

SPECIFICATIONS
FOR
2023 SIDEWALK IMPROVEMENT PROGRAM
CITY OF WIXOM
OAKLAND COUNTY, MICHIGAN

FEBRUARY, 2023

HRC JOB NO. 20220938



105 W. Grand River Ave
Howell, Michigan 48843

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SECTION 00030
ADVERTISEMENT FOR BIDS

2023 SIDEWALK IMPROVEMENT PROGRAM
CITY OF WIXOM
OAKLAND COUNTY, MICHIGAN

Sealed proposals for the construction of the 2023 Sidewalk Maintenance Program Project will be received by the City of Wixom offices located at 49045 Pontiac Trail, Wixom, MI 48393, until **10 a.m. Local Time on March 21, 2023**, at which time and place all bids will be publicly opened and read. Bids must be sealed in an envelope with “2023 Sidewalk Maintenance Program” marked on the outside.

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

Sidewalk and landscaping improvements in downtown area including the following items of work and approximate quantities (See Section 00300 – Proposal for actual items and quantities):

Brick Paver, Rem	440 Syd
Sidewalk, Rem	305 Syd
Granular Material	92 Syd
Sidewalk, Conc, 4 inch	7,150 Sft
Sidewalk Ramp, Conc, 6 inch	50 Sft
Shredded Hardwood Bark Mulch	15 Cyd
Coreopsis x Verticilla 'Daybrake' -1 Gal	36 Ea
Rose 'Knockout' Carpet Rose -3 Gal	24 Ea
Juniperus Pro. 'Nana' Japanese Garden Juniper -3 Gal	18 Ea
Lavandula x Inter. 'Phenomenal' Lavendar -1 Gal	48 Ea
Campanula Carpathion - Bellflower -1 Gal	32 Ea
Rudbeckia 'Praire Sun' -1 Gal	32 Ea
Sedums 'Autumn Joy' -1 Gal	36 Ea
Spirea x Bumalda 'Anthony Waterer' -3 Gal	10 Ea
Ginko Biloba -1.5" Cal B&B	5 Ea
Restoration	150 Syd
Irrigation System	30,000 Dlr

The City of Wixom officially distributes bid documents through the Michigan Intergovernmental Trade Network (MITN). Copies of documents obtained from any other source are not considered official copies. Only those vendors who obtain documents from the MITN system are guaranteed access to receive addendum information if such information is issued. If you obtained this document from a source other than MITN, it is recommended that you register on the MITN site, www.mitn.info and obtain an official copy and any addenda. The City of Wixom also reserves the right to use any other method of advertising and/or distributing bid information; however, any additional method of distribution will also direct vendors to MITN.

Questions, comments, or concerns of any bidder regarding bidding or the contract documents must be submitted in writing by 3:00 p.m. on **March 14, 2023**. No inquiry received after that date will be given consideration. Submit all questions to Engineer at:

Andy Malczewski
amalczewski@hrcengr.com
Hubbell, Roth & Clark, Inc.

Contractors or Subcontractors performing the work of this contract shall be required to submit previous relevant experience in order to be considered.

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 Wixom 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 Wixom. No bid may be withdrawn after scheduled closing time for receiving bids for at least sixty (60) days.

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

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

City of Wixom
49045 Pontiac Trail
Wixom, Michigan 48393

Catherine Buck, City Clerk
248-624-4557

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.

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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 affected.

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

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PROPOSAL
FOR
2023 SIDEWALK IMPROVEMENT PROGRAM
CITY OF WIXOM
OAKLAND COUNTY, MICHIGAN

City of Wixom
49045 Pontiac Trail
Wixom, MI 48393
248-624-4557

Bids Due: March 21, 2023
On or before 10 am, Local Time
HRC Job No. 20220938

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 they have examined the plans, specifications, and all other information referenced in the Instructions to Bidders, and 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 they have not received or relied upon any representations or warranties of any nature whatsoever from the City of Wixom, its agents or employees, as to any conditions to be encountered in accomplishing the work and that their bid is based solely upon the bidder's own independent judgment.

The above, as bidder, hereby certifies that they have examined the plans, specifications, and other data provided by the Owner for bidding purposes. Further, the undersigned certifies that they have reviewed the proposed construction methods and finds them acceptable for the conditions which they anticipates from the information provided for bidding.

The Bidder hereby declares that the he/she has inspected the site of work 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 their own determination as to existing soil conditions and they shall also complete the work under whatever conditions they may create by his own sequence of construction, construction methods, or other conditions they may create, at no additional cost to the Owner.

The above, as Bidder, declares that they have familiarized themselves with the location of the proposed 2023 SIDEWALK IMPROVEMENT PROGRAM and appurtenant construction in the City of Wixom, Oakland County, Michigan, and the conditions under which it must be constructed; also that they have carefully examined the Plans, Specifications, and Contract Documents which they understand and accepts as sufficient for the purpose of constructing said 2023 SIDEWALK IMPROVEMENT PROGRAM, and appurtenant work, and agrees that they will contract with the City of Wixom to furnish all labor, materials, tools, equipment, facilities and supervision necessary to do all the work specified and prescribed for the City of Wixom, 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 that they will accept in full payment therefore the sum of:

BASE BID

	Item Description	Quantity	Unit	Unit Price	Total Cost
1	Mobilization, Max 10%	1	LS	\$	\$
2	Tree, Rem, 6 inch to 18 inch	4	Ea	\$	\$
3	Curb and Gutter, Rem	70	Ft	\$	\$
4	Sidewalk, Brickwork, Rem, Special	440	Syd	\$	\$
5	Sidewalk, Rem	305	Syd	\$	\$
6	Exploratory Investigation, Vertical	50	Ft	\$	\$
7	Station Grading, Special	4.15	Sta	\$	\$
8	Granular Material, CL II	92	Cyd	\$	\$
9	Erosion Control, Inlet Protection, Fabric Drop	2	Ea	\$	\$
10	Aggregate Base, 8 inch, 21AA, Special	30	Syd	\$	\$
11	Maintenance Gravel	10	Ton	\$	\$
12	Curb and Gutter, Conc, Match Existing, Special	60	Ft	\$	\$
13	Detectable Warning Surface	10	Ft	\$	\$
14	Curb Ramp Opening, Conc	10	Ft	\$	\$
15	Sidewalk, Conc, 4 inch	7,150	Sft	\$	\$
16	Sidewalk Ramp, Conc, 6 inch	50	Sft	\$	\$
17	Barricade, Type III, High Intensity, Double Sided, Furn	4	Ea	\$	\$
18	Barricade, Type III, High Intensity, Double Sided, Oper	4	Ea	\$	\$
19	Pedestrian Type II Barricade, Temp	2	Ea	\$	\$
20	Channelizing Device, 42 inch, Furn	50	Ea	\$	\$
21	Channelizing Device, 42 inch, Oper	50	Ea	\$	\$
22	Minor Traf Devices	1	LS	\$	\$
23	Plastic Drum, High Intensity, Furn	50	Ea	\$	\$
24	Plastic Drum, High Intensity, Oper	50	Ea	\$	\$
25	Sign, Type B, Temp, Prismatic, Furn	373	Sft	\$	\$
26	Sign, Type B, Temp, Prismatic, Oper	373	Sft	\$	\$
27	Sign, Type B, Temp, Prismatic, Special, Furn	72	Sft	\$	\$
28	Sign, Type B, Temp, Prismatic, Special, Oper	72	Sft	\$	\$
29	Lighted Arrow, Type C, Furn	1	Ea	\$	\$
30	Lighted Arrow, Type C, Oper	1	Ea	\$	\$
31	Sign, Type III, Erect, Salv	3	Ea	\$	\$
32	Post Hole Through Conc for Steel Post	1	Ea	\$	\$
33	Post, Steel, 3 lb	30	Ft	\$	\$
34	Traf Regulator Control	1	LS	\$	\$
35	Shredded Hardwood Bark Mulch	15	Cyd	\$	\$
36	Coreopsis x Verticilla 'Daybrake' -1 Gal	36	Ea	\$	\$
37	Rose 'Knockout' Carpet Rose -3 Gal	24	Ea	\$	\$
38	Juniperus Pro. 'Nana' Japanese Garden Juniper -3 Gal	18	Ea	\$	\$

	Item Description	Quantity	Unit	Unit Price	Total Cost
39	Lavandula x Inter. 'Phenomenal' Lavendar -1 Gal	48	Ea	\$	\$
40	Campanula Carpathion - Bellflower -1 Gal	32	Ea	\$	\$
41	Rudbeckia 'Praire Sun' -1 Gal	32	Ea	\$	\$
42	Sedums 'Autumn Joy' -1 Gal	36	Ea	\$	\$
43	Spirea x Bumalda 'Anthony Waterer' -3 Gal	10	Ea	\$	\$
44	Ginko Biloba -1.5" Cal B&B	5	Ea	\$	\$
45	Bike Rack, Special	1	Ea	\$	\$
46	Bench, Special	1	Ea	\$	\$
47	Trash Receptacle, Special	1	Ea	\$	\$
48	Planter Box, Special	530	Ft	\$	\$
49	Plant Mix, Special	75	Cyd	\$	\$
50	Tree Grate with Tree Guard, Special	5	Ea	\$	\$
51	Turf Establishment, Special	150	Syd	\$	\$
52	Irrigation System, Special	30,000	Dlr	\$	\$
53	Color Audio Video Route Survey, Special	1	LS	\$	\$
54	Reimbursed Permit Fees, Special	5,000	Dlr	\$	\$

Total Construction Costs \$

ALTERNATES

Voluntary Alternates proposed by the Bidder will not be considered. The Bidder shall submit his bid based on the information shown on the Drawings and Specifications

The Owner reserves the right to award the Base Bid depending upon the availability of funds.

The Owner, at their 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 Wixom 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.

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

Open to Traffic

Sidewalk work cannot begin until **May 1, 2023**.

All work, other than the delayed acceptance requirements for Turf Establishment, shall be sufficiently complete and in suitable condition to be designated "Approved for Traffic" and shall be Opened to Traffic as directed by the Engineer, on or before **June 30, 2023**. The "Approved for Traffic" condition shall be as defined in section 107.21, Approved for Traffic, of the MDOT 2020 Standard Specifications for Construction.

Entire Project

The entire project including all punch list items, all traffic control devices must be picked up and the site shall be made acceptable (approved by the Owner) and acceptance for Turf Establishment shall be completed on or before **July 14, 2023**.

Failure on the part of the Contractor to meet each of the above milestones by the date specified shall result in the assessment of Liquidated Damages against the Contractor as provided in Section 108.10, Liquidated Damages, of the MDOT 2020 Standard Specifications for Construction.

LIQUIDATED DAMAGES

Time is of the essence for completion of this project in order to have the Project ready for the City of Wixom. The Bidder guarantees that he/she can and will complete the work within the time limit stated hereinbefore 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 Nine Hundred Dollars (\$900.00), 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 **August 12, 2022** 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 90 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 his/her 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 City of Wixom

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

Company Name: _____

Signature: _____

Printed Name: _____ 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 his/her business address to which all notices, directions or other communications may be served or mailed:

Street _____

City _____

State _____ Zip Code _____

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

- INDIVIDUAL
- INDIVIDUAL DOING BUSINESS UNDER AN ASSUMED NAME
- CO-PARTNERSHIP
The Assumed Name of the Co-Partnership is registered in the County of _____, Michigan
- CORPORATION INCORPORATED UNDER THE LAWS OF THE STATE OF _____
_____. The Corporation is
- LICENSED TO DO BUSINESS IN MICHIGAN
- NOT NOW LICENSED TO DO BUSINESS IN MICHIGAN

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

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 _____, 2022.

By (Signature)

Printed Name of Signer

Title

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that 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 _____ Dollar (\$ _____),

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 his/her obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____, 2022

(Witness)

(Principal)

(Seal)

(Title)

(Witness)

(Surety)

(Title)

END OF SECTION

CONTRACT

ARTICLES OF AGREEMENT, Made and entered into this ___ day of _____, 2023, by and between

The City of Wixom (A Michigan Municipal Corporation), 49045 Pontiac Trail, Wixom, MI 48393

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

in the _____, County of Oakland

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.

2023 SIDEWALK IMPROVEMENT PROGRAM

HRC Job No. 20220938

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.

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

WITNESS:

City of Wixom
(A Michigan Municipal Corporation)
Party of the First Part

Printed Name:

By: _____
Patrick Beagle, Mayor

Printed Name:

Catherine Buck, City Clerk

WITNESS:

Party of the Second Part

Printed Name:

By: _____
_____, Owner/Member

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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"

City of Wixom

49045 Pontiac Trail

Wixom, MI 48393

in the full and just sum of _____

(\$ _____) 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 _____ 2023.

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

shall well and faithfully do and perform the things agreed by _____
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.

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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) _____

_____, Owner/Member (Seal)

Principal

Signature: _____ (Seal)
Printed Name:
Title:

Surety

Signed, Sealed and Delivered
in the Presence of:

Signature: _____
Printed Name:

Signature: _____
Printed Name:

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 the City of Wixom, 49045 Pontiac Trail, Wixom, MI 48393

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., 2023.

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

City of Wixom

dated the _____ day of _____, A.D., 2023, wherein said Principal has covenanted and agreed as follows, to-wit:

To furnish all the labor and material _____

For the 2023 SIDEWALK IMPROVEMENT PROGRAM

HRC Job No. 20220938

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.

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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.

By: _____
_____, Owner/Member

Principal

By: _____
Printed Name:
Title:

Surety

Signed, Sealed and Delivered
in the Presence of:

Signature: _____
Printed Name:

Signature: _____
Printed Name:

MAINTENANCE AND GUARANTEE BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____

as Principal, and _____

_____ are held and firmly bound unto _____ the City of Wixom, 49045 Pontiac Trail, Wixom, MI 48393

in the sum of _____ Dollars (\$ _____)

good and lawful money of the United States of America, to be paid to the _____ City of Wixom. 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., 2023.

WHEREAS, the above-named principal has entered into a certain written contract with the _____ City of Wixom

dated this ___ day of _____ A.D., 2023, where in the said principal covenanted and agreed as follows, to wit:

for the: 2023 SIDEWALK IMPROVEMENT PROGRAM

_____ HRC Job No. 20220938

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that by and under such contract, the above named principal has agreed with the City of Wixom that for a period of two (2) 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 two (2) 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 _____, 2023.

Signed, Sealed and Delivered
in the Presence of:

"Principal"

Signature: _____
Printed Name:

_____, Owner/Member (L.S.)

"Surety"

Signature _____
Printed Name:

By: _____ (L.S.)
Printed Name:
Title:

CONTRACTOR'S AFFIDAVIT

STATE OF MICHIGAN)
SS.
COUNTY OF OAKLAND)

The undersigned _____
hereby represents that on _____ (he) (it) was awarded
a Contract by City of Wixom
hereinafter called the Owner, to _____
_____ in accordance with the terms and
conditions of Contract No. 20220938; and the undersigned further represents 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 project, as well as all other claims arising from the
performance of the said Contract, have been fully paid or satisfactorily settled. The undersigned further
agrees that if any such claim should hereinafter 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, _____, Co., MI
My Commission Expires: _____

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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, sue for, or claim
compensation from _____
the Owner, or his agents, in addition to the regular items set forth in the Contract numbered 20220938 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: _____

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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

Principal reference lines or points and benchmarks shall be given by the Engineer at such time as he may deem necessary; or if the Contractor shall be in need of such reference lines or bench marks, he shall notify the Engineer forty-eight (48) hours in advance, excluding Saturdays, Sundays and holidays. The Engineer will set suitable stakes and marks showing the locations and elevations of new underground utilities as part of the work and will furnish the Contractor with "cut sheets" referred to the reference points. No work shall be undertaken until such stakes and marks shall have been set by the Engineer. The Contractor shall take due and proper precautions for the preservation of these stakes and marks and shall see to it that the work at all times proceeds in accordance therewith and shall provide all labor and material to set control and locate the work accurately with reference to the above points. All lines and grades for new above grade structures and appurtenances 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 may be 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. Shrubby 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 Contractors 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 ensuring 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 ensure 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.

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.

PUBLIC ACT 57
STATE OF MICHIGAN
89th LEGISLATURE
REGULAR SESSION OF 1998

Introduced by Reps. Middaugh, Alley, Brackenridge, Olshove, Dobronski, Griffin, Gernaat, Walberg, Rhead, Richner, Kukuk, Callahan, Murphy, Thomas, Leland, Profit, Palamara, Wetters, McNutt, Varga, Gagliardi, Gustafson, Kilpatrick, Sikkema, Schermesser, Birkholz, Bodem, Dobb, Raczkowski and Perricone

ENROLLED HOUSE BILL NO. 5607

AN ACT to require contractors to provide certain notices to governmental entities concerning improvements on real property; to allow for the modification of contracts for improvement to real property; to provide for remedies; and to repeal acts and parts of acts.

The People of the State of Michigan enact:

Sec. 1. As used in this act:

(a) "Contractor" means a person who contracts with a governmental entity to improve real property or perform or manage construction services. Contractor does not include a person licensed under Article 20 of the Occupational Code, 1980 PA 299, MCL 339.2001 to 339.2014.

(b) "Governmental Entity" means the state, a county, city, township, village, public educational institution, or any political subdivision thereof.

(c) "Improve" means to build, alter, repair, or demolish an improvement upon, connected with, or beneath the surface of any real property, to excavate, clear, grade, fill, or landscape any real property, to construct driveways and roadways, or to perform labor upon improvements.

(d) "Improvement" includes, but is not limited to, all or any part of any building, structure, erection, alteration, demolition, excavation, clearing, grading, filling, landscaping, trees, shrubbery, driveways, and roadways on real property.

(e) "Person" means an individual, corporation, partnership, association, governmental entity, or any other legal entity.

(f) "Real Property" means the real estate that is improved, including, but not limited to, lands, leaseholds, tenements, hereditaments, and improvements placed on the real property.

Sec. 2. A contract between a contractor and a governmental entity for an improvement that exceeds \$75,000.00 shall contain all of the following provisions:

(a) That if a contractor discovers 1 or both of the following physical conditions of the surface or subsurface at the improvement site, before disturbing the physical condition, the contractor shall promptly notify the governmental entity of the physical condition in writing.

(i) A subsurface or latent physical condition at the site is differing materially from those indicated in the improvement contract.

(ii) An unknown physical condition at the site is of an unusual nature differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the improvement contract.

(b) That if the governmental entity receives a notice under subdivision (a), the governmental entity shall promptly investigate the physical condition.

(c) That if the governmental entity determines that the physical conditions do materially differ and will cause an increase or decrease in costs or additional time needed to perform the contract, the governmental entity's determination shall be made in writing and an equitable adjustment shall be made and the contract modified in writing accordingly.

(d) That the contractor cannot make a claim for additional costs or time because of a physical condition unless the contractor has complied with the notice requirements of subdivision (a). The governmental entity may extend the time required for notice under subdivision (a).

(e) That the contractor cannot make a claim for an adjustment under the contract after the contractor has received the final payment under the contract.

Sec. 3. (1) If the contractor does not agree with the governmental entity's determination, with the governmental entity's consent the contractor may complete performance on the contract.

(2) At the option of the governmental entity, the contractor and the governmental entity shall arbitrate the contractor's entitlement to recover the actual increase in contract time and costs incurred because of the physical condition of the improvement site. The arbitration shall be conducted in accordance with the rules of the American Arbitration Association and judgment rendered may be entered in any court having jurisdiction.

Sec. 4 If an improvement contract does not contain the provisions required under Section 2, the provisions shall be incorporated into and considered part of the improvement contract.

Sec. 5 This Act does not limit the rights or remedies otherwise available to a contractor or the governmental entity under any other law or statute.

Sec. 6 This Act is repealed effective December 31, 2001.

Enacting Section 1. This Act takes effect 180 days after the date this Act is enacted.

This Act is ordered to take immediate effect.

(Signed by John Engler, Governor of Michigan, at 3:00 p.m. on April 8, 1998)

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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

Jay E. Randall

Clerk of the House of Representatives

Approved

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Governor

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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.

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**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: _____

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

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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.
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- (c) “Investment activity” means 1 or more of the following:
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- (d) “Iran” means any agency or instrumentality of Iran.
- (e) “Iran linked business” means either of the following:
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 - (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).

(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).

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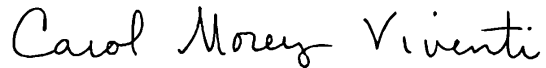
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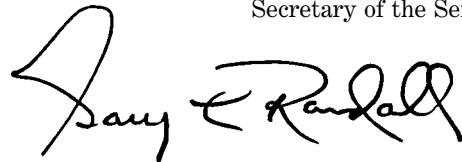
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Enacting section 1. This act takes effect April 1, 2013.

This act is ordered to take immediate effect.



Secretary of the Senate



Clerk of the House of Representatives

Approved

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Governor

Statewide Prohibition Against Iran-Linked Businesses

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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
 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their counsel, 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 counsel, 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 counsel, 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
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their counsel, 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
 - 2. The policy shall include an endorsement which includes the following as additional insured's:
 - a. The Owner, their counsel, 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 - CompensationStatutory
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 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 PAVCOR

ACORD™ CERTIFICATE OF LIABILITY INSURANCE DATE (MM/DD/YYYY)
04/02/2015

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.

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).

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): 248 111-1111 E-MAIL: InsuranceAgent@InsuranceGroup.com ADDRESS: _____ 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:			
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.									
INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
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: POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	X	X	MPA00000042433S	11/17/2014	11/17/2015	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 - COMPROP AGG	\$2,000,000	
								\$	
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS 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	11/17/2014	11/17/2015	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	11/17/2014	11/17/2015	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	05/01/2014	04/30/2015	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> 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	11/17/2014	11/17/2015		\$150,000	\$1,000 deductible

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
 Municipality Name, their counsel, members, board members, public officials, consultants, agents and
 (See Attached Endorsements evidencing the change of policy)

CERTIFICATE HOLDER Municipality Name 18500 Street Name AnyCity, MI 48025	CANCELLATION 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 <div style="text-align: right;">SIGNATURE</div>
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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

SPREXC

ACORD™ INSURANCE BINDER		DATE 06/18/14	
THIS BINDER IS A TEMPORARY INSURANCE CONTRACT, SUBJECT TO THE CONDITIONS SHOWN ON THE REVERSE SIDE OF THIS FORM.			
PRODUCER Insurance Company Name Any Street City, State Zip	PHONE (A/C, No, Ext): 248-555-5555 FAX (A/C, No): 248-333-3333	COMPANY Selective Insurance Company of Amer	BINDER # BINDER83730
CODE: 38-3112729	SUB CODE:	DATE EFFECTIVE 06/18/14	TIME 12:01
AGENCY CUSTOMER ID: 7430	INSURED Owner's Name Any Street SomeCity, MI 48001	EXPIRATION DATE 08/18/14	TIME <input checked="" type="checkbox"/> 12:01 AM <input type="checkbox"/> NOON
DESCRIPTION OF OPERATIONS/VEHICLES/PROPERTY (Including Location) Project Description		THIS BINDER IS ISSUED TO EXTEND COVERAGE IN THE ABOVE NAMED COMPANY PER EXPIRING POLICY #:	

COVERAGES		LIMITS		
TYPE OF INSURANCE	COVERAGE/FORMS	DEDUCTIBLE	COINS %	AMOUNT
PROPERTY CAUSES OF LOSS BASIC <input type="checkbox"/> BROAD <input type="checkbox"/> SPEC <input type="checkbox"/>				
GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS MADE <input type="checkbox"/> OCCUR <input checked="" type="checkbox"/> X OCP	Owners & Contractors Protective Liability RETRO DATE FOR CLAIMS MADE:	EACH OCCURRENCE		\$ 1,000,000
		DAMAGE TO RENTED PREMISES		\$
		MED EXP (Any one person)		\$
		PERSONAL & ADV INJURY		\$
		GENERAL AGGREGATE		\$ 1,000,000
		PRODUCTS - COMP/OP AGG		\$
AUTOMOBILE LIABILITY ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/>		COMBINED SINGLE LIMIT		\$
		BODILY INJURY (Per person)		\$
		BODILY INJURY (Per accident)		\$
		PROPERTY DAMAGE		\$
		MEDICAL PAYMENTS		\$
		PERSONAL INJURY PROT		\$
		UNINSURED MOTORIST		\$
AUTO PHYSICAL DAMAGE DEDUCTIBLE COLLISION: <input type="checkbox"/> OTHER THAN COL: <input type="checkbox"/>	ALL VEHICLES <input type="checkbox"/> SCHEDULED VEHICLES <input type="checkbox"/>	ACTUAL CASH VALUE		\$
		STATED AMOUNT		\$
		OTHER		\$
GARAGE LIABILITY ANY AUTO <input type="checkbox"/>		AUTO ONLY - EA ACCIDENT		\$
		OTHER THAN AUTO ONLY:		\$
		EACH ACCIDENT		\$
		AGGREGATE		\$
EXCESS LIABILITY UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM <input type="checkbox"/>	RETRO DATE FOR CLAIMS MADE:	EACH OCCURRENCE		\$
		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		\$

NAME & ADDRESS		MORTGAGEE	ADDITIONAL INSURED
Contractors Name SomeStreet AnyCity State Zip		LOSS PAYEE	<input checked="" type="checkbox"/> Contractor
		LOAN #	
		AUTHORIZED REPRESENTATIVE <i>Michael G. Zerwas</i>	

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 Obligor 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
1.5	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	5
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	7
1.17	FINAL CLEANUP, GRADING, TOP SOIL AND SEEDING	7
1.18	EXISTING STRUCTURES AND UTILITIES	8
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1.20	PUMPING, BAILING AND DRAINING	9
1.21	SHEETING, SHORING AND BRACING	9
1.22	DISPOSAL OF EXCAVATED MATERIAL	9
1.23	DISPOSAL OF WASTE MATERIALS	9
1.24	TUNNELING	10
1.25	COMPRESSED AIR	10
1.26	EXPLOSIVES	10
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	11
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 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.

1.5 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.

1.6 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.

1.7 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".

1.8 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.

1.9 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.

1.10 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.

1.11 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.

1.12 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.

1.13 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.

1.14 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.

1.15 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.

1.16 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.

1.17 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.

1.18 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.

1.19 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.

1.20 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.

1.21 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.

1.22 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.

1.23 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.

1.24 COMPRESSED AIR

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

1.25 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.

1.26 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.

1.27 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.

1.28 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.

1.29 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.

1.30 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.

1.31 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. Paid for as: Dust Palliative, Applied - Ton

1.32 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 rights 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 01012
PROGRESS CLAUSE**

PROGRESS SCHEDULE:

Start work on the date approved by the Engineer, which cannot be prior to receipt of formal notice of award and approval of the CPM network by the City. Construction cannot begin until **May 1, 2023**.

For the purposes of this Progress Clause, Calendar Day(s) shall be defined as 7:00 A.M. to 6:00 P.M., Monday through Saturday, unless otherwise authorized by the City. Should an emergency arise which would require working beyond the hours mentioned, the Contractor shall contact the Public Services Department for approval for work beyond the permitted hours.

COMPLETION DATES:

All Areas

All work, other than the delayed acceptance requirements for Turf Establishment, shall be sufficiently complete and in suitable condition to be designated “Approved for Traffic” and shall be Opened to Traffic as directed by the Engineer, on or before **June 30, 2023**. The “Approved for Traffic” condition shall be as defined in section 107.21, Approved for Traffic, of the MDOT 2020 Standard Specifications for Construction.

Entire Project

The entire project including all punch list items, all traffic control devices must be picked up and the site shall be made acceptable (approved by the Owner) and acceptance for Turf Establishment shall be completed on or before **July 14, 2023**.

Failure on the part of the Contractor to meet each of the above milestones by the date specified shall result in the assessment of Liquidated Damages against the Contractor as provided in Section 108.10, Liquidated Damages, of the MDOT 2020 Standard Specifications for Construction.

GENERAL PROGRESS SCHEDULE PROVISIONS:

No extension of time will be granted for labor disputes unless it can be shown that such disputes are industry wide.

Any extra costs incurred by the Contractor due to night work, insufficient manpower, and equipment necessary to maintain the schedule and/or meet any open to traffic date or the completion date, and any overtime utilized will not be paid separately and are deemed to be included in the contractors unit bid prices.

No extension of time will be granted for delays in delivery of critical materials unless the delay can be shown to be industry wide and the delay affects a critical item of work.

The low bidder for the work covered by this Proposal will be required to submit a tabulated detailed Progress Schedule, as well as a CPM network (arrow diagram). Submission of the Progress Schedule

shall be no later than the preconstruction meeting. Submission of the CPM network shall be a maximum of five (5) calendar days after the preconstruction meeting.

It should be anticipated that the Township may require up to two (2) calendar days for review of the proposed schedule after the preconstruction meeting. It should also be anticipated that the Township may require up to five (5) calendar days for review of the proposed CPM Network after its initial submittal.

CONTRACTOR'S PROGRESS SCHEDULE:

The Progress Schedule shall include, as a minimum, the controlling items for the completion of the project and the planned dates (or days for workday project) that these work items will be controlling operations. When specified in the bidding Proposal, the date the project is to be opened to traffic, as well as the final project completion date specified in the bidding Proposal shall be included in the Progress Schedule. The start date of any subsequent controlling item must follow the completion date of the preceding one even though operations may be identified as concurrent. Overlapping of controlling items shall not be allowed. If the Bidding Proposal specified other controlling dates, these shall also be included in the Progress Schedule.

Failure on the part of the Contractor to carry out the provisions of the progress schedule, as established, may be considered sufficient cause to prevent bidding future projects until a satisfactory rate of progress is again established.

CPM NETWORK:

1. CPM Networks shall be done by Area and street in sufficient detail so that sequencing of his work is readily apparent.
2. CPM Networks shall be submitted using the standard activity-on-node, or PERT, diagramming method to describe all work activities to be accomplished and the interdependencies. A sufficient number of activities (tasks) will be required with sufficient detail that the controlling operation (critical path) may be identified.

The work activities shall also be correlated on the diagram to the proposed sequence of construction operations included in the staging for the project. Notation on each activity shall include a brief work description and activity time duration.

3. The network logic diagram shall show the sequence and interdependence of all activities required for complete performance of all items of work under this contract including shop drawing submittal, approvals, fabrication, and delivery activities.
4. The activities are to be described so that the work is readily identifiable and the progress on each activity can be readily measured. For each activity, the Contractor shall identify the trade or subcontractor performing the work, the duration of the activity in workdays, and the location of the work.
5. The Contractor shall also provide the following information: work days per week, holidays, number of shifts per day, number of hours per shift, and major equipment to be used.

The low bidder(s) for the work covered by this Proposal will be required to meet with Township representatives to work out a detailed Progress Schedule. The schedule for this meeting will be set after the bidder is determined. The named subcontractor(s) for Designated and/or Specialty items, as shown in the Proposal, is recommended to be at the scheduled meeting if such items materially affect the work schedule. The local agency or Project Engineer will arrange the time and place for the meeting.

