1 SEWER PIPE

- A. "Vitrified pipe sewer," "Reinforced concrete pipe sewer," and "Plastic pipe sewer" of the specified diameters will be paid for at the contract unit price per lineal foot, which price shall be payment in full for all excavation, backfill, disposal of excess material, furnishing materials, (except when the City furnishes all or part of the materials) including wyes, tees and other fittings, and installing the pipe complete.

11.2 HOUSE CONNECTIONS

- A. House connections will be paid for at the contract unit price per lineal foot for installing pipe complete.

11.3 CONCRETE CRADLE

- A. "Concrete Cradle" will be paid for at the contract unit price per lineal foot for the work complete.

LOW PRESSURE AIR TESTMINIMUM HOLDING TIME IN SECONDS REQUIRED FOR
PRESSURE TO DROP FROM 3-1/2 TO 2-1/2 PSIG

	PIPE DIAMETER													
	4"	6"	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	39"
25	4	10	18	28	40	62	89	121	158	200	284	299	356	418
50	9	20	35	55	79	124	178	243	317	401	495	599	713	837
75	13	30	53	83	119	186	267	364	475	601	743	898	1020	1105
100	18	40	70	110	158	248	356	485	634	765	851	935		
125	22	50	88	138	198	309	446	595	680					
150	26	59	106	165	238	371	510							
175	31	69	123	193	277	425								
200	35	79	141	220	317									
225	40	89	158	248	340									
250	44	99	176	275										
275	48	109	194	283										
300	53	119	211											
350	62	139	227											
400	70	158												
450	79	170												
500	88													
550	97													
600	106													
650	113	170	227	283	340	425	510	595	680	765	851	935	1020	1105

END OF SECTION

SECTION 02737

SPECIAL PROVISION
FOR
CATCH BASIN, SPECIAL, 48 INCH DIA

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of constructing a Drainage Structure in accordance with Section 403 of the Standard Specifications for Construction, except as modified herein.

1.2 CITY OF MUSKEGON MATERIALS

- A. Catch Basin:
1. All structures shall be precast units unless permission is granted by the Engineer to use brick and/or block for their construction. Concrete footing shall be 3500 psi concrete compressive strength in 28 days. Brick shall be ASTM C-139 Lime Cement, laid radially. Precast Catch Basins shall be ASTM C-478. Holes for pipe openings shall not be more than 6" larger than the outside diameter of the pipe and shall be filled with non-shrink mortar.
 2. Backfill material shall meet the grading requirements for Granular Class II.

1.3 CITY OF MUSKEGON CONSTRUCTION METHODS

- A. Catch Basin:
1. The work covered by this special provision shall be in accordance with the applicable requirements in Section 403 of the Standard Specifications for Construction and details as shown on plans.

1.4 MEASUREMENT AND PAYMENT

- A. Catch Basin:
1. The completed work, Catch Basin, Special, 48 inch dia, including all materials, labor and equipment, will be paid for at the contract unit price for the following contract item (pay item).

PAY ITEM

Catch Basin, Special, 48 inch dia

PAY UNIT

Each

SECTION 02738

SPECIAL PROVISION
FOR
DR STRUCTURE COVER, TYPE __, MODIFIED

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of furnishing and installing drainage structure covers at the locations shown on the plans according to section 403 of the Standard Specifications for Construction, except as modified herein.

1.2 CITY OF MUSKEGON MATERIALS

- A. Dr Structure Cover:
1. Provide casting in accordance with section 403 of the Standard Specifications for Construction and as shown on the plans. Provide castings from one of the following manufacturers, or approved equal:
 - a. EJ
 - b. Neenah Foundry
 2. On this project the following drainage structure cover will be used:
 - a. Dr Structure Cover, Type K, Modified shall conform to Curb style Catch Basin casting East Jordan #7045 or equal (@ 490 lbs. each)

1.3 CITY OF MUSKEGON CONSTRUCTION METHODS

- A. Dr Structure Cover:
1. The work covered by this special provision shall be in accordance with the applicable requirements in Section 403.

1.4 MEASUREMENT AND PAYMENT

- A. Dr Structure Cover:
1. The completed work, Drainage Structure Cover, Type __, Modified including all materials, labor and equipment, as measured will be paid for at the contract unit price for the following contract item (pay item).

PAY ITEM

Dr Structure Cover, Type K, Modified

PAY UNIT

Each

SECTION 02739

SPECIAL PROVISION
FOR
DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of adjusting drainage structures in accordance with section 403 of the Standard Specifications for Construction, as shown in the plans, and as stated herein.

1.2 CITY OF MUSKEGON MATERIALS

- A. Dr Structure Cover Adj:
1. The materials shall meet the requirements specified in Section 403.02 of the 2020 MDOT Standard Specifications for Construction.