END OF SECTION

SECTION 01020

SUPPLEMENTAL PROJECT NOTES

1. GENERAL

These supplemental project notes form a part of the Specifications and Contract Documents for the 2023 Sidewalk Improvement Program in the City of Wixom with the requirements herein specified supplementing and/or superseding those contained in the balance of the Specifications and Contract documents. **Note that this section of the specifications will take precedence over all other specifications in this book.** Construction specifications not addressed herein or in the balance of the specifications shall be in accordance with the MDOT 2020 Standard Specifications for Construction.

2. EXISTING CONDITIONS

Each bidder shall personally visit the site of the projects and pay particular attention to the existing conditions and the salient features of the projects in order to assure himself of the amount of equipment, materials, and work required to satisfy the requirements of the projects.

3. EXISTING UTILITY LOCATIONS

The Contractor is notified that various existing overhead and underground utilities and structures will exist within the areas of work on this project. The Contractor shall be responsible for notification to the Miss Dig Damage Prevention Program prior to commencing work.

4. HOURS OF OPERATION

The City of Wixom permits construction between the hours of 7:00 A.M. to 6:00 P.M., Monday through Saturday, unless otherwise authorized by the City. Should an emergency arise which would require working beyond the hours mentioned, the Contractor shall contact the Public Services Department for approval for work beyond the permitted hours.

5. MAINTAINING SOLID WASTE (RUBBISH) SERVICES

Rubbish collection shall not be interfered with by the Contractor's operations. If access to certain areas is blocked by the Contractor's operations, he shall transport the rubbish himself to a location accessible to the collection crews, incidental to the project.

6. COOPERATION WITH OTHER CONTRACTORS

The Contractor shall make every effort to cooperate and coordinate with all other contractors working in the area at the time of construction.

7. PAVEMENT GAPPING

All pavement gapping required to maintain access on this project shall be considered incidental to the items of construction.

8. MAINTENANCE AGGREGATE

The Contractor shall use 21AA Aggregate for the purpose of maintaining traffic and access to all areas that would otherwise be accessible if construction were not occurring. Paid for as Maintenance Gravel – Ton. Use of Maintenance Gravel must be approved by Engineer in order to be paid.

9. WATER STOP BOX AND GAS VALVE ADJUSTMENTS

All water stop box and gas valve box adjustments necessary shall be incidental to this project. The Contractor shall be responsible for adjusting water stop boxes. The gas company shall be responsible for adjusting gas valves.

10. CLEANING OF PAVEMENT

The cleaning of pavement, as required, shall be included in the unit prices bid for the various items of work. It is the City's intent to minimize the inconvenience of dust and debris created by construction of this project. In an effort to comply with City's goals, the Contractor shall be obligated to clean the pavement within four (4) hours of written notification by the Owner. Should the Contractor fail to respond within four hour requirement, the City reserves the right to retain an outside contractor at a minimum three hour time at a minimum \$80.00 per hour rate to provide the services of pavement cleaning. All costs incurred by the Contractor's failure to respond to the notification shall be deducted from any payments due the Contractor.

11. LAWN RESTORATION

All grass restoration work shall be as specified in the Contract Specifications. Failure of the contractor to perform grass restoration work in a prompt and timely fashion will result in the suspension of all other contract operations until the grass restoration has been completed in a satisfactory manner as directed by the Engineer. Payment for all restoration work shall be included in the unit price of Turf Establishment, Special - Syd. Note that the existing irrigation systems may not be used for the purpose of watering restored areas without written consent from the Owner.

12. CLEANING OF STRUCTURES

The Contractor shall protect catch basins and manholes. All materials that enter the structures as a result of the Contractor's operations shall be removed immediately. Prior to final acceptance of this project, all structures within the area disturbed by this construction thoroughly cleaned of all debris that has accumulated as a result of the contractor's operations and that was present before the start of construction. This will be incidental to the cost of the project.

13. EXPOSING EXISTING UTILITIES

Contractor shall verify the depth of existing utilities throughout the project length in order to permit the Engineer to adjust grades to avoid conflicts with existing utilities. Should the Contractor fail to expose the existing utilities prior to construction, the Contractor shall be responsible for removing and reinstalling any proposed utility with which a conflict arises from his failure to perform this item.

14. TEMPORARY MAINTENANCE OF DRAINAGE

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During construction of this project, it will be necessary to maintain temporary drainage. All costs incurred in providing a temporary ditch and temporary driveway culverts as indicated on the drawings and/or as required by the resident engineer shall be considered as incidental to this project. The Contractor may be permitted to use salvaged culverts for temporary maintenance of drainage as long as the culverts are not crushed, a minimum of 12 inch diameter, and of sufficient length to fit the location in which they are being installed.

15. ENCASEMENTS AT UTILITY CROSSINGS

Where a proposed utility crosses an existing utility with less than 18" of clearance, a concrete encasement shall be provided one foot beyond the pipes each way with 3,000 psi concrete. All costs incurred in providing the aforementioned encasements shall be included within the unit prices bid for the proposed utility causing the conflict.

16. CONSTRUCTION STAGING

The Contractor may submit an alternate construction-staging plan for the Owner's review and approval. It is critical that any staging of the work establishes an orderly time table for the phased installation of the project while maintaining vehicular and pedestrian traffic. Communication with the City and the Police Department is extremely important with this project. The Contractor (and subcontractors) shall coordinate all construction activities with the Engineer so that adequate notice (24 hour minimum) may be provided to the effected property owners.

17. MAINTAINING TRAFFIC

The items for maintaining include barricades, plastic drums, construction signing and flag control necessary to maintain street traffic, truck traffic, and driveway access within the construction influence area for all areas in each division of work. See Section 02550 Maintaining Traffic for additional maintaining traffic details and requirements. Methods shall conform to the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

18. DISPOSAL OF EXCAVATED MATERIALS

All materials removed, with the exception of clean fill dirt where required for fill areas to complete the required work, shall be disposed of off-site. No exceptions will be considered, and all costs associated with transporting, disposing, etc., shall be considered as included in the appropriate bid items. This includes any excess material generated from pavement removal activities. When no specific bid item exists, the costs associated with compliance of this provision shall be considered incidental to the project.

19. DEWATERING

All dewatering necessary for this project (i.e., deep wells, well points, pumps, stone, etc.) is to be provided by the Contractor at his own expense. All costs associated with dewatering shall be incidental to the items of construction.

20. DUST CONTROL

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 or Engineer. The use of water by the Contractor shall be included in the bid item MAINTAINING TRAFFIC. When calcium

chloride is requested by the engineer, a concentration of 4.4 lbs of calcium chloride per gallon of water shall be used. The cost of the stock chemical shall be included in the unit price for DUST PALLIATIVE, APPLIED (ton).

21. MAIL SERVICE

The Contractor shall allow uninterrupted delivery of the mail to businesses. Access shall be maintained to all mailboxes, FedEx, UPS, USPS, and other third party/public/private mail delivery boxes in all project areas for the entire duration of the project. Any temporary removal and replacement of individual mailboxes will be included in MAINTAINING TRAFFIC.

22. M.I.O.S.H.A. STANDARDS

All work performed by the Contractor must conform to the current M.I.O.S.H.A. standards and requirements including confined space entry. If required by the City, the Contractor will be required to sign a waiver stating that he has read, understood and will comply with M.I.O.S.H.A. requirements.

23. RESIDENT COMPLAINTS

The Contractor will be required to immediately address any complaints or concerns. Should the Contractor not be able to answer the resident, they must be directed to the Project Engineer.

24. ADDITIONAL BIDS - QUANTITY INCREASE/DECREASE

Additional quotations may be requested during the term of this Contract, separately from the original bid and are subject to the same terms and conditions of the original bid. There will be no adjustment in the contract unit prices regardless of the percentage increase or decrease above or below the contract quantity for any item of work.

END OF SECTION

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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

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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.

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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 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.

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- 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.

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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

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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.

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- 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 Contractors 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 Engineers 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

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SECTION 02140

DEWATERING

PART 1 GENERAL

1.1 GENERAL

- A. All dewatering, well pointing, pumping, bailing and cleaning shall be performed that is necessary to complete the work as specified and as shown on the Drawings under this Contract.
- B. 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.
- C. The Contractor shall draw his own conclusions as to soil and groundwater 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.
- D. 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.
- E. The Contractor shall be solely responsible for evaluating the suitability of his dewatering methods with the Plans, Specifications and Soil Information provided by the Owner for bidding purposes. The Contractor shall also obtain County records as to the depth of wells providing water to the community or private individuals within the area affected by the dewatering operation if this information is not included in the Contract Plans or Specifications. The Contractor shall be prepared to supply potable water within forty-eight (48) hours to all parties affected by the dewatering operations and shall continue supplying water for a period of thirty (30) days after ceasing dewatering operations. All costs associated with the supplying of water shall be incidental to the work as bid.

If the affected parties remain without water thirty (30) days after ceasing dewatering operations, the supplying of water and resolution of the problem will be addressed by the Owner of this project.
- F. 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.
- G. 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.

- H. The requirements of any relevant Soil Erosion Control permit or Wetlands permit shall be adhered to at all times.

1.2 RELATED SECTIONS

- A. Section 01000 - General Specifications
- B. Section 01900 - Soil Conditions and Boring Logs
- C. Section 02220 - Soil Erosion Control

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 REMOVAL OF WATER

- A. Ample means and devices shall be provided and maintained at all times during the life of this Contract to remove and properly dispose of all ground water and drainage water within, around, and entering the excavated area. The excavation and the structures within shall be kept dry until the work is completed, or as approved by the Owner.
- B. The water level within and below work areas shall be so maintained that there is no unbalanced upward pressure on the bottom of structures, sewers, or open excavations during the construction period. The Contractor shall provide means within the excavation to enable the Owner to monitor the elevation of the artesian groundwater, if present. The level of the artesian groundwater shall be maintained by the Contractor's methods to prevent the possibility of upward movement of the structure or earth within the excavation area. Water levels shall be maintained to meet the approval of the Owner.
- C. In addition, water that may occur during excavation for base slabs, pipe trenches, etc., shall be channeled to accumulate in certain low points and disposed of through a filtering device before entering into sewers, streams, or rivers in accordance with Section 02220 – Soil Erosion Control, the Soil Erosion Control Permit, and as specified by the MDNR.
- D. The Contractor shall determine the extent of dewatering required to complete the work, and shall include all dewatering costs as incidental to the work as bid, unless provided otherwise in the Proposal.
- E. Dewatering as determined necessary by the Contractor to maintain work areas dry shall be continuous until the perimeter drain system, when required, is fully operational. The Contractor's dewatering equipment shall remain in place an additional thirty (30) days to verify operation of the perimeter drain system.

All excavation dewatering shall be routed as necessary so as not to impede construction. In any event, all pumping and drainage shall be done without damage to any other property,

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public or private, and without interference with the rights of the public or private property owners. The Contractor shall review soil information provided under Section 01900 - Soil Conditions and Boring Logs. This information may be used as an aid to the Contractor in determining the screen material necessary for well points or relief wells to prevent the removal of soil fines with the water removed. All pumping and drainage shall comply with Section 02220 - Soil Erosion Control.

- F. The Contractor shall receive no extra compensation for providing, maintaining or operating any dewatering or drainage facilities. The removal or stoppage of artesian water which, if any, might occur in the work shall be deemed to be covered by this Section of the Specifications unless provided for otherwise in the Proposal.
- G. On completion of this project the Contractor shall fill all dewatering depressions and withdraw all dewatering facilities and drainage devices and restore the area to an acceptable condition, as approved by the Owner.

END OF SECTION

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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 01900 - Soil Conditions and Boring Logs
- D. Section 02140 - Dewatering
- E. 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.

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- 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.

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- 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 recompact.

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.

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- 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.

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- 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.

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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.

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- 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.

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

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SECTION 02211

ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of topsoil and subsoil.
- B. Cutting, grading, filling, rough contouring, and compacting, the site to meet the requirements shown on the Contract Drawings and as specified in related sections.

1.2 RELATED SECTIONS

- A. Section 01400 – Quality Control.
- B. Section 02200 – Earthwork.
- C. Section 02220 – Soil Erosion Control.

1.3 REFERENCES

- A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10 lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- D. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil: Type - Existing Removed Material as specified in Section 02200.
- B. Subsoil Type: Excavated and re-used material, graded, free of lumps larger than 3 inches, rocks larger than 2 inches and debris conforming to ASTM D2487 Group Symbol OL.

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- C. Subsoil Type S2: Imported material, graded, free of lumps larger than 3 inches, rocks larger than 2 inches and debris conforming to ASTM D2487 Group Symbol OL, as required to complete fill operation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions.
- B. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Protect all utilities from damage.
- D. Notify utility company to remove or relocate utilities as required.
- E. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- F. Protect bench marks, survey control points, structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 SOIL EXCAVATION

- A. Excavate topsoil and subsoil from areas to be excavated for installation of structures and utilities and areas to be further re-landscaped, or re-graded as indicated on the Contract Drawings. Depth of subsoil removal shall be as called for on the Contract Drawings and as specified in the special provision for “Turf Establishment, Special”.
- B. Do not excavate and process wet material to obtain optimum moisture content.
- C. When excavating through roots, perform work by hand and cut roots with sharp axe.
- D. Stockpile in area designated on remote site to depth not exceeding 10 feet and protect from erosion. Segregate topsoil from sub-soil and store separately. Protect stockpiles from erosion from water and wind.
- E. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.
- F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

FILLING

- A. Install Work in accordance with State of Michigan MDOT standards and as called for in Sections 02200 – Earthwork and as called for on the Contract Drawings.

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- B. Fill areas to contours and elevations with unfrozen materials.
- C. Place fill material on continuous layers and compact as called for in Sections 02200, and as called for on the Contract Drawings.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum 2 inches in 10 ft unless noted otherwise.
- F. Make grade changes gradual. Blend slope into level areas.
- G. Remove surplus fill materials from site.

3.4 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation or as called for in Section 02200.

3.5 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Control: Field inspection and testing.
- B. Testing: In accordance with ASTM D1556, ASTM D1557, ASTM D698, AASHTO T180, ASTM D2167, ASTM D2922, and ASTM D3017.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- D. Frequency of Tests: To be determined by Owner's testing consultant.

3.6 SCHEDULES

- A. Compaction and depth of each lift shall be as referred to in Sections 02200 and 02970, and as called out hereinafter, or as called for on the Contract Drawings.
- B. Structural Fill:
 - 1. Fill Type-Clay: Maximum 12 inches compacted depth for each lift.
 - 2. Compact to minimum 95 percent of maximum density.
- C. Pervious Structural Fill:
 - 1. Fill Type-MDOT Class II Maximum 12 inches compacted depth for each lift.
 - 2. Compact to minimum 95 percent of maximum density.

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 02140 - Dewatering.

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.

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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.

1.3 RELATED SECTIONS

- A. Section 02200 – Earthwork
- B. Section 02211 - Rough Grading
- C. SP_Turf Establishment

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 from the County 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 the special provision for Turf Establishment 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 or Sudan Grass or Rye or Perennial Ryegrass or Wheat	25 lbs/acre 35 lbs/acre 25 lbs/acre 25 lbs/acre 2.5 bus/acre	April 1 to Aug. 15 June & July Aug. 1 to Oct. 15 Sep. 20 to Oct. 15
Fertilizer: 12-12-12 Commercial	600 lbs/acre	Seeding Season
Mulch: Sm. grain Straw Hay	2 tons/acre	All Year
Spray Coating: Liquid Asphalt RC 1, 2, or 3 MC 2 or 3	0.10 gal/s.y.	All Year
Asphalt Emulsion: RC 1 or 2 MC 2	0.04 gal/s.y.	Spring & Fall
Mulch: Kraft Paper	Cover Area	All Year

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<u>Material</u>	<u>Amount</u>	<u>Season</u>
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 Section 02200 and the special provision for Turf Establishment 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 seedings 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 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

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SECTION 02520

CONCRETE PAVING

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PART 1 GENERAL

1.1 GENERAL PROVISIONS

A. Intent of the Plans, Specifications and Contract:

1. The intent of the plans, specifications and contract is to provide for the completion of the work in compliance with the details, as shown thereon and as described herein.
2. The Contractor shall furnish all labor, materials, equipment, tools, transportation and necessary supplies, and shall perform all operations required to complete the work in accordance with the specifications, and the lines, grades and cross sections provided for on the plans or established by the Engineer.

B. Specifications by Reference:

1. Whenever reference is made to specifications other than those contained herein, said specifications shall apply and be as binding as if fully repeated herein.
2. Any work not covered in the specifications shall be accomplished in accordance with the current standards and specifications of the Michigan Department of Transportation.

C. Increased or Decreased Quantities:

1. The Engineer reserves and shall have the right under the contract to make such changes, from time to time, in the plans and in the quantities of the work, as may be necessary or desirable to insure the completion of the work in the most satisfactory manner.

D. Construction Schedule:

1. The bidder will be required to fill out a project completion schedule, if provided in the proposal.
2. Otherwise the successful bidder, before the award of the contract, will be required to submit and outline of his proposed order of work and to indicate dates for the completion of the major items of the work.
3. This schedule shall become a part of the contract.

E. Construction Stakes:

1. The general location, alignment, elevation and grade of the work will be determined by the Engineer who will set such stakes as are necessary to properly mark these elements.
2. The Contractor shall assume full responsibility for detail dimensions and elevations measured from the lines, grades, and elevations so established.
3. The Engineer may require the Contractor, at the Contractor's expense, to provide such devices as may be necessary to facilitate laying out, inspecting and constructing the work.
4. The Contractor shall exercise proper care in the preservation of all stakes set for his use or for the use of the Engineer, and if such stakes are injured, lost or removed by the Contractor's operation, the cost of resetting may be charged to the Contractor.
5. Land monuments shall not be moved or otherwise disturbed except as directed by the Engineer.
6. The Contractor shall bear all expense in resetting land, monuments that have been disturbed without authorization from the Engineer.
7. All government, plat, and street intersection monuments shall be preserved.
8. When they occur within the proposed pavement area, they shall be enclosed in standard monument boxes as part of the pavement construction.

F. Cleanness of the Work:

1. The Contractor shall at all times keep the street or highway and any public or private premises temporarily occupied by him for purposes of work under this contract free from accumulations of waste material or rubbish caused by his employees or work.
2. This requirement shall also apply to any areas in the vicinity of the work which are affected by the Contractor's construction or hauling operations.
3. Trucks hauling excavated materials, cement, sand, stone or other loose materials from or to the site, shall be tight so that no spillage will occur on adjacent streets. Before trucks start away from the site, their loads shall be carefully trimmed, by hand, if necessary.
4. Power driven sweeping equipment shall be available to adequately clean daily, or as often as necessary in the opinion of the Engineer, all areas which become a nuisance and a source of complaint due to the operations of the Contractor, subcontractor, or materials suppliers to the project.
5. A rotary sweeper (or equivalent) may be used when, in the opinion of the Engineer, the conditions inherent with using this equipment are not objectionable insofar as traffic and abutting developed property are concerned.
6. When the use of a rotary sweeper is not feasible in the opinion of the Engineer due to its inadequacy in keeping dust laid or for any other objectionable feature, a power driven pickup type sweeper (or equivalent) will be required to be furnished by the Contractor for use on the project.

7. If the Contractor shall fail to keep the above noted areas cleaned of dust or debris resulting from his operations, and thereby shall create any public nuisance, he shall be so notified by the Engineer. If within 2 hours after receipt of such notice the Contractor shall fail to clean such areas satisfactorily, the Engineer may have the Owner perform the work and all costs of such cleaning shall be paid for by the Contractor.

G. Protection and Restoration of Property:

1. The contractor shall restore at his own expense, any public or private property damaged or injured in consequence of any act or omission on his part or on the part of his employees or agents, to a condition equal or better than the existing before such injury or damage was done.
2. If the Contractor neglects to restore or make good such damage or injure, the Owner may upon 48 hours notice proceed to restore or make good such damage or injury and to order the cost thereof deducted from any monies that are due or may become due the Contractor for his work.
3. When it is possible for construction operations to endanger any railroad facility, public or private utility, conduit, or structure, the Contractor shall notify the railroad or utility owner of this possibility, and the Contractor shall take such steps as may be required to safeguard and support such railroad facilities, utilities, conduits, or structures, in full conformance with all of the provisions of the State of Michigan, Public Act 543 of 1974.
4. Where it is the policy of any utility owner to make its own repairs to damaged conduit or other structures, the Contractor shall cooperate to the fullest extent with the utility and he shall see that his operations interfere as little as possible with these operations, and the Contractor shall assume the cost of any change therefore.
5. In cases where existing sewers, drains, and water service connections are encountered, the Contractor shall perform his operations in such a manner that service will be uninterrupted, and the cost thereof shall be at the Contractor's expense, unless otherwise provided.

H. Limits of Operations:

1. The Contractor shall begin work and operate at such points as the Engineer may deem necessary and shall thereafter prosecute the work in such order as may be prescribed by the Engineer.
2. In case of a dispute arising between two or more Contractors or others as to the respective rights of each under these specifications, the Engineer shall determine the matters at issue and shall define the respective rights of the various interests involved in order to secure the completion of all parts of the work in general harmony and with satisfactory results, and his decision shall be final and binding on all parties concerned and shall not in any way be cause for claim for extra compensation by any of the parties.

1.2 SUBGRADE PREPARATION

- A. With reference to grading operations, the bottom of the excavation or top of the fill upon which the pavement structure is to be placed shall be known as the subgrade and shall conform to the lines, grade, and cross-sections shown on the plans.

- B. When and where required by the Engineer, the subgrade shall be proof-rolled with a 20 ton roller.
 - 1. All soft and yielding material and other portions of the subgrade that will not compact readily when rolled or tamped shall be removed to a depth determined by the Engineer and replaced with an engineered granular material.
 - 2. Proof-rolling shall be accomplished as incidental construction.
 - 3. Payment for undercutting and backfill shall include disposal of surplus excavated material.
- C. The subgrade shall be brought to a firm and unyielding condition, uniformly compacted to at least 95% of maximum density as determined by AASHTO T-180 Modified Proctor Moisture Density Test. It shall be compacted at optimum moisture content, +/- 2%.
- D. All utility, sewer, edge drain trenches and structure excavations shall be backfilled as shown on the plans and/or appropriate details and specifications.
- E. Where shown on the plans or specified, a subbase consisting of a layer of specified material of designed thickness shall be placed on the subgrade as a part of the pavement structure.
- F. The surface of the subgrade shall be accurately trimmed to within 0.1 foot above or below the established grade and shaped to provide drainage.
 - 1. The subbase material shall be evenly spread and compacted to at least 95% of maximum density as determined by AASHTO T-99.
 - 2. Should the subgrade at any time prior or during the placing of subbase become soft or unstable to the extent that rutting occurs in the subgrade or to the extent that the subgrade material is forced up into the subbase material, the operation of hauling and placing subbase shall be immediately discontinued.
 - 3. Where subgrade material has become mixed with the subbase material, the mixed material shall be removed and disposed of.
 - 4. After the subgrade has been corrected as directed by the Engineer, new subbase material shall be placed and compacted as specified above.
- G. Subbase shall not be placed on frozen subgrade.
- H. Prior to placing the concrete, the subbase shall be tested for conformity with the cross-section shown on the plans.
 - 1. If necessary, material shall be removed or added, as required, to bring all portions of the subbase to the correct elevation.
 - 2. It shall then be thoroughly compacted and again tested.
 - 3. Concrete shall not be placed on any portion of the subbase which has not been tested for correct elevation.
 - 4. The subbase should also be cleared on any loose material which may have fallen upon it.
- I. When the slip-form method is used, the areas along which the paving equipment will travel shall be cut to the accuracy required for side forms.

PART 2 PRODUCTS

2.1 MATERIALS.

A. Concrete

1. Portland cement, aggregates and water shall be furnished only from sources of supply approved by the Engineer before shipments are started.
2. The basis of approval of such sources shall be the ability to produce materials of the quality and in the quantity required.
3. Mill tests for Portland cement will be acceptable.

B. Aggregate shall be so handled that the moisture content is reasonably uniform and care shall be taken to prevent segregation of aggregates stockpiled prior to use.

1. Material which has segregated to such an extent that it will no longer pass the specifications for grading shall be recombined so that it will pass the grading specification before it is used in concrete.
2. No aggregates shall be used which have become mixed, while in storage, with foreign material.
3. Frozen aggregates or aggregates containing frozen lumps shall be thawed before use.

C. Fine Aggregate

1. Fine aggregate shall consist of natural sand subject to the approval of the Engineer.
2. It shall be composed of clean, hard, strong, durable, uncoated grains and shall conform to current Standard Specifications 2NS for fine aggregate for Portland cement concrete pavement of the Michigan Department of Transportation (M.D.O.T.).

D. Coarse Aggregate

1. Coarse aggregate shall be crushed stone, rock, gravel or blast furnace slag weighing not less than 75 pounds per cubic foot in accordance with AST C-29, and shall be composed of hard, sound, uncoated pieces conforming to Michigan Department of Transportation designation 6A.

E. Cement

1. Cement shall be Air-Entraining Portland Cement, Type 1A conforming to ASTM C150.
2. Air-Entraining Portland Blast-Furnace Slag Cement, Type IS-A conforming to ASTM C595 or High-Early-Strength Air-Entraining Portland Cement, Type IIIA conforming to ASTM C150.
3. The Contractor shall provide suitable means for storing and protecting the cement against dampness.
4. Cement that for any reason has become partially set or that contains lumps or caked cement shall be rejected.

F. Water

1. The water used in mixing or curing concrete shall be the Owner's water unless written permission is given to use an alternate source.
2. Water shall be clean, clear, and reasonably free of oil, salt, acid, alkali, sugar, vegetable, organic or other matter or substance injurious to the finished product.
3. If the water is of questionable quality, it shall be tested in accordance with AASHTO T-26.

4. The Contractor shall obtain and pay for all necessary permits and testing and shall pay for all water used.
- G. Admixtures
1. Air-entraining agents shall conform to the requirements of ADTM C-260.
 2. Air-entraining agents shall have proven compatibility with all local concrete materials, including cement, and shall be capable of providing in the concrete the required air contents and an air-void system known to produce durable, scale-resistance concrete.
 3. Water-reducing admixtures shall conform to the requirements of ASTM C-494, Type A.
 4. Water-reducing retarding admixtures shall be used only when specified or authorized, in which case they shall conform to the requirements of ASTM C-494, Type D.
 5. When conditions warrant, the Engineer may allow or require the use of an accelerator conforming to the requirements of ASTM C-494 for chemical admixtures or ASTM D-98 for calcium chloride.
- H. Tiebars:
1. Tiebars shall be deformed, and shall conform to the requirements of ASTM Specifications A-15, A-16, or A-160.
 2. Tiebars shall be free from excessive rust, scale, or other substances which prevent the bonding of the concrete to the reinforcement.
- I. Hook Bolts:
1. Joint dowel hook bolts shall conform to the details and design shown on the plans.
 2. The hook bolts shall be 5/8" in diameter and shall have a minimum tensile strength of 16,000 pounds.
 3. The coupling or the shank of the hook bolt shall provide a positive stop to prevent the shank of the hook bolt from being treaded beyond the center of the coupling.
 4. Where pavement is to be widened and hook bolts are not usable or where not installed in the existing pavement, expansion hook bolts, approved by the Engineer, shall be installed as shown on the plans.
 5. The installation shall conform to the manufacturer's recommendation for the specific expansion anchor used.
- J. Preformed Joint Fillers:
1. Fiber expansion joint filler shall conform to the requirements of ASTM, D-1751, except that the absorption requirements shall not apply to material 1/4" in thickness.
 2. Premolded parting strips shall consist of a 1/4" asphalt hardboard meeting the requirements of ASTM D-994.
 3. They shall be of such character that they will not be permanently deformed by ordinary handling during hot weather or become hard and brittle in cold weather.
- K. Joint Sealing Compound:
1. Sealing material for filling pavement joints shall be hot poured rubber asphalt joint sealing compound conforming to Federal Specifications SS-S-164.
- L. Materials For Curing Concrete:
1. Membrane curing compounds for exposed concrete shall be the white-pigmented type conforming to the current requirement of the Michigan Department of Transportation specifications at the rate of one gallon per 200 square feet of surface.

2. Other materials may be used in accordance with the current Michigan Department of Transportation specifications for Concrete Curing Materials.
3. Transparent membrane curing compound conforming to requirement of ASTM C-309, Type 1-D, Class B vehicle shall be used for curing base course concrete.

2.2 EQUIPMENT:

- A. All equipment necessary for the proper preparation of the subgrade, batching, mixing, placing, finishing and curing of the concrete pavement shall be on the project in good working condition before the Contractor will be permitted to begin placing concrete.
 1. Throughout the construction of the project, the Contractor shall maintain the equipment in good working condition.
 2. The Contractor shall provide equipment of such capacity that the mixer will operate continuously or at a constant rate of production insofar as feasible.
 3. In the event that any piece of equipment does not have sufficient capacity to keep pace with the other operations, the Engineer may Limit the rate of production to prevent poor workmanship, overloading of equipment, or frequent delays.
 4. All self-propelled equipment in the paving train shall be equipped with approved guards for the protection of personnel. Form scrapers will be required on all screeding equipment.
 5. Any equipment operating entirely or partially on adjacent pavement shall be equipped with rubber-tired wheels.
 6. If the pavement is to be constructed by the slip-form method, the equipment requirements given herein shall be modified to achieve the required results without the use of fixed side form.
 7. Certain items of equipment in this section may be omitted by authorization of the Engineer when the size of the project does not warrant their use and when paving non-standard and variable widths.
- B. Forms:
 1. Forms shall be of such cross-section and strength and so secured as to resist the pressure of the concrete when placed and the impact and vibration of any equipment which they support, without springing or settlement.
 2. Unless special provision is made for use of wood, all side forms for this work shall be of metal of a depth at least equal to the edge thickness of the work prescribed, except as hereinafter specified for pavement with integral curb.
 3. The width of the base in direct bearing on the soil shall be not less than 0.75 of the form depth except that a width of less than 8" will not be permitted.
 4. The sections shall have a length of at least ten (10) feet, except on curves of less than one hundred fifty (150) foot radius, where other materials may be used as provided under "Flexible Forms."
 5. Forms which do not meet the required edge thickness of pavements having integral curb, may be increased in depth a maximum of 6 inches by the addition of continuous wooden planking rigidly connected to the metal form, whose base width is not less than 8 inches, with a minimum of 5 equally spaced bolts.
 6. The subgrade may be a maximum of one inch lower than the bottom of the built-up forms. The width of the wooden base shall be equal to or greater than the base width of the metal form, except that a nominal depth and width of less than 2 inches by 10 inches will not be permitted for the final plank in direct bearing on the soil.

7. The wooden planking shall be sound, capable of caring the loads imposed and shall be approved by the Engineer prior to fastening to the metal form.
8. When such built-up forms do not provide the necessary stability against movement along their vertical face, as determined by the Engineer, they shall be replaced with forms capable of sustaining the loads imposed thereon.
9. Each 10 foot section of form shall have at least three stake pockets.
10. The forms shall be straight, free from distortion, and shall show no vertical variation greater than 1/8 of an inch in 10 foot lengths from the true plane surface on the top of the form when tested with a 10 foot straightedge and shall show no lateral variation greater than 1/4 of an inch from the true plane surface on the vertical face of the form when tested with a 10 foot straightedge.
11. The supply of forms shall be sufficient to permit their remaining in place for twelve (12) hours after the concrete has been placed.

C. Flexible Forms:

1. Flexible steel or wood forms may be used only when specifically provided for on the plans or in special provisions with the exception that their use is herein approved for all curves having radii of less than one hundred fifty feet.
2. The top of the form when tested with a 10 foot straightedge shall show no lateral deflection of the edge thickness of the work prescribed.
3. Forms shall be held by stakes and securely braced at any point where necessary so that no movement will result from pressure of the concrete or the weight or thrust of machinery operating on the forms.

D. Batching Equipment:

1. The batching equipment shall conform to the currently published Standards of the Concrete Plant Manufacturers Bureau.
2. Cement shall be batched by weight in a separate batcher.
3. Fine and coarse aggregates shall be batched by weight in individual batchers or in cumulative batches.
4. Water may be batched by weight or volumetrically.
5. Liquid admixtures are to be batched by volume.
6. The Engineer will require the scales to be static tested for accuracy after each new set up by a qualified independent testing service.
 - a. The scales shall be maintained so they are accurate to 0.4 percent throughout the entire range of use.
 - b. The scale indicator shall be located in full view of the operator.
 - c. Weighing equipment shall be protected from air currents that affect the accuracy of weighing.

E. Mixing And Transporting Equipment:

1. Concrete may be mixed at the site of construction or at a central point or when approved, wholly or in part in truck mixers.
2. Each mixer shall be of an approved type and shall have attached prominently a manufacturer's plate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades.
3. The mixer shall have the capability to produce concrete of a uniform mixture in quantities necessary to allow effective and efficient paving operations.
4. Truck mixers shall be capable of discharging the concrete with a satisfactory degree of uniformity.

5. Truck mixers shall be equipped with counters indicating the number of revolutions at the manufacturer's recommended speed for mixing.
 6. Truck mixers used for mixing and hauling concrete and truck agitators used for hauling central mixed concrete shall conform to the requirements of AASHTO M157.
 7. Bodies of non-agitating hauling equipment for concrete shall be smooth, mortar-tight metal containers capable of discharging the concrete at a satisfactorily controlled rate without segregation. Covers shall be provided when needed for protection.
- F. Water Supply Equipment:
1. This equipment shall be adequate for the requirements of the work.
- G. Roller Or Compactor:
1. This equipment shall be a self-propelled steel wheeled or pneumatic-tired roller or a self-propelled vibrator vibratory compactor of adequate size to produce the required density.
- H. Finishing Equipment:
1. The Contractor shall provide a self-propelled mechanical finisher on standard width paving.
 1. It shall be designed to strike-off the pavement as well as to consolidate and compact it to the required cross section.
 2. The finishing equipment, either singly or in combination with strike-off and floating equipment shall provide a minimum of two (2) oscillating screeds.
 3. When pavement is placed by the slip-form method, the equipment shall spread, consolidate, screed, and mechanically float the freshly placed concrete in such a manner that only a minimum of hand finishing will be necessary.
 - a. The machine shall be equipped to vibrate the concrete for the full width and depth of the pavement.
 4. An approved hand-propelled vibratory screed shall be provided for use in areas where the pavement width will not permit the use of a finishing machine.
 - a. It shall consist of a steel-shod strike board having a gasoline engine capable of producing at least 5,000 vibrations per minute.
 - b. Other vibratory screeds may be approved by the Engineer.
 5. An approved steel-shod strike board with suitable handles for its operation shall be provided for use in areas where it is not feasible to use either a finishing machine or a vibratory screed.
- I. Lane Tie Bar Installer:
1. When not placed on approved chairs, lane tie bars shall be installed by use of an approved mechanical device.
- J. Vibrators:
1. When required, approved vibrators for consolidating concrete along the faces of forms and adjacent to joints shall be provided.
- K. Foot Bridge:
1. At least one movable bridge shall be provided for use in finishing the pavement, installing monument boxes, and crossing pavement.
 2. The bridge shall be of such design and construction that it will not come in contact with the concrete.

- L. Bulkheads:
 - 1. Bulkheads for end-of-pour joints shall be of adequate thickness, and so designated as to permit bars to extend through the joint.
 - 2. Slots shall be cut in the header board so it can be adjusted up or down as required.
- M. Concrete Saw:
 - 1. The concrete saw shall be self-propelled and shall be capable of cutting hardened concrete neatly to a depth as specified on the plans and/or details.
 - 2. The saw shall be equipped with a suitable guard.
- N. Joint Sealing Equipment:
 - 1. The heating kettle shall be of the indirect heating or the double boiler type.
 - 2. It shall have thermostatically controlled heat, a built-in agitator and thermometers to indicate the temperature of the sealing material.
 - 3. The pouring equipment shall force the sealing material to the bottom of the joint and completely fill it to the surface for the pavement.
- O. Membrane Sprayer:
 - 1. A pressure sprayer capable of applying a continuous uniform film will be required.
- P. Power Broom:
 - 1. A mechanical broom suitable for cleaning the pavement will be required.
 - 2. The Engineer may require the use of a power driven pickup type sweeper as previously stipulated under Paragraph F. of Section 1.01. General Provisions of this specification.
- Q. Other Equipment:
 - 1. The Contractor shall also furnish all other equipment, small tools and supplies which are necessary to the proper prosecution of the work.

2.3 PROPORTIONING AND MIXING

- A. The proportioning of concrete mixtures shall be based upon the water-cement ratio.
 - 1. The mix shall be governed by the net quantity of mixing water used per sack of cement which is necessary to obtain concrete of the desired strength and durability.
 - 2. Prior to placing concrete the Contractor shall submit a mix design which meets the approval of the Engineer.
- B. If it becomes impossible to obtain concrete of the desired plasticity and workability with the proportions originally designated, the proportions shall be adjusted as necessary to produce a mixture having the required qualities.
- C. Methods and equipment for adding air-entraining agent or other admixtures to the batch shall be approved by Engineer.
 - 1. All admixtures shall be measured into the mixer with an accuracy of plus or minus 3 percent.
- D. The cement and aggregates shall be fed into the mixer simultaneously and in such a manner that the period of flow for each is about the same.

1. Mixing time shall be measured from the time all materials except water are in the drum until the time when the discharge begins.
 2. The flow of water shall be uniform.
 3. A portion of the water shall enter in advance of the cement and aggregates, and all water shall be in the drum by the end of the first 15 seconds of the mixing period.
 4. The contents of the mixer drum shall be discharged or transferred before a succeeding batch is placed therein.
- E. The mixing time shall not be less than 50 seconds nor more than 90 seconds.
- F. The use of truck-mixed and/or ready mixed concrete supplied from commercial sources may be approved by the Engineer for certain projects when indicated elsewhere in the plans and specifications.
1. Each batch of concrete shall be mixed for the number of revolutions recommended by the manufacturer at the rate of rotation designated by the manufacturer as mixing speed.
 2. Additional mixing, if any, shall be at the speed designated as agitating speed.
 3. All materials including water shall be in the mixer drum before activating the revolution counter.
 4. The re-tempering of concrete in the mixer or transporting vehicle will not be permitted.

PART 3 EXECUTION

3.1 TRANSPORTING:

- A. The Contractor shall provide and use a ticket system for recording the transportation of concrete from the batching plant to the point of use.
1. The tickets shall be serially numbered and shall be of a form and size approved by the Engineer.
 2. Each ticket shall show the quantity of concrete, cement content and the time of charging the mixer.
- B. Tickets for truck mixed or shrink mixed concrete shall also bear the reading of the revolution counter at the time the mixer is charged, and at the time mixing is completed.
- C. The Engineer may require such additional information as may be necessary for proper control of the work.
1. The tickets accompanying loads of concrete shall be collected at the site of placement and given to the field observer upon his request.
- D. The interval of time between the charging of the mixer and the completion of the discharging of the concrete into the work shall not exceed that shown-below, except if unusual circumstances prevent the Contractor from completing the discharge within the specified period, the Engineer may permit the discharge to continue for an additional 15 minutes, in which case the location, reasons for, and duration of the delay shall be shown on the ticket.
- E. When it is anticipated that the time interval between charging and completion of discharge may exceed 30 minutes, the concrete shall be continuously agitated.

F. The maximum interval between charging of the mixer and placing of concrete shall be as follows:

G. TEMPERATURE OF CONCRETE

	<u>Type of Units</u>	<u>Below 60F</u>	<u>60F to 85F</u>	<u>Above 85F</u>
1.	Open Top Trucks	30 Min.	30 Min.	30 Min.
2.	Open Top Agitating Units	60 Min.	45 Min.	30 Min.
3.	Closed Top Agitating			
4.	Units & Truck Mixers	90 Min.	60 Min.	45 Min.

3.2 FORMING

A. When a slip form paver is used, references pertaining to forms and form riding equipment shall be deleted.

B. The subgrade under the forms shall be compacted and cut to grade so that the form when set will be uniformly supported for its entire length at the specified elevation.

1. All forms shall be cleaned and oiled each time they are used.

C. The Contractor shall check and correct alignment and grade elevations of the forms immediately before placing the concrete.

1. When any form has been disturbed or any grade has become unstable, the form shall be reset and rechecked.

D. When set to grade and staked in place, the maximum deviation of the top surface of any section from a straight line shall not exceed one eighth (1/8) inch.

1. The method of connection between sections shall be such that the joint formed shall be free from play or movement in any direction.

2. The use of bent, twisted or worn-out forms will not be permitted.

E. Forms shall not be removed from freshly placed concrete until it has set for 12 hours.

1. This period of time shall be increased or decreased when directed by the Engineer.

2. The forms shall be carefully removed so that no damage will be done to the pavement.

F. When the slip-form method is used, track paths shall be maintained to an accurate profile.

1. Any concrete deposited on the grade ahead of the paver that sloughs onto the track path shall be shoveled off.

2. When a control guide wire is used, it shall be carefully checked for line and grade and shall be taught and free from any obstructions with no measurable sag between supports.

3.3 PLACING

A. The concrete shall be mixed in quantities required for immediate use and shall be deposited on the subbase in such a manner as to require as little rehandling as possible.

1. Placing shall be continuous between transverse joints without the use of intermediate bulkheads.

2. Necessary hand spreading shall be done with shovels, not rakes.

3. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

- B. Concrete shall be thoroughly consolidated against and along the faces of all forms and along the full length and on both sides of all joint assemblies.
 - 1. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form.
 - 2. The vibrator shall never be operated longer than 15 seconds in any one location.
- C. Concrete shall be deposited as near to expansion joints as possible without disturbing them but shall not be dumped onto a joint assembly.
- D. For slip-form construction, concrete with a uniform slump not to exceed two inches (2") shall be adequately supplied in front of the paver.
 - 1. The rate of progress shall be controlled so that the forward movement of the paver will be as nearly continuous as practicable.
 - 2. If it is necessary to stop the forward movement of the paver, the vibrator and taping elements shall be stopped immediately.

3.4 FINISHING

- A. The sequence of finishing operations shall be the strike-off and consolidation, floating, if necessary, straight-edging, and final surface finish.
 - 1. The pavement shall be struck off and consolidated with a mechanical finishing machine, vibrator strike board, or by hand-finishing methods when approved by the engineer.
- B. In general, adding water to the surface of the concrete to assist in finishing operations shall not be permitted. If it is permitted, it shall be applied as a fog spray with approved spray equipment.
 - 1. After the pavement has been struck off and consolidated, it shall be floated with a straightedge 10 feet long equipped with a handle to permit operation from the edge of the pavement.
- C. Any excess water and laitance shall be removed from the surface of the pavement.
 - 1. The straightedge shall be operated parallel to the centerline of the pavement and shall be moved forward one-half its length after each pass.
 - 2. Irregularities shall be corrected by adding or removing concrete.
 - 3. All disturbed places shall be again straight-edged.
 - 4. The use of long-handled wood floats shall be confined to a minimum.
- D. Before final finishing is completed and before the concrete has taken its initial set, the edges of the slab and curb shall be carefully finished with an edger of the radius shown on the plans.
- E. For pavement constructed by the slip-form method, the edge settlement shall be determined as soon as practical after paving operations begin.
 - 1. Any edge settlement in excess of 3/8 inch shall be corrected before the concrete has hardened.
 - 2. When edge settlements in excess of 1/4 inch persist, paving shall be suspended and operational corrections made before the Engineer will permit the resumption of paving.

3. If the Contractor consistently fails to construct pavement within these tolerances, the use of slip-form methods shall be discontinued and pavement placed by means of conventional forms.

F. A transverse broom finish shall be used for final finishing.

1. A burlap drag shall be used just prior to finishing with transverse broom.

2. The drag shall be at least 3 feet long and wide enough to cover the entire width. It shall be laid on the pavement surface and dragged in the direction in which the pavement is being placed.

G. The final surface of the concrete pavement shall have a uniform gritty texture true to the grades and cross-section shown on the plans.

1. The Engineer may require changes in the final finishing procedure to produce the desired final surface texture.

H. Integral curbs shall be required along the edge of all street pavement where shown on the plans and shall be formed to the cross section in accordance with the plans.

1. They shall be constructed simultaneously with the pavement with extrusion equipment or hand formed immediately after the finishing operation.

I. The drainage of the gutter shall be checked while the concrete is still plastic by pouring water onto a piece of burlap at the gutter summit and observing its flow to the nearest inlet.

1. Necessary corrections shall be made at this time, and the curb shall then be given a burlap-textured finish to match the pavement.

J. The Contractor shall have always available materials to protect the surface of the plastic concrete against rain.

1. These materials shall consist of burlap, cotton mats, curing paper, or plastic sheeting.

3.5 CURING

A. Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, and mechanical injury for at least three (3) days after placement.

1. After the final finishing operations and as soon as it is possible to do so without marring the surface, the entire surface of the newly placed concrete shall be covered by whatever curing medium is applicable to local conditions and approved by the Engineer.

2. The edges of concrete slabs exposed by the removal of forms shall be protected immediately to provide these surfaces with continuous curing treatment equal to the method selected for curing the slab and curb surface.

B. The Contractor shall have the material and equipment needed for adequate curing at hand ready to install before actual concrete placement begins.

1. Failure to do so may be cause for the immediate suspension of construction operations.

3.6 JOINTING

A. All longitudinal and transverse joints shall conform to the plans, specifications, and standard details.

- B. All joints shall be constructed true to line with their faces perpendicular to the surface of the pavement.
- C. The surface of the pavement adjacent to all formed joints shall be finished to a true surface and edged to the radius as shown in the details.
 - 1. The surface across end-of-pour joints shall be checked with a ten (10) foot straightedge and any irregularities corrected before the concrete has hardened.
- D. When the pavement is laid in partial width slabs, transverse joints in the adjacent slab shall be placed in line with like joints in the first slab.
 - 1. In the case of widening existing pavements, transverse joints shall be placed in-line with like joints in the existing pavement and, when directed by the Engineer, in line with cracks functioning as joints.
 - 2. When filler strips are constructed, matching of joints will not be required.
- E. Forms shall be removed as called for in this specification under "FORMING." After the forms have been removed, the ends of all joints shall be cleaned and significant honeycombed areas shall be pointed.
- F. Sawing of joints shall be done with an approved concrete saw, and shall begin as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling, usually 4 to 24 hours.
 - 1. All joints shall be sawed before uncontrolled shrinkage cracking occurs.
 - 2. If necessary, the sawing operations shall be carried on both day and night, regardless of weather conditions.
 - 3. A standby saw shall be available in the event of breakdown.
 - 4. The water supply truck for the concrete saw will not be permitted on the pavement.
- G. Sealing of joints shall be completed before the pavement is opened to traffic and as soon after completion of the curing period as is feasible.
 - 1. Just before sealing, each joint shall be thoroughly cleaned of all foreign material, including membrane curing compound, and the joint faces shall be cleaned by means of sand blasting and thoroughly blown out with a stream of compressed air and surface-dry when the seal is applied.
 - 2. Material for seal shall be stirred during heating to prevent localized overheating.
- H. The sealing material shall be applied to each joint opening in accordance with the details or as directed by the Engineer.
 - 1. The joint filling shall be done without spilling material on the exposed surfaces of the concrete.
 - 2. Any excess material on the surface of the concrete pavement shall be removed immediately and the pavement surface cleaned.
 - 3. The use of sand or similar material to cover the seal shall not be permitted.
 - 4. Joint sealing material shall not be placed when the air temperature in the shade is less than 50 deg. F., unless approved by the Engineer.
- I. Longitudinal Construction Joints:
 - 1. Longitudinal bulkhead joints with hook bolts shall be used in part-width construction and where separate concrete curb or curb and gutter is to be constructed adjacent to the pavement and elsewhere as shown on the plans.

2. Construction shall be in accordance with the standard details.
 3. The concrete shall be edged to the dimensions show in the details.
 4. When placing the second slab, concrete must not be left overhanging the lip formed in the first slab by the edging tool.
- J. Longitudinal Lane Tie Joints With Tie Bars:
1. Longitudinal lane tie joints with tie bars shall be planes of weakness formed by sawing a groove in the hardened concrete to a depth of one-quarter the depth of the slab.
 - a. Tie bars shall be placed at the required depth parallel to the finished surface, at right angles to the joint and spaced at forty inches (40") on centers, unless otherwise called for.
 - b. The installation of lane tie bars shall be by the use of approved chairs or by the use of an approved mechanical device.
 - c. The placing of lane tie bars in the concrete by hand methods will not be permitted.
- K. Transverse Plane Of Weakness Joints:
1. Transverse plane of weakness joints may be created by sawing to one-quarter the depth of the slab or may be constructed immediately after the finishing operation has been completed by forming a groove in the plastic concrete with a metal forming strip to a depth of one quarter of the pavement thickness and indenting a premolded filler strip.
 - a. The premolded filler strip shall be placed from a bridge operating on the pavement forms.
 - b. The concrete shall be hand floated against the sides of the filler and the joint edged to the radius shown, unless otherwise directed.
 2. Transverse weakened plane joints shall be placed at intervals of twenty feet (for natural stone aggregate) or fifteen feet (for slag aggregate) between transverse expansion joints
- L. Transverse Expansion Joints:
1. Transverse expansion joints shall be placed at the spring lines of intersection radii, at end connections with structured or editing pavements and as shown in the standard details for cul-de-sacs, eyebrows and other special cases, as indicated on the plans.
 2. Expansion joints shall extend the entire width of the pavement and from the subgrade to one-half (1/2) inch below the surface of the pavement.
 - a. They shall not be of the dimensions and spacing as shown in the details. The filler shall be held accurately in place in vertical and longitudinal alignment during the placing and finishing of the concrete by bulkhead, a metal channel cap, or other approved method.
 3. Under no circumstances shall any concrete be left above or below the expansion material or across the joint at any point.
 - a. Any concrete spanning the ends of the joint next to the forms shall be carefully cut away after the forms are removed.
- M. Transverse Construction Joints:
1. Transverse construction joints shall be placed whenever the placing of concrete is suspended for more than thirty (30) minutes, and it is anticipated that placing of concrete will be resumed before the end of seven (7) days.

2. Prior to starting the work, the contractor shall obtain the engineer's approval for the method of installing night headers when the slip-form method of construction is used.
- N. Transverse End Of Pour Joints:
1. Transverse end of pour joints shall be placed whenever it is anticipated that concrete placing will be suspended for seven (7) days or longer.
 2. Prior to placing concrete in the first pour, the sleeved dowels with bulkhead shall be firmly secured to the subgrade, true to line and position.
 3. The bulkhead shall be sufficiently rigid to prevent deformation when concrete is placed and shall conform to the crown of the finished pavement.
 - a. The day after placing the first pour the dowels outside the first pour shall be carefully removed to avoid rupturing the fresh concrete.
 - b. The open end of the sleeve shall be plugged.
 - c. Prior to placing concrete in the second pour, the dowels to the second pour shall be screwed into the sleeves.
 4. This method shall be used for all transverse construction joints in conjunction with pavement gapping when it is anticipated that second pour will be placed more than seven (7) days after the first pour.
 5. When the construction (second pour) of the pavement will continue within seven (7) days, the joint will be formed as a standard construction joint.

3.7 WEATHER, PROTECTION AND LIMITATIONS

- A. The Contractor shall take such precautions as are necessary to protect the concrete from rain damage.
- B. Casting of concrete during hot weather shall be limited by the temperature of the concrete at the time of placing.
 1. Concrete shall not be cast when the temperature of the concrete is above 90 degrees F.
- C. No concrete shall be placed unless the temperature of the air in the shade and away from artificial heat is at least 20 degrees F. and rising, unless specifically approved.
- D. The Contractor shall employ whatever measures are necessary to prevent damage to the work and shall be responsible for the concrete placed during cold weather.
 1. Any concrete injured by frost action, as determined by the Engineer, shall be removed and replaced at the Contractor's expense.

3.8 INCIDENTAL CONSTRUCTION

- A. Concrete Headers:
 1. Concrete end headers shall be placed where shown on the plans and where directed by the Engineer.
 - a. Construction shall be as shown in the details.
 - b. Forming, placing, finishing, curing, etc., shall be in accordance with the applicable sections of this specification.
 - c. Unless shown in the proposal as a pay item, concrete end headers shall be constructed as incidental to concrete paving.
 2. Concrete widening headers of the detail show shall be placed where called for or directed in the field.

- a. Widening headers will be measured and paid for at the contract unit price per lineal foot.
- 3. Concrete headers adjacent to bridges and track crossings which are constructed by thickening the pavement will not be measured separately but shall be incidental to the construction of the pavement.
- 4. Spillway and slope protection headers will be measured and paid for as specified elsewhere in the plans and/or specifications.

B. Pavement Patching (Fast Setting):

- 1. This work shall consist of mixing, placing and curing of a special 9.0 sack fast-setting concrete with or without calcium chloride to be used for cast-in-place repairs and/or at other designated locations to be opened to traffic when a flexural strength of 300 psi is arranged.
- 2. When calcium chloride is to be added, the concrete shall be transported in a transit mix truck.
 - a. The recommended chloride addition rate (flake, 77%) is as follows: Ambient temperature less than 45 degrees F., 36 pounds per cubic yard of mix; 45 degrees to 65 degrees, 27 pounds; above 65 degrees, 18 pounds.
- 3. Approximate Time to Attain Required Strength
(For Information Only)

a.	Calcium Chloride added per cu. yd. of Concrete Mix	Approx. Time to Attain 300 psi Flexure Strength
b.	36 lbs.	4 to 7 hrs.
c.	26 lbs.	5 to 8 hrs.
d.	18 lbs.	6 to 12 hrs.
e.	9 lbs.	10 to 14 hrs.
f.	0 lbs	14 to 18 hrs.
- 4. The above time values are for an air temperature of 65 degrees F.
 - a. The initial set of a mix containing 36 lbs. of calcium chloride with a slump of 3 to 4 inch and poured in 72 degrees F. temperature will occur approximately 15 to 20 minutes after addition of the calcium chloride.
- 5. The basic 9.0 sack concrete mix shall be completely mixed except for chloride addition upon arrival at patch location.
 - a. When air temperature is less than 45 degrees F., the concrete temperature shall be not less than 60 degrees F.
- 6. The flake chloride shall be lump free and after addition of the calcium chloride the mixer will be given 20 revolutions at mixing speed before concrete is placed.
 - a. Water may be added at the job site.
 - b. Slump shall not exceed 4 inches.
- 7. Removal of the distressed concrete, placement and compaction of the subbase, where required, and form setting shall be completed prior to the arrival of the concrete.
 - a. Each repair shall be poured in one continuous operation.
 - b. The placement shall be scheduled in such manner that each repair is completed 20 minutes after addition of the calcium chloride.
- 8. When air temperature is below degrees F., insulated blankets 2 inches thick shall be placed over the new concrete as soon as it can be supported without damage to the surface.

9. Measurement and payment shall be as called for on the plans or in the proposal. The cost of calcium chloride and insulated blankets shall be included in the unit price bid for fast setting concrete.

C. Aggregate Shoulder:

1. This work shall consist of constructing an aggregate shoulder of the required thickness and width on a prepared subgrade.
 - a. The subgrade for the shoulders shall be graded to an elevation below the finished surface that will permit the placing of the specified thickness of shoulder material.
2. The aggregate shall be placed on the prepared subgrade to such a depth that the compacted layer will be not more than 5 inches thick.
 - a. Where the completed shoulder is to be more than 5 inches thick, it shall be constructed in two or more courses.
 - b. The aggregate shall be deposited on the shoulders by means of an approved mechanical spreader.
 - c. On irregular areas where the use of a mechanical spreader is not practical, the use of hand tools or power grading equipment will be approved for spreading and shaping of the shoulder material.
3. Dumping the aggregate on the road metal and grading it onto the shoulder will not be permitted.
4. The aggregate shall be compacted to not less than 100 percent of the maximum unit weight, by the use of pneumatic-tired compaction equipment or vibrator compactors
5. The rolling and compacting operation shall be performed immediately after the shoulder material has been spread.
 - a. Water shall be applied, when directed by the Engineer, to aid in the compaction and shaping of the surface.
 - b. The water shall be applied by means of approved sprinkler equipment.
6. Aggregate Shoulder, including any chemical additives will be measured and paid for as called for on the plans or in the Proposal.
 - a. Water used for shaping and compacting the aggregate shall be incidental to Aggregate Shoulder.

D. Riprap:

1. This work shall consist of constructing a protective covering of approved stone or broken concrete with or without mortar, as provided, on an earth bed, and shall include excavation and disposal of excavated material.
2. The bank on which the riprap is to be placed shall be trimmed to a uniform slope.

E. Plain Riprap.

1. The riprap shall commence in a trench below the toe of the slope and shall progress upward, each stone being laid by hand, one upon the other, so that they will break the joints with the stone in the course below and shall be firmly bedded into the slope against the adjoining stones.
2. The riprap and earth grouting shall be thoroughly compacted as the construction progresses so that the finished surface of the riprap will present an even, tight surface.
3. The thickness of the riprap shall be not less than nine inches measured perpendicular to the slope.
4. If broken concrete walk or pavement having a thickness of less than nine inches is used, the riprap shall be laid in a horizontal plane, and not in the plane of the slope.

5. The minimum thickness perpendicular to the slope shall be nine inches.

F. Grouted Riprap:

1. The stones shall be laid as specified for plain riprap.
 - a. Riprap which is to be placed on a slope shall be laid one upon the other, each in a full bed of mortar composed of one part of portland cement and three parts of fine aggregate by weight.
 - b. Mortar may be mixed by hand or by an approved mixer to such a consistency that it can be placed with a mason's trowel.
 - c. Re-tempering of mortar will not be permitted.
 - d. Sufficient mortar shall be used and worked with suitable tools to completely fill all voids, except that the face surface of the stones shall be left exposed.
 - e. Any excess mortar shall be removed with a stiff brush.
 - f. Grouted riprap shall be cured for a minimum period of three days by a method which has the prior approval of the Engineer.
2. Plain riprap or grouted riprap will be paid for at the contract unit price per square yard or as otherwise called for in the proposal, which price shall be payment in full for all excavation, trimming of bank and preparation of earth bed, disposal of surplus material, furnishing of materials and completing the work.
3. Other methods of slope protection, where called for on the plans or in the Proposal will be as specified elsewhere.

G. Existing Manholes, Valve Wells, Catch Basins, Etc.:

1. When indicated on the plans, and where within the street right-of-way, existing manholes, valve wells, hydrants, monument boxes, catch basins, etc., shall be adjusted, altered, or rebuilt as necessary and brought to new grades so as to conform to the new work.
2. This construction shall be done by the Contractor, and unless otherwise called for in the Proposal, it shall be considered as incidental work for which no special payment will be made.

3.9 TESTING:

- A. The Engineer will perform slump tests for consistency of concrete in accordance with ASTM C-143, and air content tests in accordance with ASTM C-231 (natural stone aggregate) or ASTM C-173 (slag aggregate).
- B. The Owner will employ an independent testing laboratory to perform strength tests on daily concrete specimens taken and cured in accordance with ASTM C-31.
 1. Test cylinders will be made at frequent intervals from the concrete being incorporated in the work.
 2. The Contractor shall store cylinders on the job in damp sand at proper temperatures and free from disturbances and deliver them to the laboratory within 48 hours after casting.
 3. Concrete for test specimens and labor for making and transporting them to the designated laboratory shall be furnished without charge by the Contractor.
- C. Cylinders tested in compression shall have a daily average strength at 28 days of not less than 3,750 psi, when tested in accordance with ASTM C-39.

1. Beams shall have a daily average flexural strength at 28 days of not less than 650 psi when tested by the third-point loading method (ASTM C-78).
 2. The above tests shall not be construed as the controlling factor in the design of the mix, but rather a measurement of the quality of the material placed in the work.
- D. The Owner may employ an independent testing laboratory to obtain and test core samples from the finished pavement when recommended by the Engineer.
1. In the event that core samples indicate a deficiency in pavement thickness, additional exploratory cores may be ordered to determine the area of deficient thickness in accordance with M.D.O.T. Standard Specifications for Construction, current edition, at the Contractor's expense.
- E. The Contractor shall have on hand all equipment necessary to test scales used in batching.
- F. Testing of embankment, subgrade, subbase density, trenches, etc., shall be conducted by an independent testing Laboratory employed by the Owner.
- G. Water used in mixing and curing which is known to be potable may be used without test.
1. Should the Owner approve the use of water from a source other than the Owner's water, which in the opinion of the Engineer is questionable, it shall be tested at the Contractor's expense.
- H. All materials proposed to be used may be inspected and tested at any time and at any place during their preparation, storage and use.
1. All tests of materials will be made in accordance with methods as described or designated in the specifications.
 2. The Contractor shall furnish without cost to the Owner or Engineer, the necessary certification that materials conform to the requirements of the specifications.
- I. All rejected materials shall be removed immediately from the job site.

3.10 OPENING TO TRAFFIC:

- A. The project under construction, or any section thereof, shall not be opened to traffic until so directed or authorized by the Engineer.
1. Whenever any section of the project is in suitable condition for travel, it may be opened for traffic previous to completion of the whole project, when so directed by the Engineer.
 2. Such direction shall not constitute partial or final acceptance of the work or any part of it, or a waiver of any of the provisions of the contract; provided, however, that on such sections of the project as are opened for traffic, the Contractor shall not be required to assume any expense entailed in maintaining the pavement as a result of ordinary wear and tear.
- B. Before opening any portion of the payment to traffic, it shall be swept clean by the Contractor and painted by the Owner, if necessary.
- C. Whenever the entire project or any section of it has been opened for traffic prior to acceptance and final payment the Contractor shall conduct the remaining construction operations so as to cause the least obstruction to traffic.

- D. Any damage to the pavement that may occur to a section of pavement open to traffic and due to defective materials or faulty workmanship, to natural causes other than ordinary wear, and to operations of the Contractor, shall be repaired by the Contractor at his expense.
- E. The Contractor shall take the provisions of this article into account in the preparation of his proposal since no additional payment will be made for damages, or as other compensation by reason of claimed interference, delays, or other loss and expense directly or indirectly arising out of the performance of the contract.