1.3 CITY OF MUSKEGON CONSTRUCTION METHODS

- A. Dr Structure Cover Adj:
1. The work covered by this special provision shall be in accordance with the applicable requirements in Section 403.03, and shall also include the following:
a. Drainage Structure, Temporary Lowering will be included in pay item Dr Structure Cover, Adj, Case I, Modified. No payment for Dr Structure, Temporary Lowering will be allowed for the work of removing existing castings and steel plating of the drainage structure holes. This work will be included in the payment for Dr Structure Cover, Adj, Case I, Modified
b. Replacement of pavement adjacent to the adjusted cover shall be constructed according to the DRAINAGE STRUCTURE COVER ADJUST DETAIL shown on the construction plans.
c. Payment includes adjusting the cover up or down, a maximum of **6 inches**, to the required elevation.

1.4 MEASUREMENT AND PAYMENT

- A. Dr Structure Cover Adj:
1. The completed work, Dr Structure Cover, Adj., Case 1, Modified, including all materials, labor, and equipment, as measured, will be paid at the contract unit price for the following contract item (pay item).

PAY ITEM

Dr Structure Cover, Adj, Case 1, Modified

PAY UNIT

Each

SECTION 02990

PERMITS

PART 1 GENERAL

1.1 GENERAL

- A. The Permits included in this Section have been applied for by the Owner with the cost to the Contractor noted. They are provided as information for the Contractor because the requirements and regulations contained in these documents shall be adhered to by the Contractor as they pertain to the work done under this Contract.
- B. Should any contradictions or discrepancies between the requirements of the Permits Section and other Sections of these Specifications be found, this sections language shall have precedence.

1.2 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 00800 - General Supplementary Conditions
- C. Section 01000 - General Specifications
- D. Section 02200 – Earthwork
- E. Section 02220 - Soil Erosion Control

1.3 PERMIT

- A. The following permits are contained hereinafter with costs to the Contractor noted.
 - 1. Soil Erosion and Sediment Control Permit -

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 11510
SAFETY EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Splash goggles
- B. Gloves
- C. Aprons
- D. Boots
- E. Self-Contained Breathing Apparatus (SCBA)
- F. Ear muffs
- G. Ladder fall arrest devices
- H. First aid kit

1.2 REFERENCES

- A. ANSI A117.1 - Safety Standards for the Handicapped.
- B. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- C. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- D. ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- E. ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- F. Michigan Department of Labor, Occupational Safety Standards for General Industry (MIOSHA): Part 33 - Personal Protective Equipment.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data on accessories describing size, components, details of fabrication, attachment methods (as required) etc.

1.4 REGULATORY REQUIREMENTS

- A. Conform to Michigan Department of Labor, Occupational Safety Standards for General Industry, Part 33 - Personal Protective Equipment, (MIOSHA).
- B. Mine Safety and Health Administration, (MSHA).

1.5 COORDINATION

- A. Coordinate work under provisions of Section 01039.

PART 2 PRODUCTS

2.1 MANUFACTURERS, SUPPLIERS

- A. McMaster-Carr Supply Company
- B. Grainger Industrial Equipment and Supply
- C. Lab Safety Supply
- D. Substitutions: Under provisions of Section 01300.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01039.
- B. Verify exact location of accessories for installation.

3.2 PREPARATION

- A. Provide templates and rough-in measurements as may be required for the equipment specified.

3.3 INSTALLATION

- A. Install accessories and equipment in accordance with manufacturers' instructions and governing regulations.

3.4 EQUIPMENT

- A. Splash goggles, top vented, oversized for fit over glasses; (2) pair required:
 - 1. Lab Safety # QA-8866
- B. Chemical resistant, milled neoprene gloves, 30 mils., size large; (2) pair required:
 - 1. McMaster Carr # 5307T9 or
 - 2. Lab Safety # WW-1425 (Pioneer "Stanzoil")

- C. Neoprene coated cotton apron; 2 required:
 - 1. McMaster Carr # 5248T7 or
 - 2. Lab Safety # QA-6181
- D. Pullover legging boots, size 11; 2 pair required:
 - 1. McMaster Carr # 51995T21
- E. Self-Contained Breathing Apparatus (SCBA), low pressure cylinder unit with 30 minute duration and storage case; 1 unit required:
 - 1. McMaster Carr # 5569T55 or
 - 2. Grainger Industrial # 3T960 (North Model 812K)
- F. Ear muffs, over the head noise reduction rating (NRR) 29dB; 2 pair required:
 - 1. McMaster-Carr "Silent Max" # 53295T56 or
 - 2. Lab Safety "Thunder 29" # QA-13370
- G. Ladder fall arrest devices, System shall be complete with center mounted rail, sliding sleeve, safety belt and all appropriate attachment hardware. Complete system shall have all components made of stainless steel, fiberglass, or a combination of the two, except for the safety belt.
 - 1. McMaster-Carr Stainless Steel Rail # 8272T51
 - 2. McMaster-Carr Stainless Steel Sliding Sleeve # 8272T12
 - 3. McMaster-Carr Stainless Steel Mounting Bracket # 8272T52
 - 4. McMaster-Carr Nylon Safety Belt # 8272T16
 - 5. Precision Stair Corporation, similar type system
- H. Ladder fall arrest device center mounted rail shall be in accordance with all MIOSHA regulations, and installed on all ladders 20'-0" or greater in climbing height. Provide 6 sliding sleeves and 6 safety belts to the Owner at Substantial Completion.
- I. First Aid Kit: McMaster-Carr kit # 5533T12.

END OF SECTION