3.11 MEASUREMENT, ACCEPTANCE AND PAYMENT

- A. All longitudinal measurements for area of base courses, surface courses and pavements will be made along the actual surface of the roadway. For all transverse measurements for area of base courses, surface courses and pavements, the dimensions used in calculating the pay area shall be the neat dimensions provided on the plans or by authorization.
 - 1. The quantity of pavement laid shall be measured in place by the Engineer after construction of the pavement has been completed, and the accepted pavement shall be paid for at the contract unit price per square yard bid as called for in the proposal.
 - 2. This price shall constitute full compensation for furnishing, preparation, and installation of all materials, including all joints, joint filler, integral curbs, dowels, and reinforcing if required in the construction drawings, specifications and/or proposal; placing, finishing, curing, and all labor, equipment, tools, incidentals, and testing necessary to complete these items.
- B. Whenever the quantity of any item of work as given in the proposal shall be increased or decreased, payment for such item of work shall be at the contract price for the actual quantities of work done.
- C. Before the pavement will be considered for acceptance, all items shall be completed in accordance with the plans and specifications.
 - 1. Equipment, surplus materials, and construction debris shall be moved from the project.
- D. The Engineer shall make inspection of all work included in the contract as soon as possible after notification by the Contractor that the work is completed or after the Engineer's records show that the work is completed.
 - 1. If the work is not acceptable to the Engineer at the time of such inspection, he will advise the Contractor in writing as to the particular defects to be remedied before final acceptance.
- E. When the work has been completed and the engineer has ascertained that each and every part of the work has been performed in accordance with the plans and specifications, or such modifications thereof as he may have approved, the Engineer will submit his recommendation to the Owner for final acceptance and final payment will be made in accordance with the General Conditions and current ordinances and procedures of the Owner.

END OF SECTION

SECTION 02521

ALKALI-SILICA REACTIVITY (ASR) IN CONCRETE

PART 1 GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide portland cement concrete mixtures for the project that are resistant to excessive expansion caused by alkali-silica reactivity (ASR).
- B. The evaluation as to the resistance of submitted concrete mixtures to excessive expansion caused by ASR shall be by the Owner as described herein.

1.2 RELATED SECTIONS

- A. This Special Provision is supplemental to all other sections within the specifications of the Contract related to the construction of concrete items for the project.

1.3 SUBMITTALS

- A. One week after the Owner awards this project the Contractor shall submit to the Owner all proposed concrete mix designs. These shall include the following:
 - 1. Sources for all fine and coarse aggregates proposed to be used identified by their MDOT A.S.I # as listed in the Qualified Products List from the current MDOT Materials Source Guide if applicable or by an identifiable name if not applicable.
 - 2. Sources and recent mill test reports for all cementitious materials and supplementary cementitious materials proposed to be used.
- B. The Contractor also may submit for consideration the following:
 - 1. ASTM C 1260 (Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)) test results for the fine and /or coarse aggregates indicated on the proposed concrete mix designs.
 - 2. ASTM C 1567 (Determining the Potential Alkali Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)) test results for the specific proportionate combinations of cementitious, supplementary cementitious, fine, and coarse aggregate materials indicated on the proposed concrete mix designs.
 - 3. ASTM C 1293 (Determination of Length Change of Concrete Due to Alkali-Silica Reaction) test results for the fine and /or coarse aggregates indicated on the proposed concrete mix designs.

1.4 REFERENCES

- A. Portland Cement ASTM C 150
- B. Fine Aggregate ASTM C 33

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- C. Coarse Aggregate ASTM C 33
- D. Ground Granulated Blast Furnace Slag, Grade 100, 120 ASTM C 989

1.5 QUALITY ASSURANCE

- A. The Engineer shall review the submitted information and testing data submitted with the proposed concrete mixtures and any information and/or any test results with respect to ASR the Engineer has on record for the proposed aggregates and/or proportionate combinations of cementitious materials and aggregates.
 - 1. The criteria for approval of a proposed concrete mixture for resistance to excessive expansion caused by ASR shall be as follows:
 - a. If a proposed concrete mixture contains cement with an alkali level of less than 0.60% expressed as equivalent sodium oxide (percent $\text{Na}_2\text{O} + 0.658 \times$ percent K_2O) the mixture shall be considered to be resistant to the potential for excessive expansion caused by ASR.
 - 1) The determination of the alkali level of the proposed cement shall be made from the mill test reports submitted per Section 1.03.
 - b. If a proposed concrete mixture contains both fine and coarse aggregates for which there is testing per ASTM C 1260 that shows that both the fine and coarse aggregates produce expansions of less than 0.10%, the fine or coarse aggregate used to construct the mortar bar shall be considered to be “innocuous” (per Appendix X1 of ASTM C-33). Concrete mixtures that include both fine and coarse aggregates considered to be innocuous shall be considered to be resistant to excessive expansion caused by ASR.
 - c. If a proposed concrete mixture for which there is previous testing per ASTM C 1567, shows the proposed combination of cementitious materials and aggregates produce expansions of less than 0.10% the mixture shall be considered to be resistant to excessive expansion caused by ASR.
 - d. If a proposed concrete mixture for which there is previous testing per ASTM C 1293 shows that both the fine and coarse aggregates meets the criteria of Appendix XI of ASTM C 1293 with respect to the non-reactivity of the aggregate, the mixtures shall be considered to be resistant to excessive expansion caused by ASR.
 - e. If, based on the Engineer’s evaluation, additional testing of the fine and / or coarse aggregates is needed to make the evaluations as discussed herein; the Owner shall perform such testing.
 - 1) The Owner shall have access to all materials, including aggregate pits, in order to obtain samples for such additional testing.
 - 2) The Owner shall perform the following test using the fine and/or coarse aggregates proposed for each concrete mixture: ASTM C 1260 – Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar – Bar Method).
 - 3) All samples submitted for testing per ASTM C 1260 shall first be tested to establish conformance to the required material specification for gradation.
 - 4) All samples submitted shall meet the required material specification for gradation prior to being submitted for testing per ASTM C1260.

2. If, based on the Engineer's evaluation, the submitted concrete mixture does not meet any one of the criteria of 1.05A.1. the mixture shall be rejected or be mitigated by Methods 1. or 2. as follows:
 - a. Method 1. Use of a cement with an alkali level of less than 0.60% expressed as equivalent sodium oxide (percent Na₂O + 0.658 x percent K₂O).
 - 1) The determination of the alkali level of the proposed cement shall be made from the mill test reports submitted per Section 1.03.
 - b. Method 2. Substitution of a portion of the cement with Ground Granulated Blast Furnace Slag (GGBFS) Grade 100 or 120 (ASTM C 689).
 - 1) For Method 2, the maximum substitution of cement with the GGBFS permitted shall be 35% by weight of total cementitious material (cement plus GGBFS).
 - 2) For Method 2, the effectiveness of the proposed cement-GGBFS combination to resist the potential for excessive expansion caused by ASR for each aggregate that is considered to be potentially reactive shall be demonstrated.
 - 3) The effectiveness of the proposed cement-GGBFS combination shall be based on test mortar bars per ASTM C 1260 using each fine or coarse aggregate that has been considered to be potentially reactive and the proposed cement-GGBFS combination for the concrete mixture.
 - 4) The criteria for evaluating the mitigation of a proposed concrete mixture with respect to ASR by Method 2. shall be as follows:
 - a) If a mortar bar constructed of an aggregate that is considered to be potentially reactive and the proposed cement-GGBFS combination produces an expansion of less than 0.10%, the aggregate and proposed cement-GGBFS combination shall be considered to be resistant to excessive expansion caused by ASR.
 - b) Concrete mixtures that include both fine and coarse aggregates considered to be resistant to excessive expansion caused by ASR by mitigation Method 2. as described herein shall be considered to have been adequately mitigated with respect to and resistant to excessive expansion caused by ASR.
 - c) If a mortar bar constructed of an aggregate that is considered to be potentially reactive and the proposed cement-GGBFS combination produces an expansion of 0.10% or greater, concrete mixtures containing these materials shall not be considered resistant to the potential for excessive expansion caused by ASR and the concrete mixture shall be rejected.
 - c. The contractor shall be responsible for all costs associated with the mitigation of a concrete mixture for ASR and any delay costs incurred from the Owner if, due to the mitigation method selected by the Contractor, it takes the Contractor beyond their completion dates.
- B. If the Contractor intends to change suppliers or if the supplier intends to change concrete mixtures after the evaluation and/or Mortar-Bar tests are performed, the Contractor shall inform the Owner immediately, but not less than forty-five (45) days prior to concrete batching.

1. Upon notification, all concrete work will be postponed, without any additional costs or extension of time allowed by the Owner, until evaluation of the new mixtures and testing of the new materials, if needed, have been completed.
- C. The Owner will be testing the concrete that is delivered to the project site so as to insure that the approved mix design is being followed.
1. To assist the Owner in establishing that the approved mix design is being followed, the supplier shall include on the delivery ticket for each batch of concrete delivered to the job, the identification and proportions of each material batched.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02525

RUBBER EXPANSION JOINTS

PART 1 GENERAL

1.1 USE OF RUBBER EXPANSION JOINT

1. In any expansion joint in concrete (curb & gutter, sidewalks and driveways) on this project, the expansion joint placed must be recycled rubber expansion joint. See the following sheets for more details.

PART 2 PRODUCTS

1. See the following sheets for more details.

PART 3 EXECUTION

Not Used.

END OF SECTION



RUBBER EXPANSION JOINT MATERIAL

Meets or exceeds the performance requirements of ASTM D1751-97 & D1752-84

Manufactured by
THE J D RUSSELL COMPANY

CONCRETE JOINT FILLER

REFLEX® is made of 100% recycled materials – largely discarded tires!

Did you know America discards over 250,000,000 tires every year? An estimated 3 billion tires clutter our dumps and yards! Why not specify a better performer, REFLEX®, and make the choice to help our environment?

Use REFLEX® on your next single family residence project and consume the equivalent of 8.3 passenger tires. As many as 300 tires can be recycled in just one mile of highway including associated drives, approaches, sidewalks and ramps.

GENERAL DESCRIPTION

REFLEX® Rubber Expansion Joint Material for Concrete is a processed board product formed by blending granular crumb rubber derived from discarded tires and various low density polymer components. Pre-molded under heat and pressure, REFLEX® is far more durable than current alternatives.

APPLICATIONS

REFLEX® Rubber Expansion Joint Material is suitable for use as expansion or control joint in a wide variety of concrete construction projects such as roadways, sidewalks, driveways, flooring, parking lots, patios and curbs.

TYPICAL PROPERTIES	REFLEX RUBBER
Compression (to 50% of original)	passes
Recovery (within 10 minutes)	99-100%
Extrusion	+0.10 inch
Density	40 lbs/cu ft
Water absorption	<2%
Ultraviolet light exposure	passes
Cold temperature exposure	passes @ -50 deg. F

SIZE AND THICKNESSES

Standard Sheet Sizes – 36" wide by 5', 10' and 12' long in thicknesses of 1/4", 3/8", 1/2" 3/4" and 1". Cut to size strips from 2" to 36" in 1/2" increments.

Submersion in salt solution, gasoline, diesel and motor oil resulted in no change in volume while mass increased indicating absorption of the fluids. No cracking or mechanical degradation occurred.

Durability: Exhibits favorable long term aging characteristics under laboratory testing conditions and will not degrade.

Non-Staining: Will not bleed or migrate to adjacent finished concrete surfaces like petroleum based products can do.

® Rubber Expansion Joint meets or exceeds the performance requirements of:

American Association of State Highway and Transportation Officials Specification M-213-95 and M-153-98.

Federal Specification HH-F-341f, Type 1.

American Society for Testing Materials Standard Specifications for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction D1751-97 and D1752-84 (1996).

www.reflexrubber.com
www.jdrussellco.com



EXPANSION JOINT

M A S C O . N E T

SLAB/HORIZONTAL

Reflex®

reflex® Rubber Joint Expansion Joint material for concrete is a processed board product formed by blending granular rubber derived from discarded tires and various low density polymer components. Premolded under heat and pressure, it is more durable than current alternatives. Suitable for use as expansion or control joint in a wide variety of concrete construction projects such as roadways, airport runways, sidewalks, driveways, flooring, parking lots, patios and curbs.

Conforms to:

ASTM D-1751-97 and ASTM D-1752-84
 AASHTO M-153-98 and AASHTO M-213-95
 HH-F-341F TYPE I

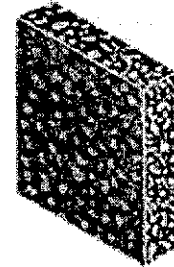
No.	Size	Lf/Bndl	Wt/Bndl (lbs)
EX 123R	1/2"x3"	64	28.0
EX 12312R	1/2"x3-1/2"	56	28.0
EX 124R	1/2"x4"	48	28.0
EX 126R	1/2"x6"	32	28.0
EX 142R	1/4"x2"	288	41.0

Self Expanding Cork

Molded of selected cork granules and resin binders then specifically treated to permit expansion of as much as 50% of original thickness. The material is non-extruding and used where excessive contraction is anticipated. Because of its mechanical sealing properties, it is particularly suited for joints in liquid-containing structures, (in conjunction with waterstops and/or sealants) or for preventing intrusion of foreign matter into overly contracted joints. Elastomeric, chemically-cured sealants are recommended for use with this product. Weight at 1/2" thickness is 1.2 lbs per sf.

Conforms to:

ASTM D 1752 Type III
 HHF 341F Type II, Class C
 FAA P610-2.7
 AASHTO M 153 Type III
 CRD C 509 Type III

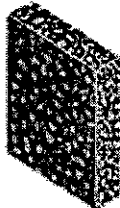


Cork

Prefomed from selected cork particles and bonded together with an insoluble resin. This joint filler is resistant to acids and alkalis, is flexible, waterproof and light in color. It will not extrude when compressed to 50% of its original thickness and will recover to approximately 95% when released. Cork expansion joint is compatible with elastomeric, chemically cured sealant. Applications include water and sewage treatment plants, flood walls, outlet works, spillways and industrial construction. Weight at 1/2" thickness is .75 lbs per sf.

Conforms to:

ASTM D 1752, Type II
 HHF 341F, Type II, Class B
 AASHTO M 153 Type II
 CRD C509, Type II
 FAA P610-2.7



Sponge Rubber

Neoprene sponge rubber is resilient and compressible. It will compress without extruding and recover to 90% of its original thickness. It is compatible with all chemically-cured elastomeric sealants and can be used as an alternate to cork (meets all test requirements). Ideal for use in water and sewage treatment plants, flood walls, outlet works, spillways, bridges, commercial and industrial construction. Weight at 1/2" thickness is 1.36 lbs per sf.

Conforms to:

FAA P610-2.7
 HHF 341F Type II, Class A
 ASTM D 1752 Type I
 CRD-C 509 Type I
 AASHTO M 153 Type I



SECTION 02530

CONCRETE CURB AND GUTTER

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. This work shall consist of constructing portland cement concrete curb, gutter or combination curb and gutter, with or without steel reinforcement as provided on a prepared base.
- B. The construction shall follow the construction of concrete base course or concrete pavement but shall be in advance of the construction of non-rigid types of pavement or base course.
- C. The materials and construction shall be as specified in MDOT Specification Section 6.09.

1.2 SUBGRADE

- A. The subgrade shall be prepared in accordance with Specification Section 02200, Earthwork, and shall be maintained as prepared, true to the required grade and cross section, until the concrete has been placed thereon.

1.3 FORMS

- A. Forms shall be of metal, straight and free from distortion, and of sufficient strength to resist springing during the process of depositing concrete against them. They shall be of an approved section with a flat surface on top. Wood forms may be used on sharp turns and for special sections when approved by the Engineer. The forms shall be of the full depth of the structure and shall be so construct as to permit the inside forms to be securely fastened to the outside form. Face and back forms will be required when constructing straight curb, and back forms with templates of the required curb shape shall be used when constructing roll curb. Approved flexible forms will be required where the radius to the back of curb is less than 200 feet.
- B. Forms shall be well built, substantial and unyielding. They shall be securely staked and braced to the required line and grade, and sufficiently tight to prevent the leakage of mortar. The forms shall be thoroughly cleaned and oiled with a light clear paraffin oil which will not stain the concrete.
- C. No concrete shall be placed until the subgrade and forms have been approved by the Engineer. The subgrade shall be wetted and the concrete deposited to the proper depth. The concrete shall be spaded sufficiently to eliminate all voids, after which it shall be finished smooth and even by means of a float.
- D. The placing and finishing of concrete curb and gutter by the use of a mechanical curb and gutter paver will be permitted, provided the required cross section and finish is obtained. Should the use of such mechanical paver produce curb or curb and gutter having an unsatisfactory cross section or finish, the use of such machine shall be discontinued and the

construction shall be done as otherwise required by these Specifications. All unsatisfactory work shall be removed and replaced as directed by the Owner at no cost to the Owner.

1.4 REINFORCEMENT

- A. When steel reinforcement or tie bars are called for on the plans, the bars shall be properly spaced and held in the correct position during the placing of concrete by the use of bar chairs or other approved devices. Bars shall be lapped at least 10 inches unless otherwise shown on the Plans.

1.5 JOINTS

- A. Joints shall be constructed with their faces perpendicular to the surfaces of the structure, and shall not vary more than 1/4 of an inch from their true designated position.
- B. The concrete at the faces of all joints shall be thoroughly spaded and compacted to fill all voids and all exposed surfaces shall be finished smooth and true to grade.

1.6 EXPANSION JOINTS

- A. Expansion joints of 1 inch thickness shall be placed through the curb, or gutter, or combination curb and gutter, at the springline of all street returns and elsewhere as shown on the plans.
- B. The expansion joint material shall be precut so as to conform to the geometric shape and cross sectional area of the structure. The joint filler shall extend to the full depth of the joint and the top shall be flush with the finished surface of the structure. No reinforcing steel shall extend through an expansion joint.

1.7 PLANE OF WEAKNESS JOINTS

- A. Plane of weakness joints shall be placed through the structure at a uniform interval of 10 feet unless otherwise directed by the Engineer. No curb or curb and gutter section shall be less than 5 feet in length.
- B. Plane of weakness joints shall be formed by steel templates 1/8 inch in thickness, shaped to conform to the required cross section of the structure, which shall not extend below the top of the steel reinforcement or which shall be notched to permit the steel reinforcement to be continuous through the joint. The templates shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place.

1.8 CONSTRUCTION JOINTS

- A. Construction joints shall be placed at the end of each day's pour, unless the pour ends at an expansion joint.
- B. Construction joints shall be formed by steel templates 1/8 inch in thickness, shaped to conform to the required cross section of the structure. The templates shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place. No reinforcing steel shall extend through the construction joint.

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1.9 FINISHING

- A. The edges of the gutter, the back top edge of the curb and all transverse joints shall be rounded with an approved finishing tool having a radius of 1/4 inch. The face of the curb, at the top and bottom, shall be rounded with approved finishing tools having the radii shown on the plans.
- B. The exposed surfaces of the concrete curb, gutter, or combination curb and gutter, shall be finished smooth and even by means of a moistened wooden float or other means having the approval of the Engineer. The finished surfaces shall not vary more than 1/8 inch in 10 feet from the established grade. Neat cement or mortar shall not be used to facilitate the finishing of surfaces.
- C. Immediately after the forms are removed, all visible areas of honeycomb and minor defects shall be filled with mortar, composed of one part portland cement and two parts fine aggregate from the same sources as used in the structure, applied with a wooden float. Immediate steps shall be taken by the Contractor to correct the conditions contributing to these defects.

1.10 CURING

- A. After the finishing operations have been completed and immediately after the free water has left the surface, the surface of the concrete shall be completely coated and sealed with a uniform layer of white membranous curing compound. The compound shall be applied in one or two applications as directed by the Engineer. When the compound is applied in two increments, the second application shall follow the first application within 30 minutes.
- B. The compound shall be applied in a continuous uniform film by means of mechanically pumped pressure sprayer equipment at the rate directed by the Engineer, but not less than one gallon per 200 square feet of surface. The equipment shall provide adequate stirring of the compound during application. The equipment for applying the compound must be on the project and approved by the engineer before work is started.
- C. If the compound is too thick for satisfactory application during cold weather, the material may be warmed in a water bath at temperatures not over 100 deg. F. Thinning with solvents will not be permitted.

1.11 DAMAGED SURFACES

- A. If rain falls on the newly coated pavement before the film has dried sufficiently to resist damage, or if the film is damaged in any other way, the Contractor will be required to apply a new coat of material to the affected areas equal in curing value to that specified for the original coat. The treated surface shall be protected by the Contractor from injury for a period of at least 7 days. Immediately after the forms are removed, the entire area of the sides of the curb shall be coated with the curing compound.
- B. The Contractor shall provide on the project sufficient burlap or cotton coverings for the protection of the pavement in case of rain or breakdown of the spray equipment. If hair checking develops before the curing compound can be applied, the procedure as specified herein shall be modified in that preliminary curing with wetted burlap or cotton coverings, as specified under the general requirements for curing, shall be performed before curing compound is applied.

1.12 BACKFILLING

- A. After the concrete has sufficiently cured, the curb, gutter or combination curb and gutter, shall be backfilled to the required elevation with approved material, which shall be compacted and left in a neat and workmanlike condition.

1.13 MEASUREMENT AND PAYMENT

- A. Concrete curb, gutter and curb and gutter will be measured in place, by length in lineal feet, along the base of the curb face or along the flow line of the gutter, with no deductions in length for catch basins or inlet castings.

END OF SECTION

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SECTION 02550

MAINTAINING TRAFFIC

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The work covered by this Specification shall consist of measures necessary to protect and maintain traffic and protect the work while the Contract is in force

The Michigan Manual of Uniform Traffic Control Devices, current edition, including all subsequent revisions thereto, is hereby established as part of these Specifications.

1. DEFINITIONS

Where the following terms are used in these specifications or on the plans, they are defined as follows:

CIA (Construction Influence Area) - The project and the area surrounding the project, as shown on the plans which has been determined by the Municipality to define the limits of responsibility for traffic control as specified herein.

Traffic Control Devices - Signs, signals, lighting devices, barricades, delineators, pavement markings, traffic regulators and all other equipment shown on the plans or determined by the Engineers as necessary for protecting and regulating traffic.

Local Traffic - That traffic which has origin or destination within the CIA.

Project Limits - The boundaries of the area in which the items under contract are being placed.

Traffic Lane - The portion of the traveled way for the movement of a single line of vehicles.

Traffic Regulator - A person properly dressed and equipped with the necessary signs as specified in the current Michigan Manual of Uniform Traffic Control Devices.

2. RESPONSIBILITIES

The Engineer will show each major stage of construction on the plans, including the basic traffic control devices required for each stage. Portable traffic control devices normally will not be shown.

The Contractor will furnish and maintain all necessary traffic control devices outside the CIA.

The Contractor will furnish, install and maintain electrical devices requiring connections to public utilities when they are specifically called for on the plans.

The Contractor will place and maintain all pavement markings, unless otherwise specified.

The Contractor will normally fabricate, furnish, install and maintain all special signs that may be required for an individual project, unless otherwise specified. Where lighting devices are called for on special signs provided by the Contractor, they will be furnished, installed and maintained by the Contractor.

The Contractor shall furnish, install and maintain all traffic control devices inside the CIA, unless otherwise specified; and shall remove such traffic control devices from the project when no longer required, as determined by the Engineer.

The Contractor shall be responsible for the actions of his Subcontractors in relation to placement, maintenance and removal of traffic control devices.

The Contractor shall designate, in writing, to the Engineer, a Safety Supervisor and an alternate. The identity of these persons, including their addresses and telephone numbers, shall also be made known to the municipal Police and Fire Departments, as well as the municipality's Sheriff's Department and the State Police, where applicable, in order that immediate communication may be possible in emergencies, at night, over weekends, during the holiday periods and at such other times when construction operations are not in progress. Changes in the designation of the Safety Supervisor or the alternate shall immediately be made known, in writing, to the Engineer.

The Contractor's designated Safety Supervisor, or his alternate, shall be available at all times to the Engineer. He shall meet with the Engineer before work on the project is started to review plans for the protection of traffic in the CIA and shall meet with him periodically as the work progresses to discuss such modifications of these plans and may be required.

The Contractor's Safety Supervisor shall review the safety activities of each subcontractor and shall see that they are properly coordinated with those of the Contractor.

3. GENERAL PROVISIONS

In all cases, the Contractor shall provide reasonable access and reasonable facilities for local traffic to property along the project by means of temporary roadways, culverts, bridges or other means approved by the Engineer.

Where traffic is to be maintained over pavement to be removed during a succeeding stage of construction, breaking operations shall not begin until immediately before pavement removal.

When equipment and materials to be used in the work are located within the right-of-way of any street or road, the traveling public shall be safeguarded by suitable and sufficient signs, lights, barricades, or other means furnished and maintained by the Contractor. Such protection will be considered as incidental to construction. No materials or equipment shall be stored within 15 feet of a traveled roadway, unless otherwise provided or specifically authorized.

The Contractor shall notify the Engineer and the Municipality before starting any work that might inconvenience or endanger traffic in sufficient time so that arrangements may be made for publicizing the impending construction, closing the road and providing detours, signs and barricades for the maintenance of traffic. No road or section thereof shall be closed to traffic unless provided on the plans, in the specifications, or as permitted by the Municipality.

Should the Contractor wish to make minor stage construction deviations from the plans, he shall submit his request and proposed plan revision to the Engineer and Municipality not less than five (5) working days prior to changing traffic patterns for review and approval. Additional traffic control devices within the CIA required because of approved deviations from stage construction shall be furnished, installed and maintained by the Contractor at no additional cost to the Municipality, and must be properly placed before any such deviating stage construction can commence.

Unless otherwise provided, the Contractor shall conduct his operations and the use of his equipment in such a manner that two-way traffic will be provided throughout the entire length of the project. Temporary structures, bridges over pavement, pavement gaps or other means approved by the Engineer and the Municipality shall be employed where required. Bridges over pavement shall be of a design approved by the Engineer. The length of pavement gaps shall be as directed by the Engineer and gaps shall remain open until the adjacent concrete pavement has attained a modulus of rupture of at least 550 p.s.i.

At specific locations shown on the plans where special problems in handling of through traffic are involved, the construction shall be by the part-width method, one lane at a time or half of an intersection at a time while through traffic is being maintained on the remaining lanes and shoulders. Temporary widening and surfacing of the shoulders may be required.

Where shoulders, detours and/or temporary roads are used to maintain traffic, they shall be graded, surfaced and treated for dust at such times and locations and in such amounts as directed by the Engineer.

The roadway shall be graded and maintained in a condition satisfactory for traffic during the construction of the project. Should the construction work be suspended due to weather conditions or for any other reason, sufficient labor, materials and equipment shall be ready for immediate use at all times for proper maintenance.

When temporary road and drives are no longer needed, they shall be obliterated as part of this work. Restoration shall be considered incidental to the Contract unless a provision is provided elsewhere in this Contract. No additional compensation will be allowed.

When conditions are such as to warrant the Engineers' authorization of one-way traffic through a construction area, the Contractor shall maintain a traffic regulator at each end of the one-way section. Traffic regulators shall be equipped with two-way radios when required by the Engineer.

At intersections of minor roads and streets, where traffic can be taken care of reasonably by temporary re-routing, the crossing may be closed upon approval of the Engineer and the Municipality.

All moving equipment operating in traffic areas shall operate with headlights turned on provided such headlights are included as original vehicle standard equipment.

4. TRAFFIC CONTROL DEVICES

All traffic control devices placed by the Contractor shall conform to the design, condition, placement and lighting requirements specified in the Michigan Manual of Uniform Traffic Control Devices and the plans.

Only traffic control devices appropriate to conditions at the time shall be displayed.

All traffic control devices shall be cleaned, repainted, re-reflectorized or replaced, as determined by the Engineer to continually provide adequate visibility and legibility, and shall be maintained in place in proper condition until the work is completed or until no longer required.

In addition to the traffic control devices shown on the plans, the Contractor shall furnish temporary traffic control devices which conform to the Michigan Manual of Uniform Traffic Control Devices to provide protection to traffic from open trenches, excavations, obstructions and any other hazardous conditions or situations as may exist. When the shoulders at the edges of pavement are low, high, soft or rough, while maintaining traffic on pavement, the Contractor shall place and maintain a sufficient number of approved lighted devices to warn traffic adequately during the hours of darkness. The lights shall be placed along the edge of the pavement with a maximum distance of 50 feet between lights or as specified by the Engineer. Lights shall be spaced more closely on curves, at intersections and/or where required for safety.

Road closure barricades shall be provided with warning lights which shall be lighted from one hour before sunset to one hour after sunrise. Such warning lights shall consist of either three (3) flashing, yellow, battery-operated lights with seven (7) inch diameter lenses or three (3) 60-watt, yellow, incandescent lamps and shall be mounted on the top of the barricade.

All other barricades, warning signs and points of special hazard in place under traffic during the hours of darkness shall be adequately lighted with at least one (1) yellow, battery-operated flashing light unless otherwise directed. All warning signs in use during hours of daylight may be supplemented with high-level warning devices, consisting of fluorescent orange flags positioned above the signs.

Existing warning and regulatory signs shall not be taken down but shall be maintained during the progress of the work in their approximate normal position.

Temporary or permanent traffic signs, in addition to those placed within the CIA by the contractor may be placed within the CIA by the municipality or another contractor working in the same area or on an adjacent project, or other authorized agency, when approved by the Engineer. Such temporary or permanent signs shall only be those required for the safety and direction of traffic because of operations other than the Contractor's operations. Such signs shall be the responsibility of the agency placing them and shall be protected from damage and shall not be removed unless authorized by the Engineer.

When, in the opinion of the Engineer, Traffic Control Devices are deficient, inadequate or improper, or conditions within the CIA are such that safety is adversely affected, the Contractor or his Safety Supervisor will be immediately notified. Such notice will be accomplished by a statement of the corrective action to be taken. If the Contractor fails to comply promptly with such instructions, the Engineer may stop any or all work on the project until satisfactory corrective action is taken. In the event that the Contractor neglects to take any corrective action, the Engineer may order such work as is deemed necessary to insure public safety done by the Municipality or outside forces at the Contractor's expense.

When, in the opinion of the Engineer, an emergency condition exists that requires immediate action to protect life or property, the Engineer, without notice to the Contractor, may order such work as deemed necessary to be done by Municipality or outside forces at the Contractor's expense.

Traffic control devices provided under this section (signs, barricades, plastic drums, warning lights, etc.) shall conform in function, design and application to the requirements of the latest version of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) and the MDOT 2020 Standard Specifications for Construction.

Barricades/Plastic Drums:

All excavated areas shall be delineated by Plastic Drum spaced at a maximum of 25 feet apart, along the entire length of the excavation. The Daily erection and disassembly of channelizing devices and warning lights shall be included in "Minor Traf Devices" - Lsum.

Signs:

Standard sign sizes and colors as shown in "MMUTCD" shall be used to make the approach to active construction areas to direct motorists. All signs shall be reflectorized. The location, type and wording of warning and guide signs are shown on the plans as part of this project.

Dust Control Requirements:

The adequate use of sprayed water and/or dust palliative shall be employed so as to control the dust in the C.I.A. Dust control shall be paid for as: Dust Palliative, Applied - Ton

Maintenance Gravel:

Any maintenance gravel required to maintain traffic shall be paid for as: Maintenance Gravel - Ton. Owner must approve all use of this pay item for reimbursement.

5. METHOD OF PAYMENT

The work covered by this Specification, consisting of measures necessary to protect and maintain traffic and protect the work while the Contract is in force, shall be considered incidental to the Contract unless a provision is provided elsewhere in this Contract. No additional compensation will be allowed.

The cost of any emergency work and/or other work ordered to be performed by the Engineer at the Contractor's expense, as previously described within this Specification, will be deducted from payments due on the Contract.

The completed work as measured shall be paid for at the Contract unit price for the following contract items (pay items):

Pay Item	Pay Unit
Barricade, Type III, High Intensity, Furn	Each
Barricade, Type III, High Intensity, Oper.....	Each
Plastic Drum, High Intensity, Furn.....	Each
Plastic Drum, High Intensity, Oper	Each
Sign, Type B, Temp, Prismatic, Furn	Each
Sign, Type B, Temp, Prismatic, Oper.....	Each
Sign, Type B, Temp, Prismatic, Special, Furn	Each
Sign, Type B, Temp, Prismatic, Special, Oper	Each
Lighted Arrow, Type C, Furn	Each
Lighted Arrow, Type C, Oper.....	Each
Traffic Regulator Control	Lump Sum
Minor Traf Devices.....	Lump Sum

Any additional signing or maintaining traffic devices required to expedite the construction shall be at the contractor's expense.

END OF SECTION

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET FEET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
1	10	15	20	27	45	50	55	60	65	70
2	21	30	41	53	90	100	110	120	130	140
3	31	45	61	80	135	150	165	180	195	210
4	42	60	82	107	180	200	220	240	260	280
5	52	75	102	133	225	250	275	300	325	350
6	63	90	123	160	270	300	330	360	390	420
7	73	105	143	187	315	350	385	420	455	490
8	83	120	163	213	360	400	440	480	520	560
9	94	135	184	240	405	450	495	540	585	630
10	104	150	204	267	450	500	550	600	650	700
11	115	165	225	293	495	550	605	660	715	770
12	125	180	245	320	540	600	660	720	780	840
13	135	195	266	347	585	650	715	780	845	910
14	146	210	286	374	630	700	770	840	910	980
15	157	225	307	400	675	750	825	900	975	1050

TAPER LENGTH "L" IN FEET

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

"L" = $\frac{W \times S^2}{60}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

- L = MINIMUM LENGTH OF MERGING TAPER
- S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
- W = WIDTH OF OFFSET

TYPES OF TAPERS

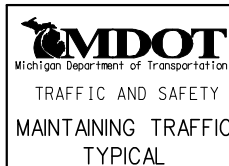
UPSTREAM TAPERS

- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- TWO-WAY TRAFFIC TAPER

DOWNSTREAM TAPERS (USE IS OPTIONAL)

TAPER LENGTH

- L - MINIMUM
- 1/2 L - MINIMUM
- 1/3 L - MINIMUM
- 100' - MAXIMUM
- 100' - MINIMUM (PER LANE)



TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006	M0020a	SHEET 1 OF 2
CHECKED BY: BMM	PLAN DATE:		
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn		REV.	08/21/2006

DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D"
AND LENGTH OF LONGITUDINAL BUFFER SPACE ON
"WHERE WORKERS PRESENT" SEQUENCES


"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF
LONGITUDINAL BUFFER SPACE "B"



SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

* POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

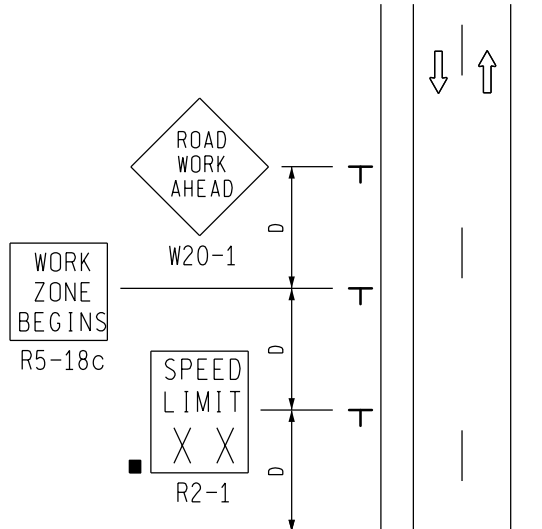
 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TABLES FOR "L", "D" AND "B" VALUES		
	DRAWN BY: CON:AE:djf CHECKED BY: BMM	JUNE 2006 PLAN DATE:	M0020a
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn REV. 08/21/2006			

KEY

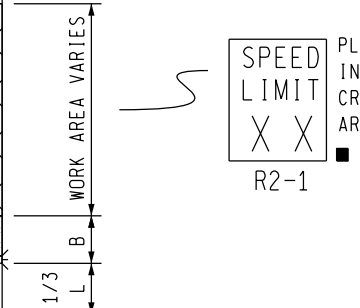
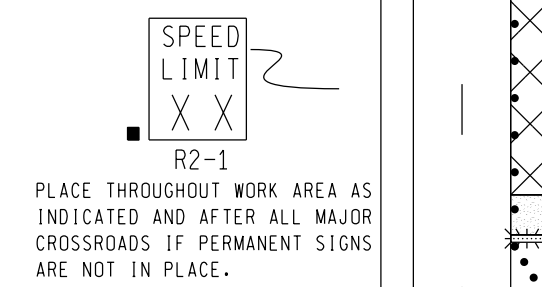
- • • CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT
- * USE THE "NEXT -- MILES" SIGN WHEN SHOULDER CLOSURE EXCEEDS 1 MILE IN LENGTH

SIGN = 120 ft± - TYPE B
 W/PLAQUE = 132 ft± - TYPE B
 PLUS ADDITIONAL R2-1's
 THROUGHOUT WORK AREA

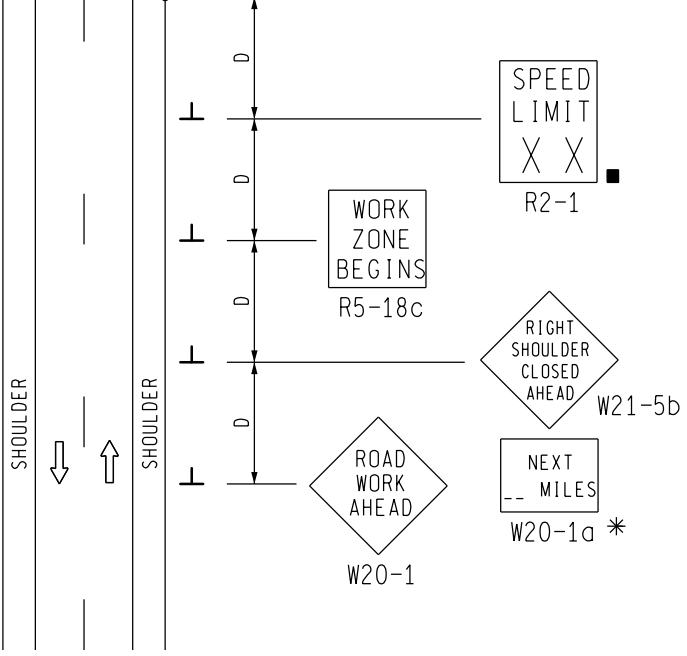
PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.




END ROAD WORK
 PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



END ROAD WORK
 PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



NOT TO SCALE

 Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON A TWO LANE TWO-WAY ROADWAY NO SPEED REDUCTION	
	DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0110a.dgn REV. 10/04/2011		


NOTES

1. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
 $1/3 L$ = MINIMUM LENGTH OF TAPER
 B = LENGTH OF LONGITUDINAL BUFFER
 SEE **M0020a** FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 29A. THE TYPE OF REFLECTIVE SHEETING USED FOR THE W20-1a PLAQUE SHALL BE THE SAME AS THE TYPE USED FOR THE PARENT SIGN.

SIGN SIZES

DIAMOND WARNING	- 48" x 48"
W20-1a PLAQUE	- 48" x 36"
R2-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"

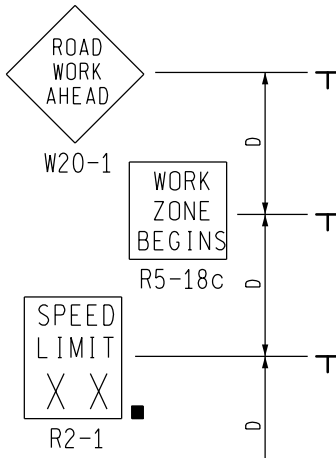
NOT TO SCALE

 MDOT Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON A TWO LANE TWO-WAY ROADWAY NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf	OCTOBER 2011	M0110a	SHEET
CHECKED BY: BMM:CRB	PLAN DATE:		2 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0110a.dgn REV. 10/04/2011			

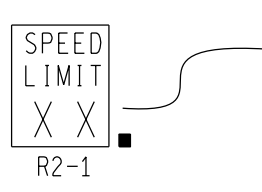
KEY

- • • CHANNELIZING DEVICES
- ⚡ LIGHTED ARROW PANEL
- ➡ TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT

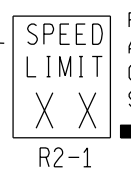
SIGN = 136 ft±2 - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA



END ROAD WORK
PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



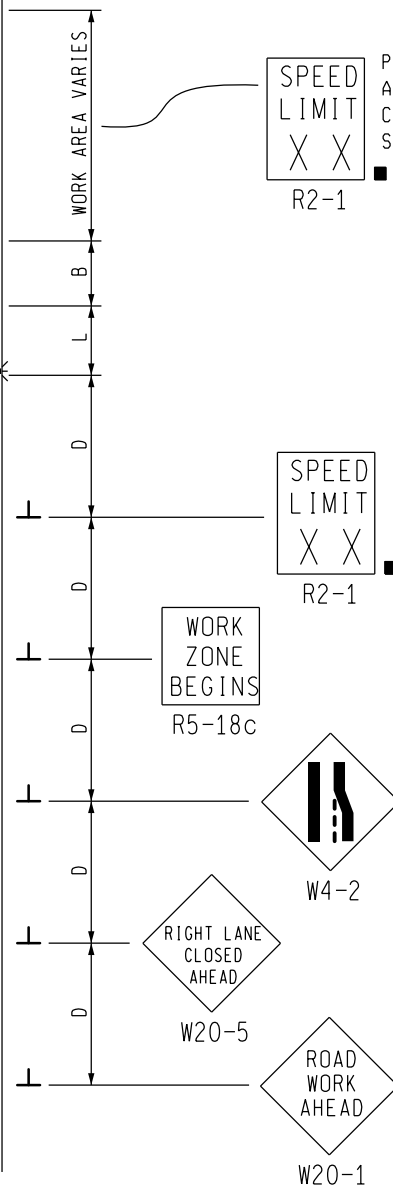
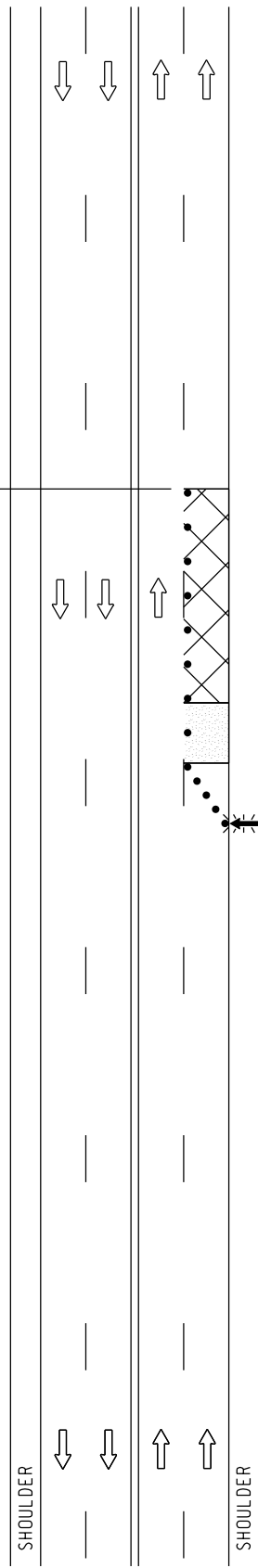
PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.



PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.



PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



MDOT
Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC
TYPICAL

TYPICAL TEMPORARY TRAFFIC CONTROL
FOR A ONE-LANE CLOSURE ON AN
UNDIVIDED MULTI-LANE ROADWAY,
NO SPEED REDUCTION

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0240a	SHEET 1 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0240a.dgn REV. 10/11/2011			

NOT TO SCALE


NOTES

- 1B. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
L = MINIMUM LENGTH OF TAPER
B = LENGTH OF LONGITUDINAL BUFFER
SEE M0020a FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
21. ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS, SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR DAYTIME-ONLY TRAFFIC PATTERNS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.
26. THE LIGHTED ARROW PANEL SHALL BE LOCATED AT THE BEGINNING OF THE TAPER AS SHOWN. WHEN PHYSICAL LIMITATIONS RESTRICT ITS PLACEMENT AS INDICATED, THEN IT SHALL BE PLACED AS CLOSE TO THE BEGINNING OF THE TAPER AS POSSIBLE.

SIGN SIZES

DIAMOND WARNING - 48" x 48"
R2-1 REGULATORY - 48" x 60"
R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 MDOT Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A ONE-LANE CLOSURE ON AN UNDIVIDED MULTI-LANE ROADWAY, NO SPEED REDUCTION		
	DRAWN BY: CON:AE:djf	OCTOBER 2011	M0240a
CHECKED BY: BMM:CRB	PLAN DATE:	2 OF 2	
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0240a.dgn REV. 10/11/2011			

SECTION 02950

TREES, PLANTS, AND GROUND COVER

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. Preparation of subsoil and topsoil.
- B. Topsoil bedding.
- C. New installation and Relocation of trees, plants, and ground cover.
- D. Mulch and fertilizer.
- E. Maintenance.

1.2 RELATED SECTIONS

- A. Section 02200 – Earthwork.
- B. Section 02970 – Landscape Maintenance and Guarantee Standards.

1.3 MAINTENANCE DATA

- A. Submit required information for planting maintenance under provisions of 02970.

1.4 QUALITY ASSURANCE

- A. Certification: - The contractor shall be responsible for all certificates of inspection of plant materials required by Federal, State or other authorities. Copies of these certificates shall be filed with the Owner. All plant materials shall comply with sizing and grading standards of the latest edition of “American Standard for Nursery Stock”. A plant shall be dimensioned as it stands in its natural position.
- B. Selection: - All trees and shrubs required by contract shall be tagged at the source prior to digging and shipment. It shall be the contractor's responsibility to see that this is done, and to notify the Owner of the location(s) of such material prior to digging. The Owner will have the option to inspect all material at the source, regardless of location, and to reject any plants that do not meet with his approval.
- C. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of two (2) years.
- D. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable, at no additional cost. Larger plants shall not be cut back to size indicated.

1.5 QUALIFICATIONS

- A. Nursery: Company specializing in growing and cultivating the plants with five years documented experience working on projects of a similar type.
- B. Contractor: Company specializing in installing, planting and maintaining the plants with five years documented experience and approved by nursery.

1.6 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer composition, rates and application periods.
- B. Provide certificate of compliance from all authorities having jurisdiction indicating approval of plants and fertilizer mixture.
- C. Plant Materials: Certified by federal and state department of agriculture to be free of disease or hazardous insects.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Dig, pack, transport and handle plants with care to ensure protection against injury law.
- B. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss or in a manner acceptable to the Engineer. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- C. All shrubs shall be bound and secured by twine to protect against broken branches. Twine shall be removed after planting.

1.8 COORDINATION

- A. Contractor shall coordinate his work with other site improvements.

1.9 WARRANTY

- A. The contractor shall guarantee that all plants are true to botanical name and that the quality and size meet specifications, as are required herein.
- B. The contractor shall fully guarantee that all plants are in a vigorous growing condition during and at the end of the guarantee period. The guarantee period shall expire one (1) year from the date of acceptance by the Owner.
- C. The contractor shall replace plants that do not meet these specifications or ones that have lost their natural shape due to dead branches excessive pruning, or inadequate or improper contractor maintenance. All plants rejected shall be removed from the site and legally disposed of by the contractor at no additional cost to the Owner.

- D. Replacement plants and planting operations shall be in accordance with the original specifications. All costs for such replacements shall be considered to be included in the bid price. Replacement planting shall be completed no later than the next succeeding planting season. All replacement plants shall be guaranteed for an additional period of one (1) year. All areas damaged by replacement operations shall be fully restored by the contractor to their original and/or specified condition.
- E. The contractor shall not assume responsibility during the guarantee period for damages resulting from natural causes such as floods, lightning storms, freezing rains or winds over 60 miles per hour. The Contractor will also not be held responsible for damages resulting from acts of negligence on the part of the Owner or others occupying the site, fire or vandalism.

1.10 MAINTENANCE SERVICE

- A. Maintenance of trees, shrubs and ground covers by the contractor consists of pruning, keeping guys taut and trees erect, raising tree balls which settle below grade, fertilizing and weekly irrigation until acceptance by the Owner.
- B. General maintenance, including weekly irrigation throughout the remainder of the growing season, shall be accomplished by the Owner's personnel following the initial maintenance requirements as noted above.
- C. At the end of this period of initial maintenance, the Owner will accept the various portions of the work, provided the requirements of the specifications have been fulfilled.
- D. It shall be the contractor's responsibility to conduct monthly inspections and advise the Owner of watering excesses or deficiencies during the guarantee period.
- E. Additional maintenance to include:
 - 1. Cultivation and weeding plant beds and tree pits.
 - 2. Applying herbicides for weed control, as required in accordance with manufacturer's instructions. Remedy damage resulting from use of herbicides.
 - 3. Remedy damage from use of insecticides.
 - 4. Disease control.

PART 2 PRODUCTS

2.1 ACCEPTABLE NURSERIES

- A. Refer to Section 02958 for any special requirements.

2.2 TREES, PLANTS, AND GROUND COVER

- A. Refer to the Plant List on the drawings for plant materials that are required, or the list of suitable trees contained herein.
 - 1. Quality and Size: Plant materials shall have a habit of growth that is normal for the species, shall conform to the sizes given in the Plant List, shall be sound, vigorous and free from plant diseases, insects and their eggs.

2. All plants shall have a normal and healthy root system, as designated by horticultural standards. All standards, i.e., quality designations and measurements (ball sizes, heights and caliper of plants) shall be in accordance with the latest edition of "American Standards for Nursery Stock." This booklet is available from the American Associate of Nurserymen, Inc., 835 Southern Bldg., Washington D.C. 20005.
3. Root Protection: Plants designated "B & B" in the Plant List shall be balled and burlapped. They shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root systems necessary for full recovery of the plant. Balls shall be securely wrapped with burlap and bound with cord. No balled and burlapped plant shall be planted if the ball is cracked or broken.

2.3 PLANTING MIXTURE

- A. Planting mixture is the material which is used for placement within the planting hole and around the earth balls in the process of planting.
- B. It shall be prepared on the site by mixing two parts topsoil, two parts soil excavated from the pit, and one part peat. Five (5) pounds of Superphosphate shall be added to each cubic yard of planting mixture.
 1. PEAT
 - a. Peat shall be granulated raw peat or baled peat and shall be essentially brown to black in color.
 2. SUPERPHOSPHATE
 - a. Superphosphate, as is commonly used for agricultural purposes, shall be used and will contain approximately 20% available phosphoric acid.

2.4 MULCH AND OTHER PLANTING MATERIALS

- A. Shredded Hardwood Bark Mulch: Clean, free of debris and sticks, and well aerated. Materials shall be uniform in size, shape and texture. Submit samples to the Owner prior to installation. Install mulch to finish grade, level smooth, without ridges, humps or depressions.
- B. Stakes for Staking: Hardwood, 2" x 2" x 6'-0" minimum length. Stakes for Guying: Hardwood, 2" x 2" x 36" long. Guying/Staking Wire: No. 10 or 12 gage galvanized wire. For large trees use turnbuckles and heavier gage wire. Staking and Guying Hose: Two-ply, reinforced garden hose not less than ½" inside diameter.
- C. Tree Wrap: Standard waterproofed tree wrapping paper, 2 ½" wide, made of 2 layers of crepe Kraft paper weighing not less than 30 lbs. per ream, cemented together with asphalt.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that site is ready to receive work.

3.2 EXCAVATION

- A. Circular pits with vertical sides shall be excavated for all plants. Ensure that the specified irrigation system is installed and is functioning prior to plant pit excavation. Protect installed irrigation system from damage from planting operations.
- B. Diameter of all plant pits shall be at least one (1) foot greater than the diameter of the ball.
- C. Depth of pits shall be enough to accommodate the ball of B & B material in the manner shown on the planting detail drawing.
- D. The earth in the bottom of the pits shall be loosened by spading or other approved means, to a depth of four (4) inches.
- E. Planting plants within all Planter Boxes or tree grate pits will require that all soil within the planter box or under the tree grate be of the specified plant mix as specified in section 2.3 of this specification section. All placed plant mixture shall be compacted to ensure minimal soil settling upon completing of all plantings. Compact soil mixture in layers not to exceed 12 inches in depth to ensure proper stability for newly planted trees and shrubs.

3.3 PLANTING

- A. All planting, unless otherwise directed, shall be performed as herein stated.
 - 1. Plants shall be set in the planting pit to the proper grade and position. Set plants upright and face to give the best appearance or relationship to each other or adjacent structures. Planting mixture, as specified, shall then be carefully worked around the ball or roots until approximately 2/3 of the planting pit has been backfilled. At this time, trees and shrubs with balled roots shall have burlap and straps cut away and folded back from the top of the balls. The remaining portion of the planting pit can then be filled with planting mixture and tamped to grade. Note: Planting mixture in a frozen or muddy condition shall not be used for backfill.
 - 2. Water is to be worked around the balls during or immediately after the plants have been backfilled. The entire ball area of each plant shall be soaked and the backfill solidly worked in and settled around the plants.

3.4 PLANT RELOCATION AND RE-PLANTING

- A. Re-locate plants as indicated on the contract Drawing.
- B. Re-plant plants in pits or beds, partly filled with prepared topsoil mixture, at a minimum depth of 6 inches under each plant. Loosen burlap, ropes, and wires, from the root ball.
- C. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant materials in vertical position.
- D. Saturate soil with water when the pit or bed is half full of top soil and again when full.

3.5 GUYING AND STAKING

- A. All trees shall be guyed and staked immediately after planting.

- B. Work shall be done as illustrated in the planting detail drawing.
- C. Trees shall be guyed securely with pliable, zinc coated iron or steel wire No. 10 gauge and covered at contact with the tree with dark fabric rubber hose.
- D. No eye bolts or nails are to be driven into the tree.
- E. Trees shall be secured by two double twisted wire guys secured to two 3" diameter cedar posts set four (4) feet into the ground and standing a minimum of 4'-5' above grade.

3.6 MULCHING AND WATERING

- A. All plants shall be mulched with cover 4" in depth.
- B. This cover shall extend in all directions to 12" past the excavated hole.
- C. After mulching, all plants shall be thoroughly watered.

3.7 PRUNING AND REPAIR

- A. Upon completion of work, all plants shall have been pruned and injuries repaired.
- B. The amount of pruning shall be limited to the minimum necessary to remove dead or injured twigs or branches, remove badly formed and interfering limbs only.
- C. Pruning shall be done so as not to change the natural habit or shape of the plant.
- D. All cuts shall be made flush to the branch collar, leaving no stubs.
- E. All pruning shall be done by workmen experienced in this type of work and during the appropriate pruning season.

3.8 FINAL APPROVAL

- A. All planted material shall be subject to final approval by the Owner's representative after completion of all phases of the contractor's work.
- B. Materials that do not meet specifications as listed herein or material that has been damaged due to shipment or installation may be rejected.
- C. Acceptable replacements for rejected plants will be made, at no cost to the Owner.
- D. Ensure operation of specific irrigation system.

3.9 CLEAN-UP

- A. Upon completion of the work, or any portion thereof, the ground shall be cleared of all debris and of all other superfluous materials resulting from landscape development.

3.10 SCHEDULE - PLANT LIST

- A. Refer to Contract Drawings for Plant Lists for Plant Materials that are required.

END OF SECTION

SECTION 02970

LANDSCAPE MAINTENANCE AND GUARANTEE STANDARDS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work specified in this section.

1.2 DESCRIPTION

- A. The requirements of this section include a one-year warranty period from date of final inspection performed by the Owner or their representative.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02950: Trees, Plants and Ground Cover

1.4 PROJECT WARRANTY

- A. Warranty seeded or sodded areas through specified maintenance period.
- B. Warranty trees, plants and shrubs, for a period of one year after date of substantial completion, against defects including death and unsatisfactory growth, except for defect resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Installer's control.
- C. Based upon the opinion of Owner or their representative, all plants found dead or unhealthy shall be removed and replaced.
- D. Based upon the opinion of Owner or their representative, all plants in doubtful condition shall be removed and replaced or shall have an extended warranty period.
- E. The extended warranty period is one full-growing season.
- F. At the end of the extended warranty period all plants found dead, unhealthy, or in doubtful condition shall be removed and replaced, based upon the opinion of the Owner or their representative.
- G. Make replacements during growth season following end of warranty or extended warranty season.
- H. Only one replacement will be required at the end of the warranty or extended warranty period, except for losses or replacements due to failure to comply with specified requirements.

1.5 MAINTENANCE

- A. Begin maintenance immediately after planting.
1. Maintain trees, plants and shrubs until final acceptance.
 2. The Contractor shall be responsible for watering all plantings through the maintenance period and shall keep guy wire taut, raise tree balls which settle, furnish and apply sprays as necessary to keep the plantings free of disease and furnish and apply sprays as necessary to keep the plantings free of disease and insects until the end of the warranty period. All evergreens shall be watered thoroughly in the Fall to insure they do not go into the Winter dry. Arrange with Owner or their representative to walk the site monthly during maintenance period to review maintenance standards. Remove all stakes, guy wires, tree wrap paper, dead twigs and branches from tree and plant materials at the end of this maintenance warranty period.
- B. Maintain Seeded Grass Areas
1. The Contractor shall establish a dense lawn of permanent grasses, free from lumps and depressions or any bare spots, none of which is larger than one foot of area up to a maximum of 3% of the total seeded lawn area. Any part of the seeded lawn that fails to show a uniform germination shall be reseeded until a dense grass cover is established.
 2. The Contractor shall water and provide a minimum of two cuttings of the lawn or more as necessary until the final inspection and acceptance of the seeded lawn area by the Owner or their representative. When the lawn reaches 3 inches in height it shall be cut to 2" inches in height.
 3. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance following spring until acceptable lawn is established.
 4. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading, replanting, and applying herbicides, fungicides, insecticides as required to establish a smooth, acceptable lawn, free of eroded or bare areas.
 5. Water as required to maintain adequate surface soil moisture for proper seed germination. Continue watering as required for not less than 30 days. Thereafter apply 1/2" of water twice weekly until acceptance. When irrigation is not present, seeding should take place in early spring or fall.
 6. Repair, rework, and re-seed all areas that have washed out, are eroded, or do not catch.
- C. Maintain Sodded Grass Areas
1. Maintain sodded lawn areas, including watering, spot weeding, mowing, application of herbicides, fungicides, insecticides, and resodding until a full, uniform stand of grass free of weed, undesirable grass species, disease, and insects is achieved and accepted by the Owner or their representative.
 2. Water sod thoroughly every 2 to 3 days, as required to establish proper rooting.
 3. Repair, rework and resod all areas that have washed out or are eroded. Replace undesirable or dead areas with new sod.
 4. Mow lawn areas as soon as lawn top growth areas a 3" height. Cut back to 2" height. Repeat mowing as required to maintain specified height. Not more than 40% of grass shall be removed at any single mowing.

5. The Contractor shall water and provide a minimum of two cuttings of the lawn or more as necessary until final inspection and acceptance of seeded lawn areas by the Owner or their representative.
 6. Provide a uniform stand of grass by watering, mowing, and maintaining lawn areas until final acceptance. Resod areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Owner or their representative.
 7. Sodded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, even colored viable lawn is established, free of weeds, undesirable grass species, disease, and insects.
- D. Inspection and Final Acceptance
1. When landscape work is completed, including maintenance, Owner or their representative will, upon request, make a final inspection to determine acceptability.
 2. Landscape work may be inspected for acceptance in parts agreeable to Owner or their representative provided work offered for inspection is complete, including maintenance.
 3. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Owner or their representative and found acceptable. Remove rejected plants and materials promptly from project site.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

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. SP_Reimbursed Permit Fees

1.3 PERMIT

- A. The following permits are contained hereinafter with costs to the Contractor noted.
 - 1. RCOC – Right of Way Permit

END OF SECTION

NOTICE TO BIDDERS

MDOT REFERENCES

HRC

1 of 1

September 5, 2018

Specifications and Contract Pay Items

These specifications form a part of the contract documents for the 2023 Sidewalk Improvement Program with the requirements contained within this spec book. Pay items not addressed within this spec book shall be in accordance with the MDOT 2020 Standard Specifications for Construction.

Frequently Used Special Provisions, Notice to Bidders and Supplemental Specifications

When a pay item is not addressed within this spec book, and it is built in accordance with the MDOT 2020 Standard Specifications for Construction, all appropriate Notice to Bidders, Frequently Used Special Provisions and Supplemental Specifications shall apply. All references to the "Department" in the Michigan Department of Transportation 'Notice to Bidders', 'Frequently Used Special Provisions' and 'Supplemental Specifications', which apply, but are not included in these specifications, shall indicate a reference to the City of Wixom.

CITY OF WIXOM
SPECIAL PROVISION
FOR
SIDEWALK, BRICKWORK, REM

HRC

1 of 1

2-23-23

Description

This work consists of furnishing labor and equipment necessary to remove, salvage and deliver approximately 50 bricks for the City DPW and 200 bricks to owner of the Klebba building. The DPW bricks are to be delivered to the City of Wixom DPW yard (located at 2041 Charms Road) and the Klebba bricks are to be stacked neatly onsite (at a location approved by the Engineer) for pick up by owner. The remainder of the bricks, including the existing planter boxes, are the property of the contractor and are to be removed from the site and properly disposed of. The work also includes the removal and disposal of excess associated material necessary to complete the work.

Materials

Materials shall be as required by Section 204 of the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans.

Construction Methods

Construction shall be as required by Section 204 of the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans.

Carefully remove the existing bricks so they can be salvaged and delivered as stated above. Bricks that are in excess of the 300 stated above and/or damaged that are not reusable, must be properly disposed of in accordance with the standard specifications.

Measurement and Payment

The completed work, as described, will be measured, and paid for at the contract unit price using the following pay item:

Pay Item

Pay Unit

Sidewalk Brickwork, Rem, SpecialSquare Foot

Sidewalk, Brickwork, Rem, Special includes furnishing all labor and equipment necessary to complete the work as described.

CITY OF WIXOM
SPECIAL PROVISION
FOR
STATION GRADING

HRC

1 of 1

2-23-23

Description

This work shall consist of constructing earth grades by excavating, removing vegetation and topsoil, removing gravel, furnishing and placing embankments or fill and all grading operations to shape the subgrade to the finish grade and cross-sections shown on the plans for the sidewalk within the project limits. Work shall include removal and disposal of all plants in the existing planter boxes.

Materials

Materials shall be as required by Section 205 of the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans.

Construction Methods

Construction methods shall conform to the requirements of Section 205 and Section 806 of the MDOT 2020 Standard Specifications for Construction and/or as specified herein.

Excavated material in excess of plan requirements, unsuitable excavated material, gravel, debris, pavements, etc., shall be disposed of properly at the Contractor's expense. Excess excavated material may be used as embankment in special circumstances and as approved by the engineer. Excess topsoil material may be spread throughout the restoration areas and as approved by the engineer.

The finished subgrade shall be compacted to at least 95% maximum unit weight. The Engineer will require that the Contractor proof roll the subgrade prior to placement of granular material base.

Measurement and Payment

The completed work as measured for Station Grading, Special will be paid for at the contract unit price for the following contract pay items:

Pay Item

Pay Unit

Station Grading, SpecialStation

Station Grading, Special will be measured along the centerline of the path and will be paid for at the contract unit price station (100 foot lengths per station); which price shall be payment in full for all labor, equipment and materials, including all necessary grading and embankment material needed to accomplish this work to establish the proposed top of sidewalk grade for limits shown on plans, including step.

All miscellaneous excavation and embankment as determined by the Engineer shall be included in the pay item Station Grading, Special and will not be paid for separately.

CITY OF WIXOM
SPECIAL PROVISION
FOR
AGGREGATE BASE

HRC

1 of 1

2-23-23

Description

This work shall consist of installing Aggregate Base per the details shown in the plans. The work shall be performed according to Section 302 of the 2020 Standard Specifications for Construction, except as herein specified.

Materials

The material shall meet the requirements specified in Tables 902-1 and 902-2 of the 2020 Michigan Department of Transportation Standard Specifications for Construction.

Materials shall be MDOT 21AA, compacted to the cross-section indicated on the Plans.

Limestone, Crushed concrete or natural aggregate can be used.

Construction Methods

This work shall consist of installing Aggregate Base per the plans and includes all material, labor and equipment used in the preparation of the base, furnishing all material, grading and compacting the material to proper finished elevations, and protecting the subgrade, sub base, and base.

Measurement and Payment

Aggregate Base will be paid for at the Contract unit price per square yard for the thickness specified which includes all work indicated in this Special Provision and related Contract References.

Pay Item

Pay Unit

Aggregate Base, _ inch, 21AA, Special..... Square Yard

Payment for **Aggregate Base, _ inch, 21AA, Special** shall include all labor, equipment, and materials required to complete the work described to a final compacted total depth as indicated for the proposed work.

CITY OF WIXOM
SPECIAL PROVISION
FOR
CURB AND GUTTER

HRC

1 of 1

2-23-23

Description

This work shall consist of installing concrete curb and gutter at locations called for in the plans and as-directed by the Engineer. This work shall be done in accordance with Section 802 of the 2020 Michigan Department of Transportation Standard Specifications for Construction, except that the curb and gutter shall match the detail on the standard details in the plans or match the existing width, height, type that exists in the field today.

Materials

Materials shall be as required by Section 802.02 of the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the detail sheets in the plans.

Construction Methods

Construction shall be as required by Section 802.03 of the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the detail sheets in the plans.

Measurement and Payment

Payment for this item shall be according to the Contract unit price per foot installed.

Pay Item

Pay Unit

Curb and Gutter, Conc, Match Existing, Special.....Foot

Payment for above item includes equipment, labor and materials to install this item in accordance with the plans and this special provision.

CITY OF WIXOM
SPECIAL PROVISION
FOR
BENCH, SPECIAL

HRC

1 of 1

2-23-23

a. Description. This work shall consist of providing, locating and installing **Bench, Special**, with all appurtenant items listed.

b. Material. The **Bench, Special** shall be 6' long with redwood color recycled plastic slats and a black steel frame coated with zinc rich epoxy and finished with a black polyester powder coating. The end armrests shall be circular. The **Bench, Special** shall be gull-wing surface mounted and include a center armrest. All steel shall be Buy America certified.

1. Dumor Inc, 6' Bench (#66-009-6PR3AR)

c. Construction. **Bench** placement to be field located and approved by the Engineer. All Benches are to be installed on top of concrete pavement using stainless steel expansion anchor bolts with vandal resistant heads, sized per Bench manufacturer.

d. Measurement and Payment. The completed work as measured for **Bench, Special** shall be paid for at the contract unit price for the following contract item (pay item):

Pay Item	Pay Unit
Bench, Special	Each

Bench, Special shall be measured in place by the unit Each and paid for at the contract unit price per Each, which price shall be payment in full. Payment for **Bench, Special** shall include all shipping, storage, assembly, hardware and all other materials, labor, and equipment required to install **Bench, Special** in accordance with this specification and manufacturers recommendations. Concrete pavement to be paid for separately.

CITY OF WIXOM
SPECIAL PROVISION
FOR
BIKE RACK, SPECIAL

HRC

1 of 1

2-24-23

a. Description. This work shall consist of providing, locating and installing a single loop style **Bike Rack, Special**, and all appurtenant items, as listed herein, and as directed by the Engineer.

b. Materials. The **Bike Rack, Special** shall be a 35 ½” tall black loop finished with polyester powder coating. The **Bike Rack, Special** shall be surface mounted.

1. DuMor Inc. (# 67-705/ S-2 LOOP BIKE RACK)

c. Construction. Placement of Bike Rack to be field located and approved by the Engineer and is to be installed on top of concrete pavement of using stainless steel expansion anchorbolts with vandal resistant heads, sized per manufacturer.

d. Measurement and Payment. The completed work as measured for **Bike Rack, Special** shall be paid for at the contract unit price for the following contract item (pay item):

Pay Item	Pay Unit
Bike Rack, Special	Each

Bike Rack, Special shall be measured in place by the unit Each and paid for at the contract unit price per Each, which price shall be payment in full. Payment for **Bike Rack, Special** shall include all shipping, storage, assembly, hardware and all other materials, labor, and equipment required to install **Bike Rack, Special** in accordance with this specification and manufacturers recommendations.

Concrete pavement to be paid for separately.

CITY OF WIXOM
SPECIAL PROVISION
FOR
TRASH RECEPTACLE, SPECIAL

HRC

1 of 1

2-23-23

a. Description. This work shall consist of installing **Trash Receptacle, Special**, and all appurtenant items.

b. Material. The **Trash Receptacle, Special** shall be 36” tall with a 31-gallon capacity, redwood color recycled plastic slats and steel frame coated with a zinc rich epoxy then finished with black polyester powder coating. The cover shall be a dome cover with self-closing door. The **Trash Receptacle, Special** shall be surface mounted.

1. DuMor Inc. (#124-31 PLR 31 GAL RECEPT, RWD PL 244 244)

c. Construction. **Trash Receptacle, Special** placement to be field located and approved by the Engineer. All trash receptacles are to be placed on top of concrete pavement.

d. Measurement and Payment. The completed work as measured for **Trash Receptacle, Special** shall be paid for at the contract unit price for the following contract item (pay item):

Pay Item	Pay Unit
Trash Receptacle, Special	Each

Trash Receptacle, Special shall be measured in place by the unit Each and paid for at the contract unit price per Each, which price shall be payment in full. Payment for **Trash Receptacle, Special** shall include all shipping, storage, assembly, hardware and all other materials, labor, and equipment required to install **Trash Receptacle, Special** in accordance with this specification and manufacturer’s recommendations.

Concrete pavement to be paid for separately.

CITY OF WIXOM
SPECIAL PROVISION
FOR
TREE GRATE WITH TREE GUARD, SPECIAL

HRC

1 of 2

2-24-23

a. Description. This work consists of furnishing and installing cast iron tree grates, their frames and tree guards. Each tree grate must be 36” x 48” by 1 inch minimum thickness with a minimum sized 16” square opening that can be expanded to 24” square.

b. Materials. Provide tree grates, frames and guards of gray cast iron in accordance with section 908 of the Standard Specifications for Construction and conforming to *ASTM A 48, Class 35* or better. Ensure all castings are patterned with slot openings in accordance with *Public Rights of Way Accessibility Guidelines* (PROWAG) pedestrian requirements. Ensure grates are notched in underside ribs for ease of expanding the tree opening. All tree grate castings must be manufactured true to pattern and component parts must fit together in a uniform manner. Castings must be free of all defects and cleaned by shot blasting. Furnish tree grates, frames and guards with black powder coat finish and frames without paint or primer. Ensure all anchoring bolts, nuts, washers, and all other hardware for installation are galvanized or zinc coated.

Submit complete shop drawings for approval by the Engineer in Portable Document Format (PDF) that allows commenting. Do not purchase any material until approval of the shop drawings has been received from the Engineer.

1. Tree Grate. Provide gray iron castings with frames that come with a 10-year warranty against breakage. Tree grates must be one of the following or an approved equal:

<u>Product Name</u>	<u>Supplier</u>	<u>Telephone No.</u>
Custom 36”x48”	Iron Smith	614-354-5605
	Neenah Foundry	920-725-7000
	Urban Accessories	866-802-5221

2. Tree Guard. Provide gray iron castings that come with a 10-year warranty against breakage. Tree grates must be one of the following or an approved equal:

<u>Product Name</u>	<u>Supplier</u>	<u>Telephone No.</u>
M3	Iron Smith	614-354-5605
	Neenah Foundry	920-725-7000
	Urban Accessories	866-802-5221

c. Construction.

1. Frames. Square up the frame sections and bolt them together. Install the tree grate frame on a plane with the proposed surrounding slope and cast the surrounding concrete around it.

2. Tree Grates. Set the grates flush with the top of the frame and ensure that the grate does not rock in the frame. Securely bolt grates halves together on the underside. Clean any foreign matter from the grates prior to setting.

3. Tree Guards. Install per manufacturer.

4. Spot weld the grates to the frame sections upon placement. Provide a 1 inch weld at a minimum of three locations centered on each side of each tree grate section adjacent to the pavement edge. Locate the weld in inconspicuous locations and coordinate with the design/pattern of the tree grate to minimize disturbance to the aesthetic appearance.

5. When requested by the Engineer, the Contractor must furnish certification regarding the compliance of materials incorporated in the work.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items

Pay Item	Pay Unit
-----------------	-----------------

Tree Grate with Tree Guard, Special	Each
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Tree Grate with Tree Guard, Special includes all labor, materials and equipment required to furnish and place the new frame, tree grate and tree guard.

Concrete pavement for anchoring frame to be paid for separately.

CITY OF WIXOM

SPECIAL PROVISION
FOR
TURF ESTABLISHMENT

HRC

1 of 3

February 10, 2022

a. Description. This work consists of providing all labor, equipment and materials necessary to shape and restore all disturbed lawn areas as directed by Engineer. Perform work in accordance with section 816 and 917 of the Standard Specifications for Construction and Standard Plan R-100 Series, except as modified by this special provision or as directed by the Engineer.

b. Materials. The materials and application rates specified in sections 816 and 917 of the Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer.

1. Seeding Mixture. The seeding mixture will be composed of certified seed of the purity, germination and proportions by weight, as specified in Table 1 below:

Table 1: Required Seeding Mixture

Kind of Seed	Min. Purity	Min. Germination	Mixture
Kentucky Bluegrass(a)	98%	85%	25%
Perennial Ryegrass(b)	96%	85%	25%
Hard Fescue(c)	97%	85%	25%
Red Fescue(d)	97%	85%	25%
a. The Kentucky Bluegrass in the mixture will be equal parts of any two of the following varieties: Eagleton, Liberator, Cabernet and Bluedevil.			
b. The Perennial Ryegrass in the mixture will be the following variety: Palmer III, Premium.			
c. The Hard Fescue in the mixture will be the following variety: Rescue 911, Sword, Gibraltar.			
d. The Red Fescue in the mixture will be the following variety: Audubon, Kent.			

2. Seeding Rate. The seeding rate must be 250 lbs/acre.

3. Topsoil, Furnished. Provide topsoil that is at least 4 inches in depth of natural/clay loam humus bearing soils adapted to the sustenance of plant life, neither excessively acid or alkaline (pH between 6.0 and 7.2). Topsoil will be screened, friable with an organic content between 5 percent and 10 percent, capable of sustaining vigorous plant growth and free of sub-soil, weeds, seeds, foreign debris and stones larger than 1/2 inch.

4. Fertilizer. Chemical Fertilizer Nutrient, Class A must be used on this project applied at a rate 228 pounds per acre evenly applied.

5. 90 Day degradable Mulch Blanket or Bonded Fiber Matrix (BFM) must be used on this project.

6. Mulch Blanket must be installed in accordance with Section 816 of the 2020 Standard Specifications for construction.

7. BFM consists of long strand, virgin wood fibers (90 percent by weight) and bound together by a pre-blended, high strength poly-saccharine polymer adhesive (10 percent by weight). The virgin

wood fibers must be thermo-mechanically defiladed from clean whole wood chips, containing a minimum of 25 percent of the fibers averaging 7/16 of an inch long, with a minimum of 50 percent or more retained on the No. 25 sieve size. The organic binders must be a high viscosity colloidal polysaccharine tackifier (4000 centipoise) with activating agents to render the resulting matrix insoluble upon drying.

c. Construction. Turf Restoration shall not exceed beyond fourteen (14) calendar days of the completion of the sidewalks being placed. It may be necessary, as directed by the Engineer, to place materials by hand.

Shape and prepare all areas to be seeded with topsoil 4 inches in depth in accordance with section 816 of the Standard Specifications, except as modified herein under Section b3 - Materials.

Apply seed mixture and fertilizer to prepared surface prior to mulching in accordance with Section 816 of the Standard Specifications at the purity and rates contained within this special provision. Seeding and mulch blanket or BFM must be completed within two (2) days of topsoil placement. Seasonal limitations in accordance with Section 816 of the Standard Specifications will apply.

Apply Mulch Blanket or BFM.

BFM shall be applied hydraulically at a minimum rate of 4000 pounds per acre unless dormant seeding which requires a rate of 6000 pounds per acre or greater if specified by the manufacturer or as directed by the Engineer for the specific site conditions.

BFM slurry must be applied in successive layers, from two or more directions, to fully cover 100 percent of the soil surface.

Do not apply on saturated soils or immediately before, during or after rainfall in accordance with the manufacturer’s recommended timeframe for application for such conditions.

If an area washes out after the seeding and mulching or BFM has been completed and accepted by the Engineer and is the result of a storm, the contractor will be required to make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed and mulch blanket or BFM. This replacement will not be paid for as extra work.

The contractor will be required to water in accordance with section 816.03 daily at a rate of 3.5 gallons/square yard by natural or manual means to keep the surface moist until substantial growth has taken place.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Turf Establishment, Special.....	Square Yard

Turf Establishment includes all labor, equipment and materials required to complete the work as described. Contractor will be paid 50% of work when the initial seeding is completed and remaining 50% when all provisions of this special provision is completed.

When Turf Restoration work is completed, Engineer will, upon request, make a final inspection prior to transferring the responsibility to the owner for assuming those areas for completion and watering.

CITY OF WIXOM
SPECIAL PROVISION
FOR
AUDIO/VIDEO ROUTE SURVEY

HRC

1 of 3

February 23, 2023

Description

Provide a film record of physical, structural and aesthetic conditions of the entire project as shown on the plans prior to the beginning of any construction activities. Because of the confined working area and close proximity of the work to existing buildings, the film must be professional quality, providing a clear and accurate visual and audio record of existing conditions including all building faces, foundations, steps, stairwells, etc. Once completed, the video must be turned into the Owner for review and approval. Any recorded coverage not acceptable to the Owner shall be re-filmed at no additional charge. The Owner shall have the authority to designate areas for which coverage may be added and this shall be considered as incidental to the Contract. ***Construction cannot begin until the video is approved by the owner.***

Materials

None Specified.

Construction

- A. The bid item “Audio/Video Route Survey, Special” is included in the proposal to cover the cost of obtaining a record of the existing conditions prior to the start of construction.
- B. The Contractor shall engage the services of a professional electrographer actively engaged in color audio-video recordings of projects similar to the work included under this Contract.
- C. The firm performing this work shall have the equipment and experience necessary to produce a digital color audio-video recording of the prescribed quality, meeting all of the requirements specified herein.
- D. The Engineer may require the video taping of a “sample” route to verify the ability of the electrographer to perform the work.
- E. All digital recordings and written records shall become the property of the Owner. The firm performing this work shall also provide one complete copy of all written records to the Engineer on a USB flash drive.
- F. Complete coverage shall include all surface features located within the public right-of-way, easement areas and adjacent private properties up to building line when such properties lie within the zone of influence of construction and will be supported by appropriate audio descriptions made simultaneously with video coverage. Such coverage shall include but not be limited to all existing driveways, sidewalks, curbs, ditches, roadways, landscaping, trees, culverts, mail boxes, headwalls, and retaining walls, or buildings located within such zone of influence.
- G. Coverage shall include the entire project area impacted by construction and any portions of streets to be used by the Contractor as access roads and/or haul roads.

- H. When conventional wheeled vehicles are used, the distance from the camera lens to the ground shall not be less than twelve (12) feet to insure proper perspective.
- I. In some instances, audio-video coverage will be required in areas not accessible by conventional wheeled vehicles. Such coverage shall be obtained by walking or special conveyance approved by the Owner.
- J. All recording must be made using digital equipment in full color audio-video. Two (2) complete copies of the digital video and written records shall be provided to the Owner on two (2) separate USB flash drives prior to commencing construction on this project.
- K. Buildings shall be identified by street number, when visible, in such a manner that structures of the proposed system can be located by reference. In all instances, however, locations shall be identified by audio or visual means at intervals not-to-exceed 100 lineal feet in the general direction of travel.
- L. The rate of speed in the general direction of travel of the conveyance used during recording shall not exceed 30 feet/minute. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that stop-action during play-back will produce clarity of detail in the object viewed.
- M. All recording shall be done during times of good visibility. No recording shall be done during periods of visible precipitation, or when more than 10% of the ground area is covered with snow or standing water, unless otherwise authorized by the Owner.
- N. Any recorded coverage not acceptable to the Owner shall be rerecorded at no additional charge.
- O. The Owner shall have the authority to designate areas for which coverage may be added or omitted and this shall be considered as incidental to the Contract.
- P. All USB flash drives shall be properly identified as to location, time and date in a manner acceptable to the Owner.
- Q. A record of the contents of each USB flash drive shall be supplied by a sheet identifying each segment on the USB flash drive by location, disc number, disc time, starting point, traveling direction and ending point.
- R. The recording shall be done prior to placement of materials or equipment on the construction area and the USB flash drive and record of contents must be furnished one week prior to the start of construction.
- S. To preclude the possibility of tampering or editing in any manner, all video recordings, must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording, as well as the corresponding engineering stationing numbers. The date information will contain the month, day and year; for example 10/5/96 and be placed directly below the time information. The time information shall consist of hours, minutes and seconds, separated by colons. For example 10:53:18. This transparent information will appear on the extreme upper left-hand third of the screen.

- T. The engineering stationing numbers must be continuous, accurate and correspond to the project stationing and must include the standard engineering symbols. For example 14+84. This transparent information will appear on the extreme area covered, direction of travel, viewing side, etc.
- U. Below the engineering station, periodic transparent alpha/numeric information will appear. This information will consist of the name of the project, name of area covered, direction of travel, viewing side, etc.
- V. Digital audio-video discs must be originally recorded with minimum horizontal resolution of 480 lines.
- W. In order to produce the proper detail and perspective, artificial lighting will be required where it is necessary to fill in shadow areas caused by trees, utility poles, road signs, or other such objects.

Measurement and Payment

The completed work as documented by the digital audio video disc(s) will be paid for at the contract unit price for the following pay item.

Pay Item	Pay Unit
Audio/Video Route Survey, Special.....	Lump Sum

Color Audio Video Route Survey will be measured as a unit. Payment of this item shall be payment in full for all costs associated with “Audio/Video Route Survey, Special.”

The following items will not be measured and paid for separately and will include the furnishing of all labor, materials, and equipment as necessary to complete this work, and are included in the bid item “Audio/Video Route Survey”:

- Mobilization.
- Furnishing and usage of all audio video equipment.
- Providing the Engineer two (2) flash drives containing the color audio video route survey.

CITY OF WIXOM
SPECIAL PROVISION
FOR
IRRIGATION

HRC

1 of 4

2-23-23

Description

Contractor shall design an irrigation system to provide watering for the proposed landscaped area on the south side of Pontiac Trail, west of Wixom Road. See landscape plan sheet for planting and planter box information.

Contractor shall determine and provide as part of the design, layout of all sprinklers, valves, piping, and wiring including locations and sizes, timer designation, GPM and valve size for each zone, water pressure requirements and related apparatus, piping routes, controller locations, the location and number of heads, a pit-type structure location for system controls, electrical requirements and wiring plans. Contractor shall acquire any and all necessary permits and have the final plans approved by the City of Wixom or his authorized representative. Contractor shall install a system that operates on AC power.

The Contractor shall be responsible for this turnkey project from design through installation and restoration and other related services as required. Contractor's work shall include, but not be limited to:

- Design of irrigation system (drawings to scale)
- Permits
- Pit construction
- Materials and Equipment
- Installation of all components
- Labor
- Associated interior and exterior plumbing
- Power connection and any coordination required
- Testing
- Restoration/grass replacement
- Training
- Maintenance
- Warranties

Materials

Equipment and materials provided for the system installations shall be standard product of a manufacturer, regularly engaged in the manufacture of the product that have been performing satisfactorily. The equipment shall be supported by an authorized service organization or factory employee (of the manufacturer/supplier) that is reasonably convenient to the jobsite. Discontinued models are not acceptable. No work shall be started before all materials are in the possession of the Contractor.

Contractor shall represent and warrant that the goods, materials and supplies or components offered to the City under this proposal are new, not used or re-conditioned and are not such age or so deteriorated as to impair their usefulness or safety and that the goods, materials, supplies or components offered are current production models of the respective manufacturer.

Construction

The water supply for the irrigation system will come from inside of the basement of the Klebba Building (49357 Pontiac Trail) which is located adjacent to the sidewalk. The contractor will be responsible for pulling a (no cost) plumbing permit from the City, installing the water meter, making the connection to the existing water line in the basement and running ¾" copper pipe to the northwest most corner of the basement (+/-75'). From there, the contractor shall install a shut off valve and will have to core drill the water line through the basement wall providing water for the irrigation system. The contractor must seal the basement wall with a waterproof hydraulic cement. In a location approved by the Engineer, the Contractor shall install a backflow preventer and means to blow out the system from outside of the building.

The power supply for the irrigation system will come from the existing lighting that is present within the job location. The Contractor will be responsible for pulling a (no cost) electrical permit from the City and making the necessary connections.

The construction of the sprinkler systems shall include the furnishing, installing and testing of all mains, laterals, pipe and pipe fittings, backflow preventers devices, sprinkler heads, meters, quick coupling valves, control valves and boxes, controllers (2 separate controllers with battery back-up), rain sensor, rock box for backflow enclosure with the ability to padlock, spigot on valve for backflow preventer, electric wire, enclosures, sleeves, boring and other necessary equipment as well as the removal and/or restoration of existing improvements, excavation and backfill and all other work installation required for a complete system.

The Contractor shall perform all necessary excavating and backfilling required for the proper installation of the work. When backfilling, all backfill material shall be free from rock, large stone or other unsuitable substances to prevent damage to the pipe. Backfill material shall be compacted in 6" layers up to finished grade to ensure that no settling results. Trenches shall be wide enough to allow at least 6" between parallel pipe lines. All piping run under roadways, sidewalks, retaining walls or areas of construction shall be sleeved with Schedule 40 PVC or Class 160 to allow for repair. Contractor shall be responsible for the removal and legal disposal of sod, debris or any other materials from the construction site.

Installation of irrigation system shall be in accordance with the latest manufacturer's recommendations and by professionals meeting the conditions of manufacturer's written or published instructions and warranty.

Upon completion and prior to acceptance of the installation, the irrigation system shall be tested at the operating conditions to demonstrate satisfactory functional and operating efficiency. All test deficiencies shall be corrected and retested prior to acceptance by the Engineer. All instruments, facilities and labor required to properly conduct the tests shall be provided by the Contractor. A record shall be kept of all the conditions, leaks, repairs and the date(s) of such tests. All necessary adjustments to the equipment, as required, shall be made to assure efficient operations. The system shall be operated through a complete cycle before acceptance by the Engineer. Contractor will provide training on the operation and maintenance of the system to City staff.

Manufacturer's one (1) year warranty from date of acceptance on materials and contractor's warranty on all materials, equipment, parts and labor for a period of one (1) year from the date of final acceptance of the complete job, against original defects of material and workmanship or excessive wear or deterioration and defects to be made good at the Contractor's expense with no cost or obligation to the City. Printed copies of warranties will be provided to the City.

Submittals

- A. Contractor must submit manufacturer's literature, including installation instructions.

- B. Manufacturer’s Operation and Maintenance Manual, which outlines the step-by-step procedures required for system start-up, operation and shut-down. The instructions shall include the manufacturer’s name, telephone number, model number, service manual number, parts list and brief description of all equipment and their basic operating features. The maintenance instructions shall list routine maintenance procedures, possible breakdowns and repairs and troubleshooting guide.
- C. Upon completion and testing of the installed system, contractor shall submit test reports showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of any controls used to balance system performance.
- D. Additional testing may be performed by the Engineer for final acceptance.
- E. Upon completion and testing of the installed system, Contractor shall provide to the City final as-built drawings of the system in both hard copy and electronic copy.

Final Cleanup

- A. The work shall not be considered as completed, nor will final payment be made until the area has been restored to a neat, orderly appearance acceptable to the Building/Facilities Department or the authorized representative. Equipment, excess material, rubbish, etc., resulting from the Contractor’s operation must be removed from the site.
- B. Repair of all areas disturbed by the Contractor’s operations shall be in accordance with the best modern practices, the City’s standards and/or as specified at the time of requested service. Contractor shall go over the entire project line and remove all construction debris, including forms, form pins, bracing and any other deleterious materials. Refill any places that may have settled. The Contractor shall then re-grade and put in shape all backfilled trenches, all fills they may have made from the excess excavated materials and all other areas that may have been disturbed through their operations.

Training

- A. City personnel shall be trained on operating functions as well as start-up and shut-down of the system. Demonstrate the proper operation of each and every head, electric valve and each controller.
- B. Written operating and maintenance instructions shall be provided, as well as instruction sheets and parts lists for all operating equipment.

Maintenance

- A. Contractor shall provide one (1) year of maintenance on the irrigation system, including one (1) winterization and one (1) spring start-up. During winterization and spring start-up, the Contractor shall inspect the irrigation system for proper operation of all controls, sprinkler heads, valves to insure the irrigation system will operate as designed.
- B. Contractor shall provide all maintenance tools applicable to installation, including valve keys and quick coupler keys.

Measurement and Payment

The completed work will be paid for at the contract unit price for the following contract pay items:

Pay Item	Pay Unit
Allowance for Irrigation System, Special.....	\$30,000 Dollars

Final payment will be adjusted to reflect the actual invoiced costs based on the unit prices agreed to. If the invoiced costs are less than those set forth in the bid item, the Owner will receive a credit, based upon the remaining allowance amount. If the invoiced costs are greater for those bid items, the Contractor will receive additional payments based upon the amount in excess. The Contractor should make no assumptions regarding the above stated quantities or allowances. The Contractor shall not mark-up invoices associated with the Allowance item listed above.

The construction of the system shall include the furnishing, installing and testing of: valves, control valves, controllers, electric wire and all necessary specialties as required for a complete project and will not be paid for separately.

The landscaping plants, trees, planter boxes, etc. shall be paid for separately.

The Owner shall not pay for more than one mobilization to the site.

CITY OF WIXOM
SPECIAL PROVISION
FOR
PERMITS AND INSPECTION FEES

HRC

Page 1 of 2

February 24, 2023

a. Description

The Contractor shall observe and follow all permit(s) required for project construction in accordance with Section 107.02, Permits and Licenses, of the 2020 Standard Specifications for Construction. The Owner has applied for the following permit(s) which shall be obtained by the Contractor.

In addition, the Contractor shall adhere to the specifications in this proposal and details included in the plans, as required by the permit(s).

b. Materials

All work must be in accordance with the contract documents.

c. Construction

Refer to Table 1 on page 2.

d. Measurement and Payment

Permit and inspection fees assessed by the respective agencies shall be paid for by the following pay item.

Pay Item	Pay Unit
Reimbursed Permit Fees, Special	Dollar

The completed work as measured for **Reimbursed Permit Fees** shall include actual permit and/or inspection fees only as assessed by the permit issuer. The Contractor is required to submit receipts to the Engineer for reimbursement.

The Contractor shall comply with the requirements of the Soil Erosion and Sedimentation Control Act of the State of Michigan, Act 347 of P.A. of 1973 and with all requirements, rules, and standards of the County of Oakland and the City of Farmington Hills. Soil Erosion Controls shall be provided as shown on the plans and as directed by the City Representative. Note that in order to be paid for this item, specific soil erosion and sedimentation control measures must be in place and maintained throughout the duration of the project.

Permit fees will be reimbursed once applicable receipts are received by the Engineer. This pay item will not pay for refundable construction bonds nor will it pay for refundable inspection escrows necessary to facilitate any permit. The Contractor shall consider any bonding or escrows necessary incidental to the project. Furthermore, the Owner shall be held harmless from any loss of construction bond or inspection escrow.

Table 1: Permits and Fees

Reference Number	Issuing Agency	Permit and Work Type	Bond	Insurance	Notes
TBD	RCOC	RIGHT OF WAY	YES	YES	See permit for conditions including bond and insurance requirements.

CITY OF WIXOM
SPECIAL PROVISION
FOR
PLANTER MIX

HRC

1 of 1

2-23-23

Description

This work shall consist of installing plant mix for use in the planter boxes. The work shall be performed according to Section 302 of the 2020 Standard Specifications for Construction, except as herein specified. Topsoil for use on this project shall consist of imported, finely pulverized and screened material.

The Contractor shall furnish samples for testing as directed and no shipments to the job site shall commence until the source of material has been approved.

Materials

The material shall meet the requirements specified in section 816 of the 2020 Michigan Department of Transportation Standard Specifications for Construction.

Imported topsoil shall be a friable loam, free of roots and sticks, rocks larger than ½ inch, clay lumps, subsoil, debris, weeds and foreign matter. It shall contain no toxic materials, slag, cinders, viable plants or plant parts and shall have an acidity range (pH) of 5.5 to 7.5 and contain a minimum of 4% and a maximum of 25% inorganic matter conforming to ASTM D2487.

Construction Methods

The construction shall meet the requirements specified in section 816 of the 2020 Michigan Department of Transportation Standard Specifications for Construction.

Measurement and Payment

Planter Mix, Special will be paid for at the Contract unit price per cyd yard which includes all work indicated in this Special Provision and related Contract References.

Pay Item

Pay Unit

Planter Mix, SpecialCubic Yard

Payment for **Planter Mix, Special** shall include all labor, equipment, and materials required to complete the work described.

CITY OF WIXOM
SPECIAL PROVISION
FOR
PLANTER BOX

HRC

1 of 2

2-23-23

Description

- A. Construct planter boxes at locations shown on plans. Sizes of each planter box vary, see plan sheet for details.
- B. Subcontractor shall have a minimum 5 years' experience with installing block walls with stone foundations and related work.

Submittals

- A. Submit manufactures specifications on wall colors, sizes and face finishes for approval by owner's representative.

Materials

- A. Stone Subbase to be 21AA crushed concrete or approved equal.
- B. Non-woven geotextile fabric trench wrap.
- C. Planter walls to be constructed with blocks as supplied by Unilock.

Brick Style: Lineo

Brick Color: Sierra

Brick Size: Various sizes with random placement per manufacturers specifications. Planter walls to have XL rectangle units placed as cap.

See attached for more information.

Construction Methods

- A. Construction shall be as required by the 2020 Michigan Department of Transportation Standard Specifications for Construction and as shown on the plans.
- B. Locate and layout the walls for approval by the project Engineer or Owners Representative. It is intended that all planter wall limits will be defined by the extent of the concrete walks and steps. Therefore, all concrete walks and steps must be constructed prior to final planter wall work.
- C. Excavate in undisturbed subsoils, trenches for wall footings. Ensure conflicts with utilities are resolved. Do not proceed with wall footings until all utility's conflicts have been resolved.
- D. Line foundation trench with non-woven geotextile fabric shown on the details.
- E. Install 21AA stone footing materials in compacted lifts to the elevations as shown on the drawings.
- F. Install Unilock wall blocks/brick (or approved equal) to form the walls. Install per manufactures instruction. Use leveling sand or gravel to adjust first row of blocks/bricks as needed or recommended by the manufacturer. Secure each row of blocks/bricks as needed and recommended by the manufacturer.
- G. Drill top wall blocks and insert pins and install cap blocks per manufacturer's instructions.

Project Conditions

- A. Work notifications: Notify Engineer at least 7 working days prior to start of wall construction operation.
- B. Protect existing utilities, paving and other facilities from damage caused by wall construction operations.
- C. Construct walls only after Engineer has approved the layout of each wall.
- D. Restrict traffic from interference with wall construction. Erect signs and barriers as required.

Measurement and Payment

The completed work, as described, will be measured, and paid for at the contract unit price using the following pay item:

<u>Pay Item</u>	<u>Pay Unit</u>
Planter Box, Special.....	Foot

Planter Box, Special includes furnishing all labor and equipment necessary to complete the work as described. Planter Box, Special includes all items shown in detail on drawings including, but not limited to, 21AA Aggregate Base, Leveling Sand, Geotextile Fabric, Pins, etc. Concrete sidewalk and Plant mix paid for separately.

LINEO™ DIMENSIONAL STONE - AVAILABLE IN ,

Ideal for garden walls, pillars and other outdoor vertical elements.

Contemporary and sleek lines define Lineo Dimensional Stone with a linear, multi-length plank look. Ideal for garden walls, pillars, other outdoor vertical elements, Lineo Dimensional Stone offers up modern design and exceptional flexibility.



GRANITE SIERRA SANDALWOOD

Special Order Colors



MIDNIGHT CHARCOAL SIERRA ALMOND GROVE LIMESTONE SANDSTONE MAHOGANY ASH



PLATINUM WALNUT GRANITE BLEND

Minimum quantities and special pricing may apply. [Contact us](#) for more details.



With so many different options for customization we ask that you [contact](#) your local Unilock Representative for more information about customizing this product.

Minimum quantities will apply.



PILLAR UNIT
40 CM X 20 CM X 10 CM
15.75" X 7.875" X 3.875"

28.5 PILLAR CAP
72.4 CM X 72.4 CM X 10 CM
28.5" X 28.5" X 3.875"

block sizes randomly placed with XL used as cap

Wall Random



XL RECTANGLE
60 CM X 20 CM X 10 CM
23.625" X 7.875" X 3.875"

LARGE RECTANGLE
50 CM X 20 CM X 10 CM
19.625" X 7.875" X 3.875"

RECTANGLE
40 CM X 20 CM X 10 CM
15.75" X 7.875" X 3.875"

SMALL RECTANGLE
30 CM X 20 CM X 10 CM
11.75" X 7.875" X 3.875"

Special Order Shapes & Sizes



PILLAR CAP
74 CM X 74 CM X 10 CM
29.125" X 29.125" X 3.875"

PILLAR CAP 28.5X28.5
74 CM X 74 CM X 10 CM
29.125" X 29.125" X 3.875"

PILLAR CAP (28.5 X 28.5)
72.4 CM X 72.4 CM X 10 CM
28.5" X 28.5" X 3.875"

Wall Random



Minimum quantities and special pricing may apply. [Contact us](#) for more details.

Stones & Bundling	Face Feet Per		Linear Feet Per		Units Per		Per Bundle		Lbs Per	
	Bundle	Unit	Bundle	Unit	Bundle	Facet Feet	Layers	Unit	Bundle	
Pillar Unit	47.8	0.67	95.1	1.321	72	1.5	3	39	2525	
Random Bundle	31.91		94.46		63		3		2845	
XL Rectangle	11.63	0.65	35.42	1.97	18	1.55				
Large Rectangle	8.31	0.54	24.6	1.64	15	1.86				
Rectangle	6.46	0.43	19.68	1.31	15	2.32				
Small Rectangle	4.84	0.32	14.76	0.98	15	3.01				
Pillar Cap					5			302	1510	

Product sold in full bundles only.

No records found.

TECHNICAL INFORMATION

ASTM C 1372 Standard Specifications for Dry-Cast Segmental Retaining Wall Units

Conforms to:

- C140 for Absorption and Compressive Strength > 3000 PSI
- C1262 for Freeze Thaw Durability <1% mass loss
- C1372 Overall dimensional variations permissible for width, height and length ± 1/8" (±3.2mm)

Unilock standards exceed 6,000 PSI for Lineo Dimensional Stone products with:

- 4% absorption avg.
- 5% absorption max.
- Dimensional Accuracy +/- 5/64" (±2.00mm)

Test results available upon request

Meets the U.S. Architectural & Transportation Barrier Compliance Board Slip-Resistance Surfaces Advisory Guidelines

LEED INFORMATION

Materials & Resources: LEED V4:

Building Product Disclosure and Optimization

Sourcing of Raw Materials – Sourcing of Raw Materials and Extraction • 1 point

Sourcing of Raw Materials – Leadership Extraction Practices • 1 point

Material Ingredient Reporting – Material Ingredient Reporting • 1 point

Material Ingredient Reporting – Material Ingredient Optimization • 1 point

Environmental Product Declaration • 1 point



LIST OF DRAWINGS

SHEET NO.	SHEET TITLE
1	COVER SHEET
2	NOTES SHEET
3	TYPICAL SECTION
4	DETAIL SHEET
5-6	REMOVAL & CONSTRUCTION SHEETS
7	DETAIL GRADES
8-9	MAINTAINING TRAFFIC
10	LANDSCAPE NOTES AND DETAILS
11	LANDSCAPE PLAN
12-14	STANDARD DETAIL SHEETS

2023 SIDEWALK IMPROVEMENT PROGRAM

PONTIAC TRAIL



OAKLAND COUNTY, MICHIGAN

ISSUED FOR BIDS
February 28, 2023

PREPARED BY:



105 W. GRAND RIVER
HOWELL, MI. 48843

PHONE: (517) 552-9199
FAX : (517) 552-6099
WEB SITE: [http:// www.hrcengr.com](http://www.hrcengr.com)



WIXOM CITY COUNCIL

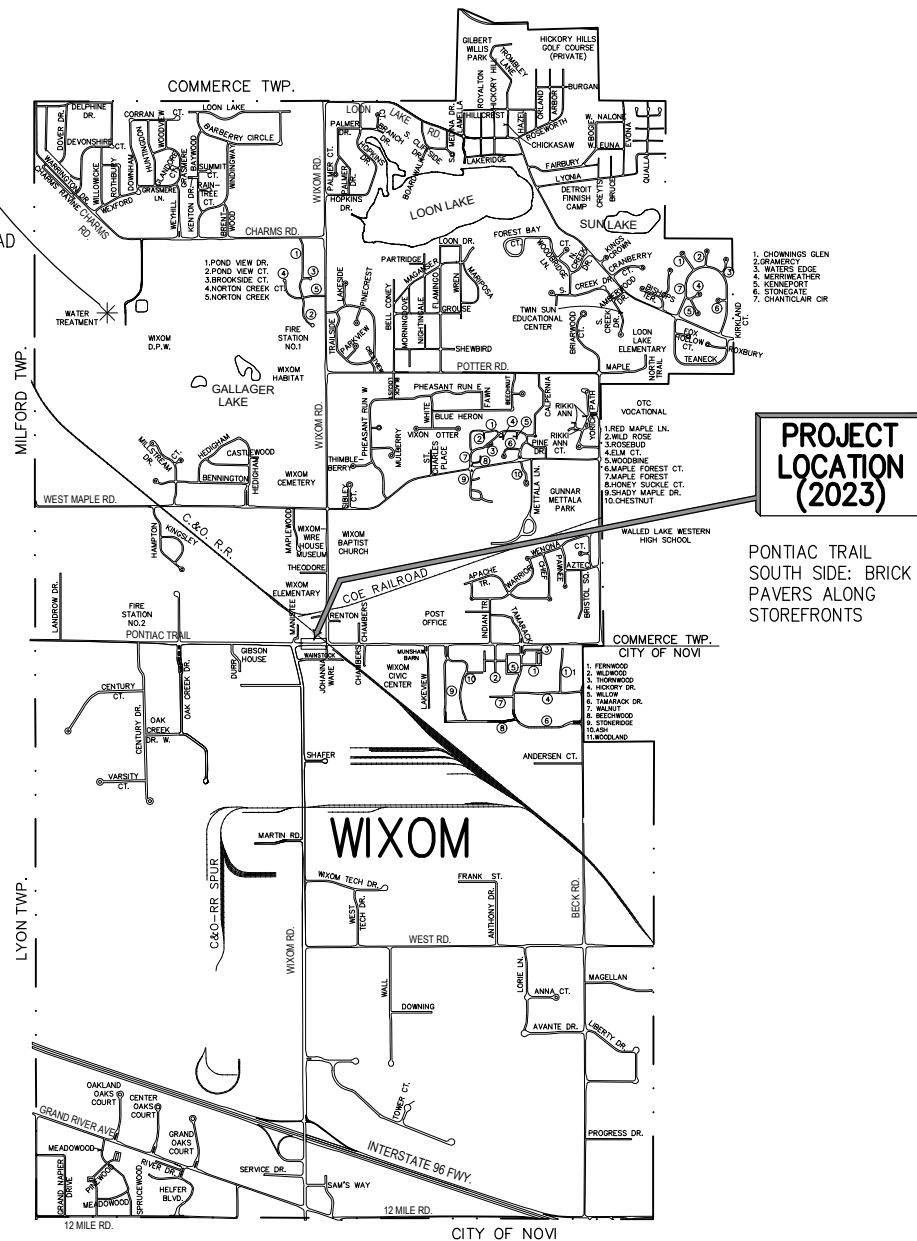
PATRICK BEAGLE - MAYOR
THOMAS RZEZNIK - DEPUTY MAYOR

PETER BEHRMANN
KEENAN GOTTSCHALL
TIA GRONLUND - FOX
PETER SHARPE
ROBERT SMILEY

CITY ADMINISTRATION

STEVEN BROWN - CITY MANAGER
TIM SIKMA - DEPARTMENT OF PUBLIC WORKS DIRECTOR
CATHERINE BUCK - CITY CLERK

CITY OF WIXOM
DEPARTMENT OF
PUBLIC WORKS
2041 CHARMS ROAD
WIXOM, MI 48393
248-624-0141



LOCATION MAP
NO SCALE



HUBBELL, ROTH & CLARK, INC.
JOB NO. 20220938
PREPARED UNDER THE SUPERVISION OF:
MICHAEL P. DARGA
REGISTERED PROFESSIONAL ENGINEER
MICHIGAN REGISTRATION NO. 51113

ABBREVIATIONS

Table with columns for HORIZONTAL CURVES, GENERAL, and VERTICAL CURVES, listing various engineering terms and their abbreviations.

UTILITIES

THE EXISTING UTILITIES LISTED BELOW AND SHOWN ON THESE PLANS REPRESENT THE BEST INFORMATION AVAILABLE AS OBTAINED FROM SURVEYS AND FROM UTILITY RECORD MAPS.

THE FOLLOWING UTILITY COMPANIES HAVE FACILITIES WITHIN THE PROJECT LIMITS:

- DTE ENERGY - DETROIT EDISON
CONSUMERS ENERGY
CITY OF WIXOM SANITARY SEWER AND WATER SYSTEM

- ATT
COMCAST
REGIONAL DESIGN CENTER
CITY OF WIXOM D.P.W. STORM SEWER

OWNERS OF PUBLIC UTILITIES WILL NOT BE REQUIRED TO MOVE POLES OR STRUCTURES THAT ARE NOT WITHIN GRADING OR STRUCTURE LIMITS IN ORDER TO FACILITATE THE OPERATION OF CONSTRUCTION EQUIPMENT.

THE CONTRACTOR SHALL, BEFORE EACH DAYS WORK, OR WHEN MOVING TO A NEW AREA OF WORK, DETERMINE AND EVALUATE THE LOCATION OF ALL UNDERGROUND FACILITIES IN THE AREA.

ALL GAS FACILITIES SHALL BE PROTECTED AND SUPPORTED PER DISTRIBUTION STANDARDS AND CONSUMERS ENERGY SPECIFICATIONS.

PRIOR TO WORK ON FACILITIES BELONGING TO THE ABOVE AGENCIES, A MINIMUM OF 72 HOURS NOTICE MUST BE GIVEN IN ORDER TO INSURE PROPER INSPECTION BY THE RESPECTIVE AGENCIES.

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK, AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO INSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

FOR PROTECTION OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL DIAL 811 OR (800) 482-7171 A MINIMUM OF 3 FULL WORKING DAYS, EXCLUDING SATURDAY, SUNDAY AND HOLIDAYS, PRIOR TO EXCAVATING IN THE VICINITY OF UTILITY LINES.

THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY THE CONTRACTOR.

UTILITY NOTE NO. 1

THE UTILITY CONFLICTS INFORMATION PROVIDED HEREIN BY HUBBELL, ROTH & CLARK ("HRC") SHALL NOT BE CONSTRUED AS ANY FORM OF CERTIFICATION, WARRANTY (EXPRESS OR IMPLIED) OR GUARANTEE ON BEHALF OF HRC REGARDING THE ACTUAL LOCATION OF THE UTILITIES IN QUESTION.

PROVIDING THIS INFORMATION SHALL NOT CREATE ANY FORM OF CONTRACTUAL (OR OTHER) RELATIONSHIP BETWEEN HRC AND ANY ENTITY INVOLVED IN THE PROJECT.

WATER & SEWER SYMBOLS

Table showing symbols for existing and proposed water and sewer infrastructure, including storm sewer, sanitary sewer, water main, manholes, valves, and pumps.

UTILITY SYMBOLS

Table showing symbols for existing and proposed utility lines and structures, including electrical, telecommunications, natural gas, oil, and various poles and risers.

MISCELLANEOUS

Table showing symbols for existing and proposed miscellaneous features, including slope stake lines, ditches, wetlands, fences, guardrails, and various types of vegetation and structures.

MISCELLANEOUS PAY ITEMS

THE FOLLOWING ITEMS OF WORK WILL NOT BE PAID FOR SEPARATELY BUT ARE INCLUDED IN OTHER ITEMS OF WORK AND SHALL BE DONE AS REQUIRED BY THE ENGINEER.

INCLUDED IN THE COST OF THE PROJECT:

- REMOVING EDGEDRAIN, UNDERDRAIN, FRENCH DRAINS, OR DRAINAGE TILE
RELOCATING ORNAMENTAL ROCKS AND BOULDERS TO THE RIGHT-OF-WAY LINE
REMOVING ABANDONED UTILITY CONDUIT AND INTERNAL COMPONENTS

INCLUDED IN HMA PAY ITEMS:

- HMA BOND COAT
SWEEPING PAVEMENT
PAVT, CLEANING

INCLUDED IN PAVEMENT OR CURB REMOVAL ITEMS:

- SAWING FOR PAVEMENT AND CURB REMOVAL

INCLUDED IN CONCRETE ITEMS:

- CONCRETE ADMIXTURES
CONCRETE JOINT CONSTRUCTION IN ACCORDANCE WITH MDOT STANDARD PLANS
CONCRETE LOW TEMPERATURE PROTECTION IN ACCORDANCE WITH MDOT 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION

THE FOLLOWING ITEMS OF WORK SHALL BE DONE AS THEY APPLY THROUGHOUT THE PROJECT OR AS DIRECTED BY THE ENGINEER. THESE ITEMS ARE NOT DETAILED OR INCLUDED ELSEWHERE ON THE PLANS.

Table titled AS-DIRECTED QUANTITIES with columns for Item Description, Qty, and Unit, listing various construction items and their quantities.

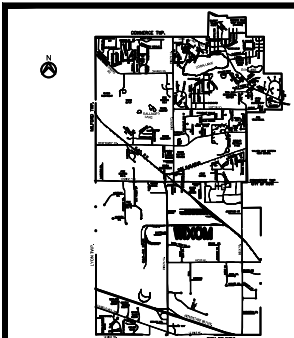


DEPARTMENT OF PUBLIC SERVICES

HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915

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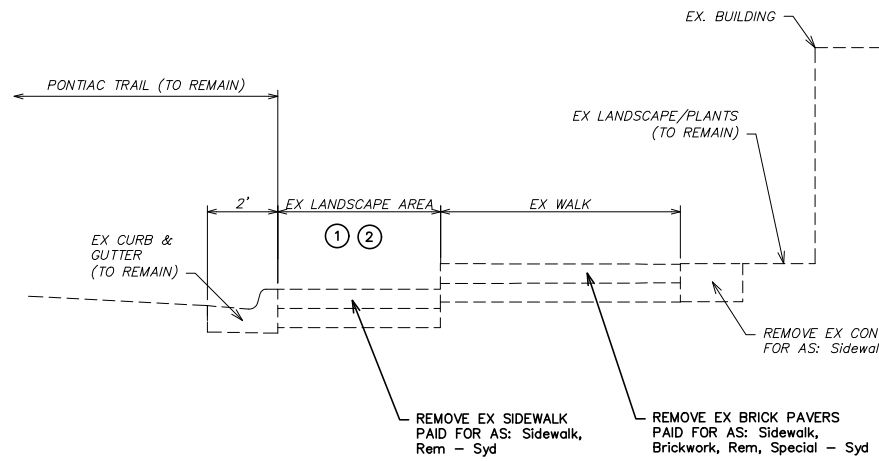
Table with columns for DATE and ADDITIONS AND/OR REVISIONS, containing project revision history.



CITY OF WIXOM 2023 SIDEWALK IMPROVEMENTS PROGRAM

PROJECT NOTES

Table with project details including HRC JOB NO. (20220938), SCALE (NO SCALE), DATE (FEB 2023), and SHEET NO. (2).

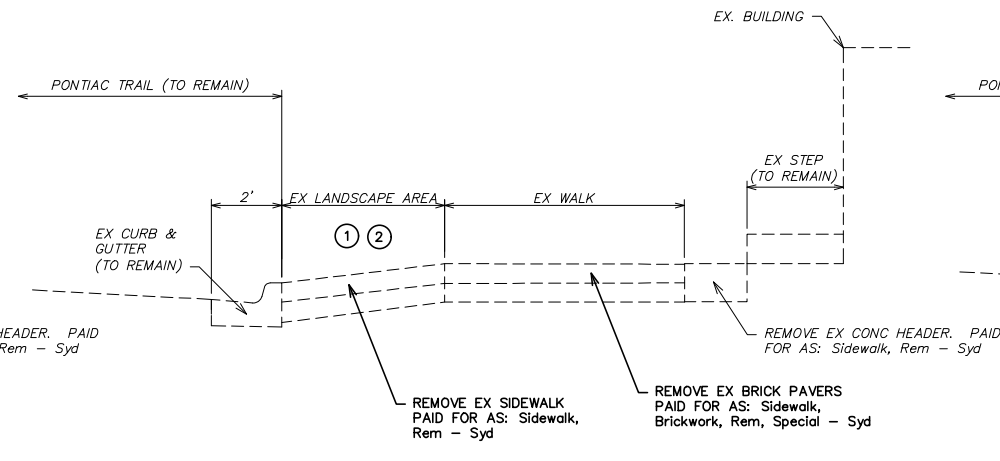


EXISTING SIDEWALK DETAIL

NO SCALE

NOTES:

- ① EX LANDSCAPE PLANTERS PRESENT. REMOVAL INCLUDED IN: Station Grading, Special - Sta
- ② EXISTING LIGHTS TO REMAIN

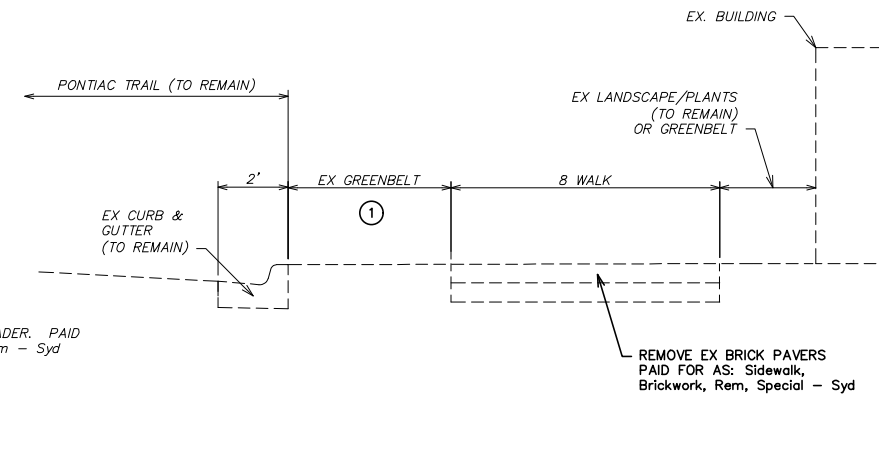


EXISTING SIDEWALK DETAIL

NO SCALE

NOTES:

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- ② EXISTING LIGHTS TO REMAIN

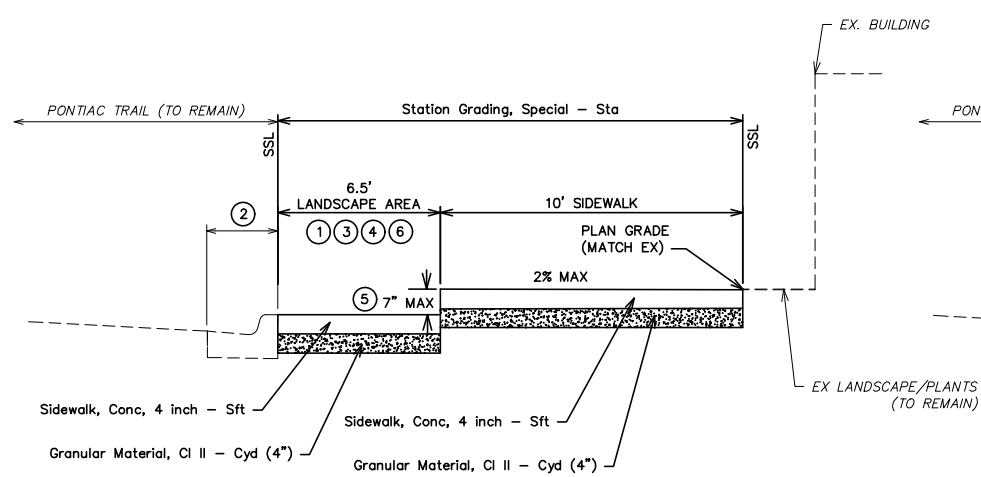


EXISTING SIDEWALK DETAIL

NO SCALE

NOTES:

- ① EXISTING LIGHTS TO REMAIN

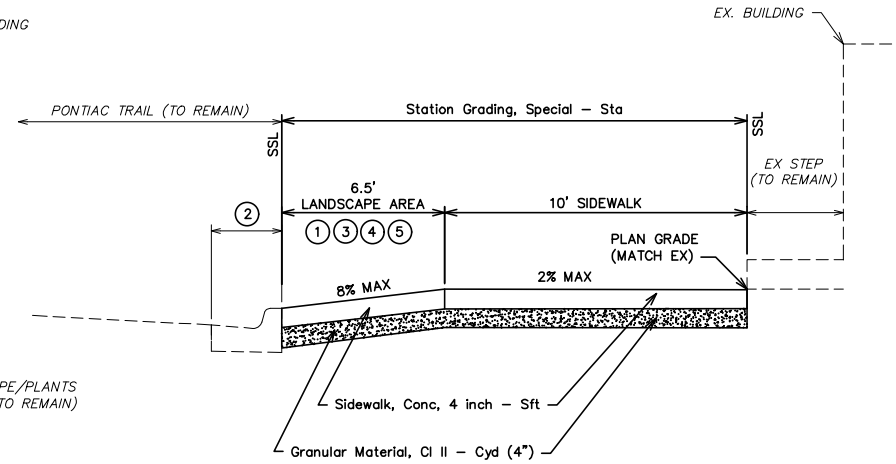


PROPOSED SIDEWALK DETAIL A

NO SCALE
TO APPLY: 40+05 TO 41+10
41+52 TO 43+48

NOTES:

- ① SEE LANDSCAPE PLAN FOR ADDITIONAL INFORMATION AND FEATURES
- ② EXISTING CURB AND GUTTER TO REMAIN
- ③ SLOPE TO MEET EXISTING BACK OF CURB
- ④ EXISTING LIGHTS TO REMAIN
- ⑤ ALL COSTS ASSOCIATED WITH FORMING AND POURING STEP TO BE INCLUDED IN: Sidewalk, Conc, 4 inch - Sft
- ⑥ FOR LOCATIONS WHERE PLANTER BOX IS PROPOSED, CONTRACTOR TO FORM SIDEWALK TO ACCOMMODATE PLANTER BOX. SEE DETAIL SHEET, CONSTRUCTION AND LANDSCAPE PLAN FOR MORE INFORMATION.

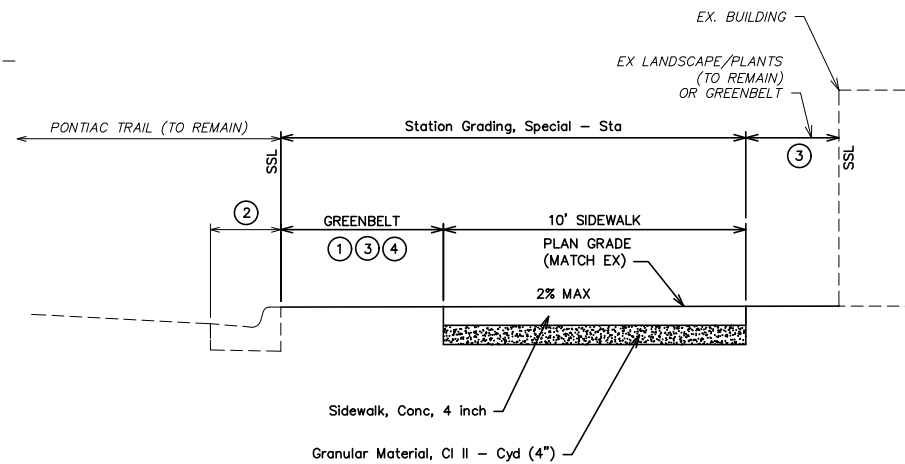


PROPOSED SIDEWALK DETAIL B

NO SCALE
TO APPLY: 41+10 TO 41+52

NOTES:

- ① SEE LANDSCAPE PLAN FOR ADDITIONAL INFORMATION AND FEATURES
- ② EXISTING CURB AND GUTTER TO REMAIN
- ③ SLOPE TO MEET EXISTING BACK OF CURB
- ④ EXISTING LIGHTS TO REMAIN
- ⑤ FOR LOCATIONS WHERE PLANTER BOX IS PROPOSED, CONTRACTOR TO FORM SIDEWALK TO ACCOMMODATE PLANTER BOX. SEE DETAIL SHEET, CONSTRUCTION AND LANDSCAPE PLAN FOR MORE INFORMATION.



PROPOSED SIDEWALK DETAIL C

NO SCALE
TO APPLY: 43+48 TO 44+18 (POE)

NOTES:

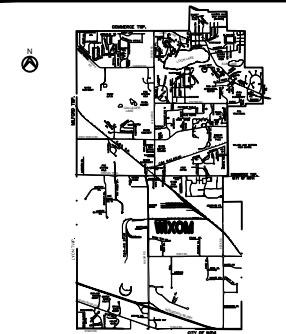
- ① SEE LANDSCAPE PLAN FOR ADDITIONAL INFORMATION AND FEATURES
- ② EXISTING CURB AND GUTTER TO REMAIN
- ③ RESTORATION, PAID FOR AS: Turf Establishment, Special
- ④ EXISTING LIGHTS TO REMAIN



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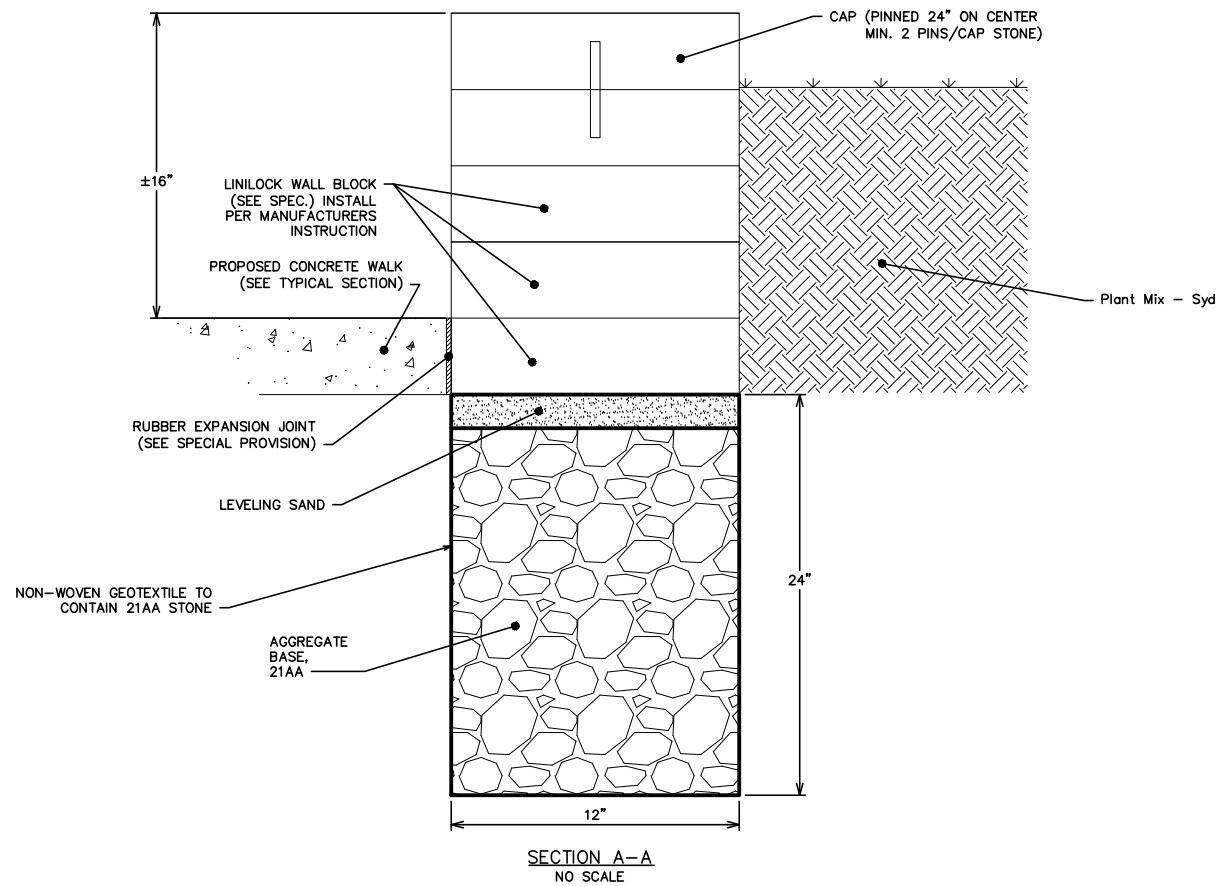
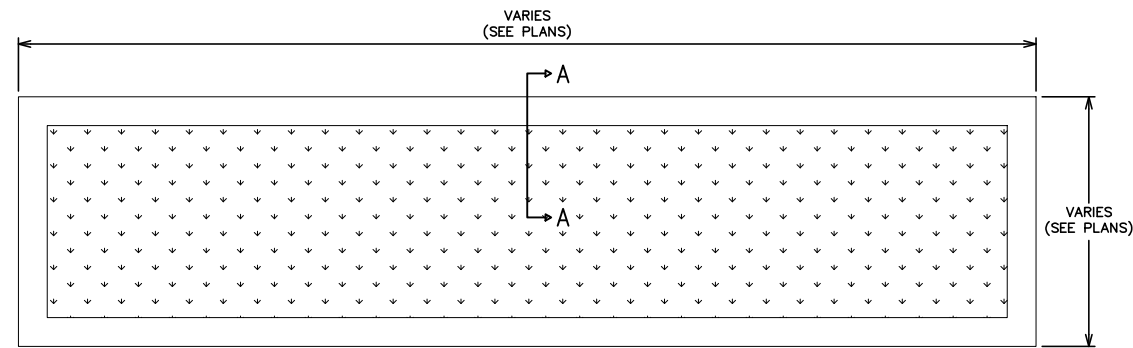
2/28/2023	ISSUED FOR BIDS
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED LG/AM	
DRAWN LG/AM	
CHECKED AM	
APPROVED	



CITY OF WIXOM 2023 SIDEWALK IMPROVEMENTS PROGRAM

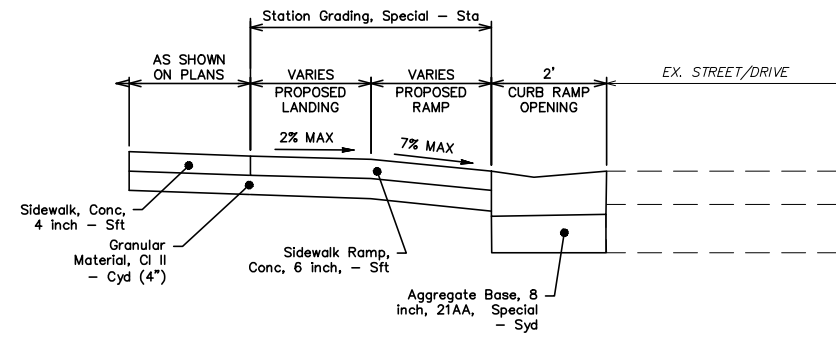
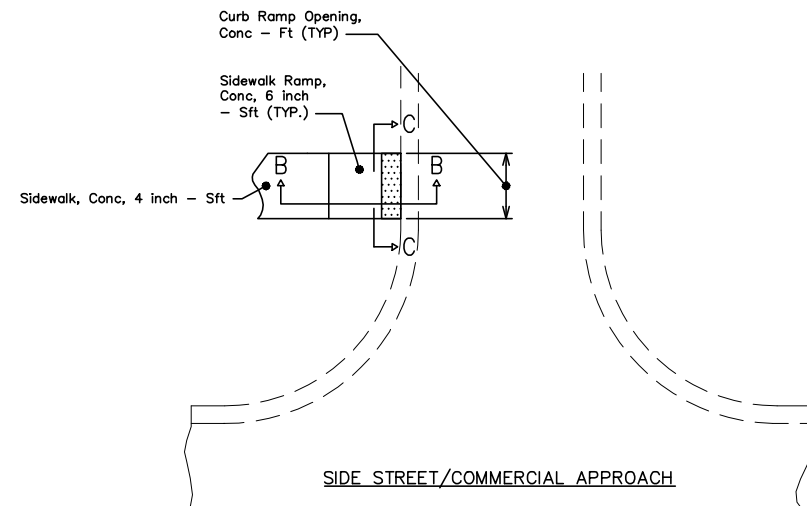
TYPICAL SECTIONS

HRC JOB NO. 20220938	SCALE
DATE FEB 2023	SHEET NO. 3

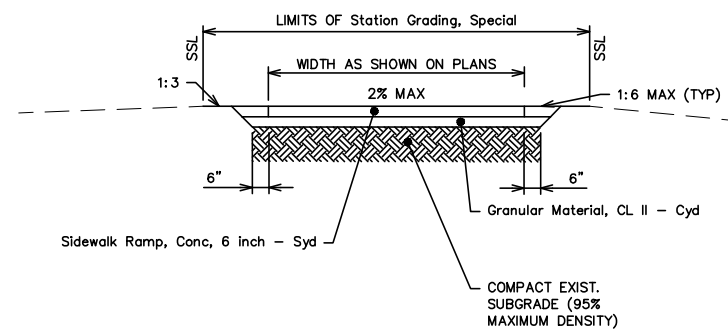


TYPICAL PLANTER BOX WALL DETAIL
NO SCALE

NOTE:
1. ALL INFORMATION SHOWN IS INCLUDED IN THE COST OF: Planter Box, Special - Ft



SECTION B-B
NO SCALE



SECTION C-C
NO SCALE

SIDEWALK/ RAMP/ LANDING DETAIL
NO SCALE

NOTE:
1. WIDTH AS INDICATED IN CURB DETAIL OR AS DIRECTED IN THE FIELD.



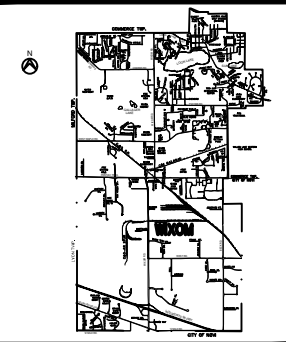
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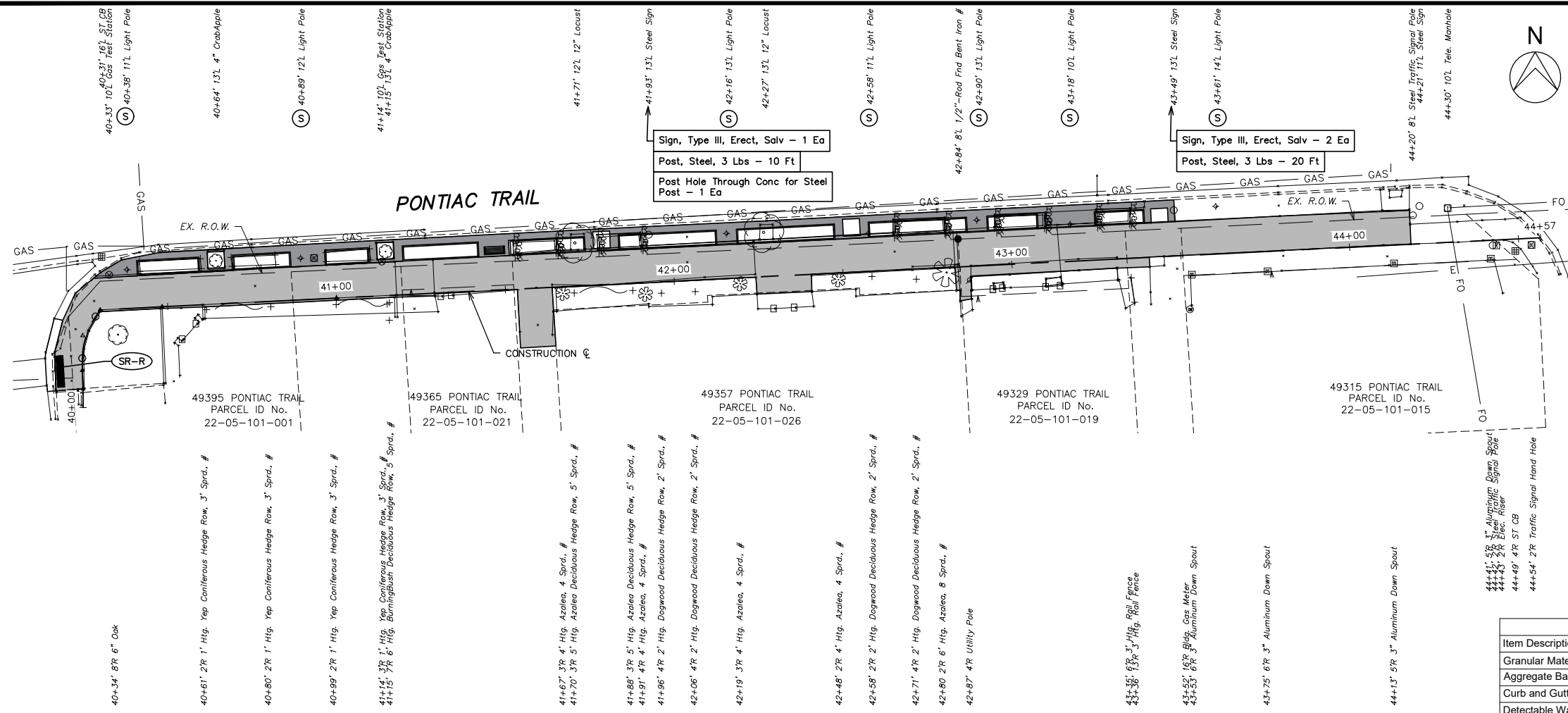
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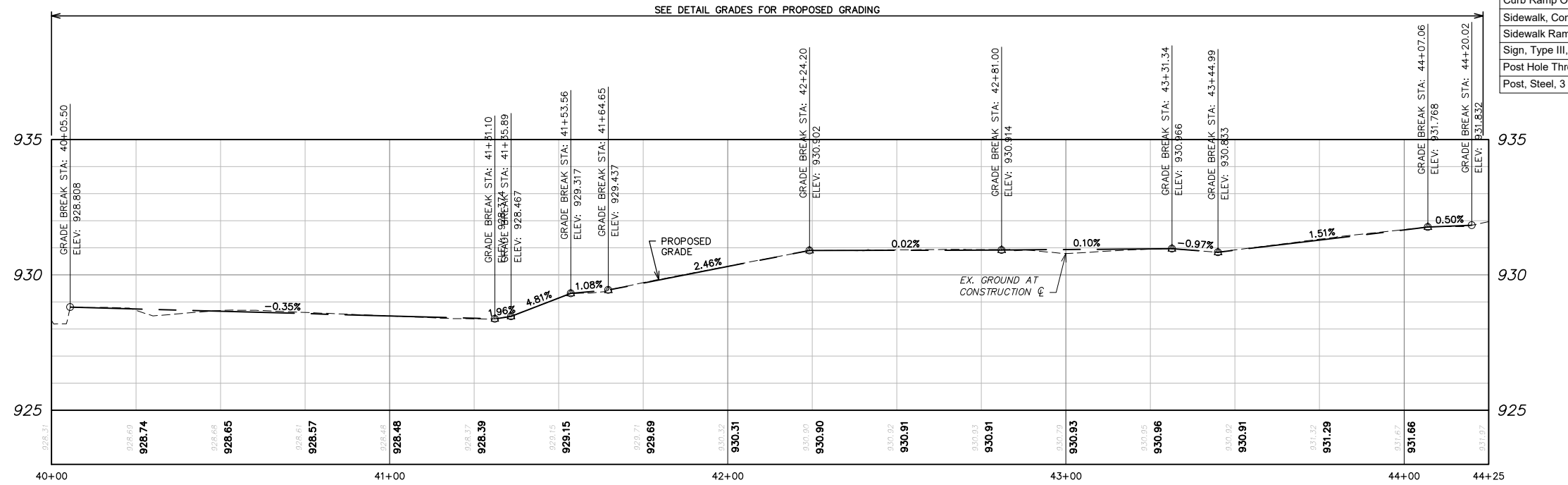
CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM

DETAILS

HRC JOB NO. 20220938	SCALE NO SCALE
DATE FEB 2023	SHEET NO. 4



BENCHMARK		
BM. #	DESCRIPTION	ELEV.
302	ARROW ON HYDRANT NORTH SIDE OF PONTIAC TRAIL 50' +/- EAST OF BUILDING #49348	933.07
303	TOP OF SOUTH EDGE OF CONCRETE LIGHT POLE BASE NORTH SIDE OF PONTIAC TRAIL AT BUILDING #49378	928.28



Pontiac Trail West Alignment

QUANTITIES - THIS SHEET		
Item Description	Qty	Unit
Granular Material, CL II	82	Cyd
Aggregate Base, 8 inch, 21AA, Special	10	Syd
Curb and Gutter, Conc, Match Existing, Special	10	Ft
Detectable Warning Surface	10	Ft
Curb Ramp Opening, Conc	10	Ft
Sidewalk, Conc, 4 inch	6650	Sft
Sidewalk Ramp, Conc, 6 inch	50	Sft
Sign, Type III, Erect, Salv	3	Ea
Post Hole Through Conc for Steel Post	1	Ea
Post, Steel, 3 lb	30	Ft

- NOTES**
- SEE LANDSCAPE PLAN FOR ADDITIONAL INFO/QTY
 - SEE IRRIGATION SPEC FOR ADDITIONAL INFO/QTY
 - ALL COSTS ASSOCIATED WITH FORMING AND POURING STEP TO BE INCLUDED IN: Sidewalk, Conc, 4 inch - Sft

LEGEND

	PROPOSED SIDEWALK
	ADA SIDEWALK RAMP

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PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES (IN CONFLICT WITH PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. CALL MISS DIG 3 WORKING DAYS PRIOR TO CONSTRUCTION.



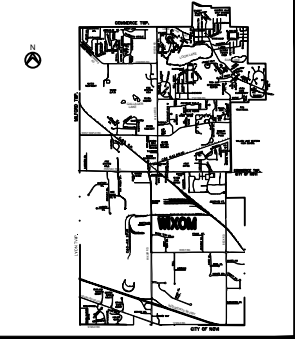
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CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM

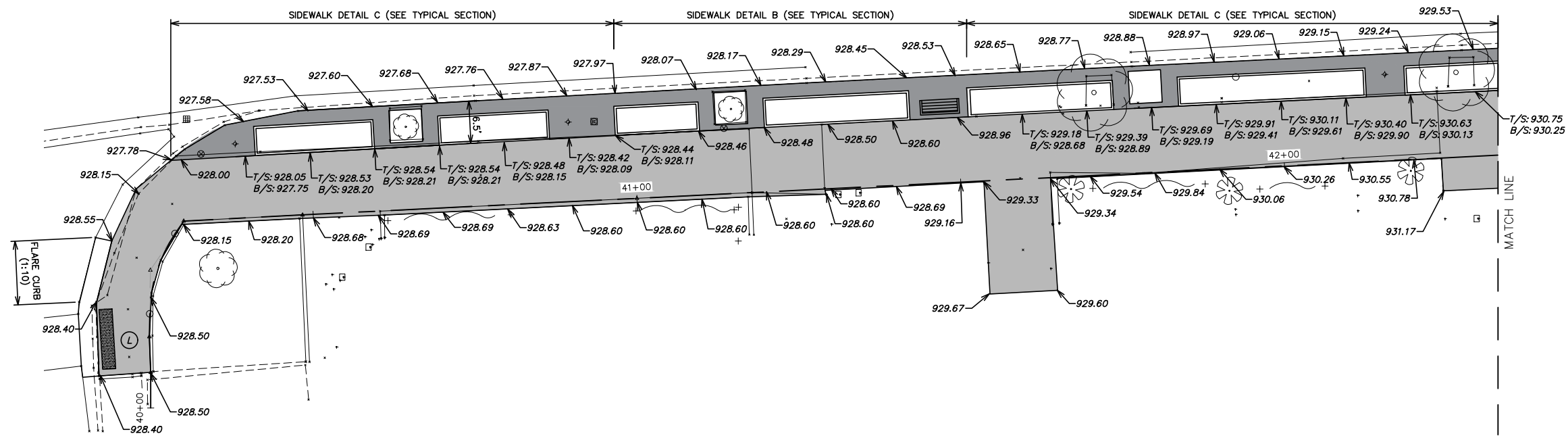
CONSTRUCTION SHEET

HRC JOB NO. 20220938	SCALE 1" = 20'
DATE FEB 2023	SHEET NO. 6

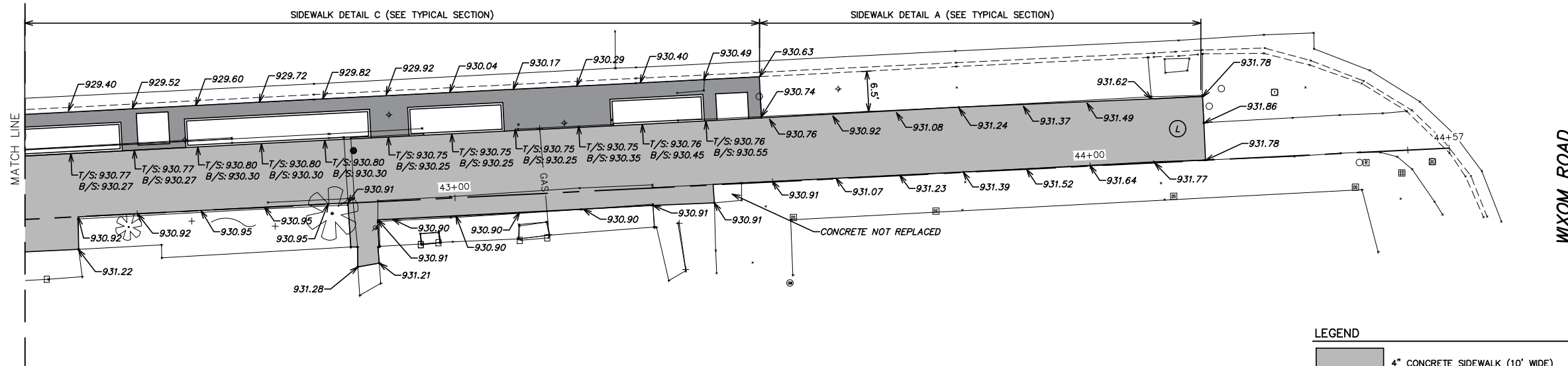


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PONTIAC TRAIL

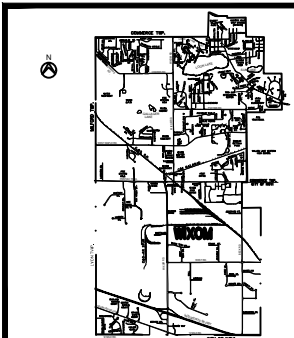


NOTES

- ① ALL COSTS ASSOCIATED WITH FORMING AND POURING STEP TO BE INCLUDED IN: Sidewalk, Conc, 4 inch - Sft
- ② FOR LOCATIONS WHERE PLANTER BOX IS PROPOSED, CONTRACTOR TO FORM SIDEWALK TO ACCOMMODATE PLANTER BOX. SEE DETAIL SHEET, CONSTRUCTION AND LANDSCAPE PLAN FOR MORE INFORMATION.

LEGEND

- 4" CONCRETE SIDEWALK (10' WIDE)
- 4" CONCRETE SIDEWALK (6.5' WIDE)
- XXX.XX PROPOSED GRADE
- T/S TOP OF STEP
- B/S BOTTOM OF STEP
- LANDING
- RAMP
- DETECTABLE WARNING SURFACE



CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM

DETAIL GRADES
 PONTIAC TRAIL WEST

HRC JOB NO. 20220938	SCALE 1"= 10'
DATE FEB 2023	SHEET NO. 7



DEPARTMENT OF PUBLIC SERVICES

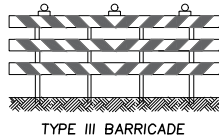
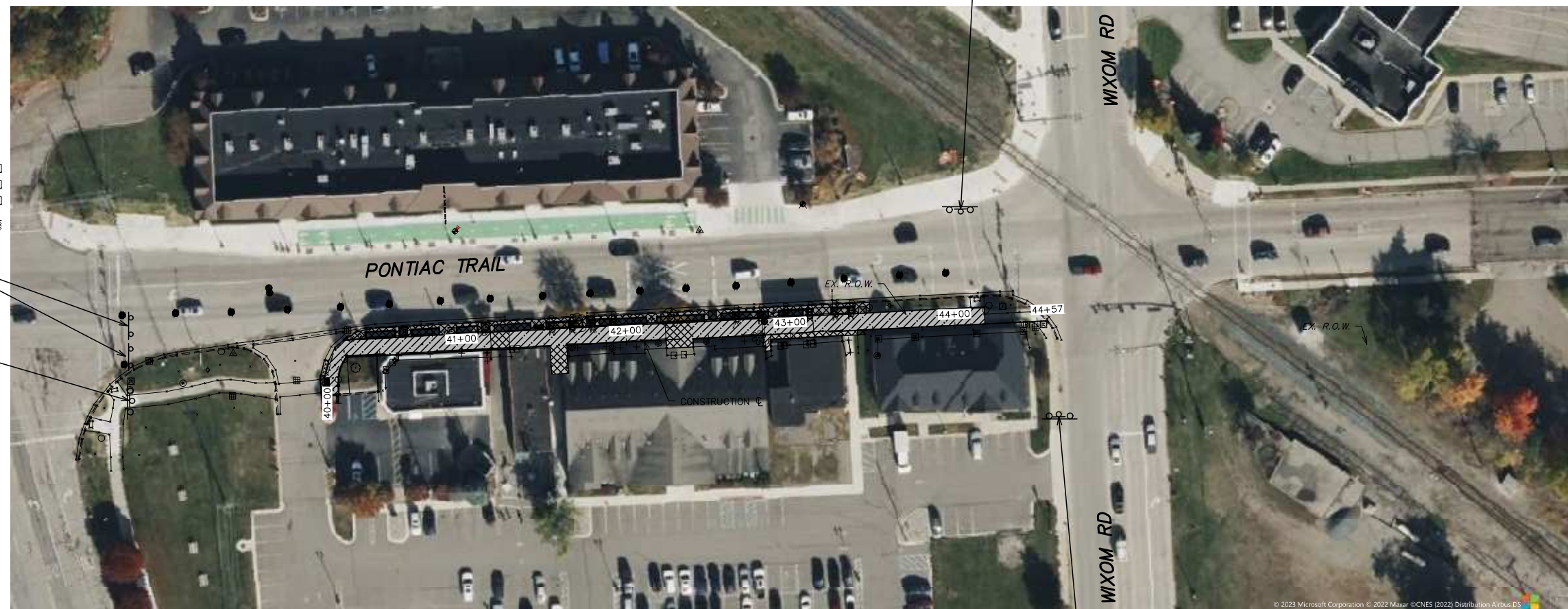
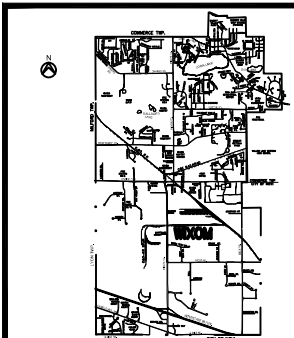
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DRAWN	LG/PLK
CHECKED	AM
APPROVED	



TYPE III BARRICADE



R9-9



R9-9

SEQUENCE OF CONSTRUCTION (PONTIAC TRAIL STA 40+00 TO STA 44+57):

- REMOVE EXISTING BRICK PAVERS, SIDEWALK, AND RAMPS WHERE SHOWN (DELIVER BRICK PAVERS TO DPW)
- INSTALL PROPOSED IRRIGATION
- EARTHWORK FOR PROPOSED SIDEWALK AND RAMPS
- LAY AND COMPACT PROPOSED GRANULAR MATERIAL
- CONSTRUCT PLANTERS AND OTHER LANDSCAPING FEATURES (INCLUDING MARKED TREES ON THE NORTH SIDE OF PONTIAC TRAIL)
- FORM AND POUR PROPOSED SIDEWALK AND SIDEWALK RAMPS WITH DETECTABLE WARNING SURFACE
- FINISH GRADE AND ESTABLISH TURF

MAINTAINING TRAFFIC NOTES:

1. IT IS NOT THE INTENT OF THE PROJECT TO CLOSE PONTIAC TRAIL FOR THE DURATION OF THE WORK ALONG PONTIAC TRAIL. DETOUR CAN BE IMPLEMENTED ONLY WHEN DEEMED NECESSARY BY ENGINEER (I.E. DURING REMOVAL OF EXISTING SIDEWALK IN ORDER TO LOAD AND HAUL EXISTING MATERIALS AND WHEN POURING NEW SIDEWALK).
2. IT IS INTENDED FOR PONTIAC TRAIL TO BE OPEN TO TRAFFIC WHILE ALL OTHER WORK IS PERFORMED.
3. PONTIAC TRAIL CAN ONLY BE CLOSED BETWEEN THE HOURS OF 9 A.M. AND 4 P.M. AFTER 4 P.M., THE DETOUR MUST BE REMOVED.

NOTE:

ALL CONSTRUCTION SIGNS SHALL BE SPACED PER MDOT TRAFFIC AND SAFETY TYPICALS. (SEE MAINTAINING TRAFFIC SPEC 02550.)
SEE DETOUR PLAN FOR ADDITIONAL SIGNAGE

LEGEND

- PROPOSED CONSTRUCTION
- DRUM CHANNELIZING DEVICE
- TYPE II PEDESTRIAN BARRICADE

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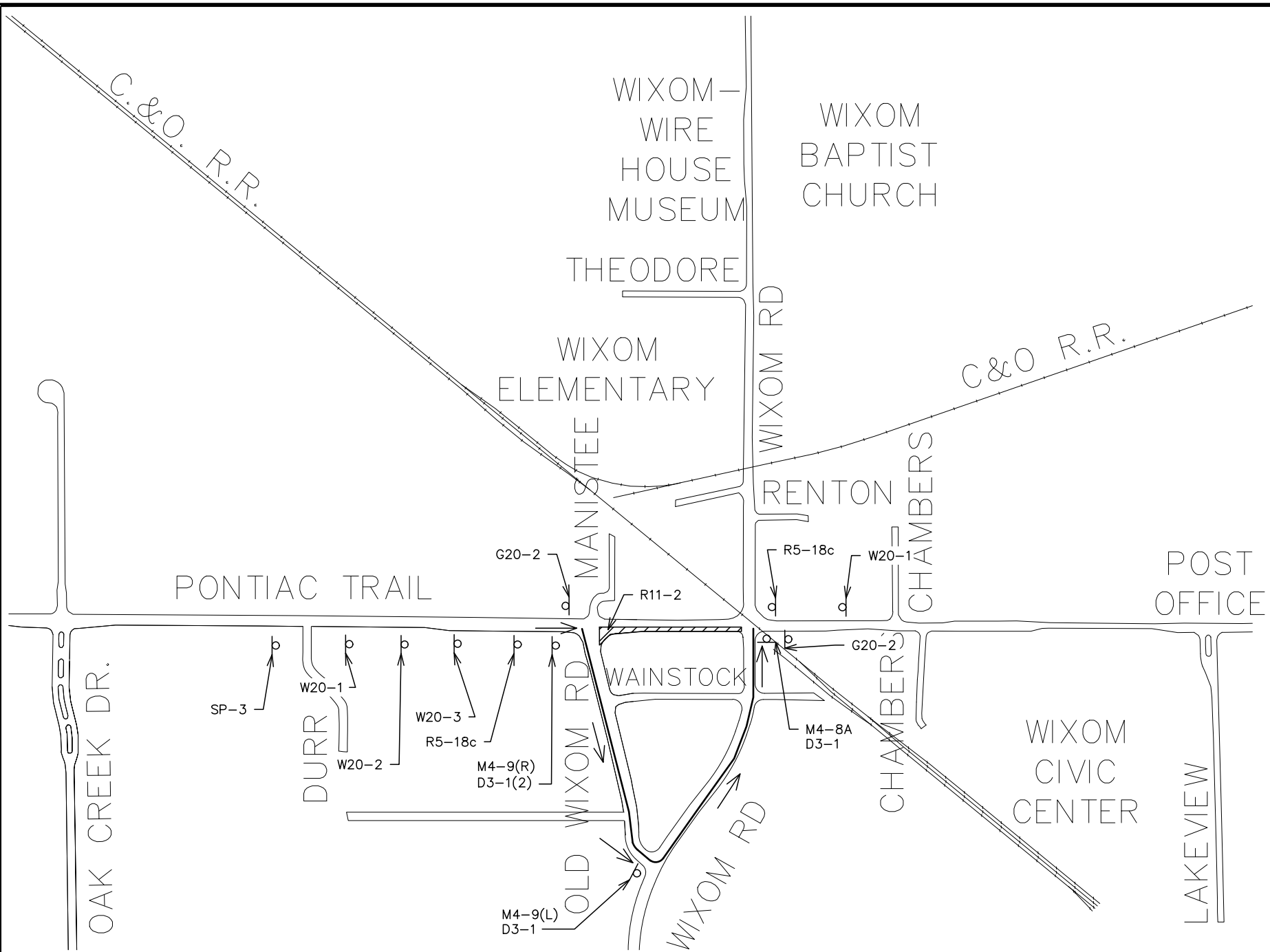


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2023 SIDEWALK IMPROVEMENTS PROGRAM

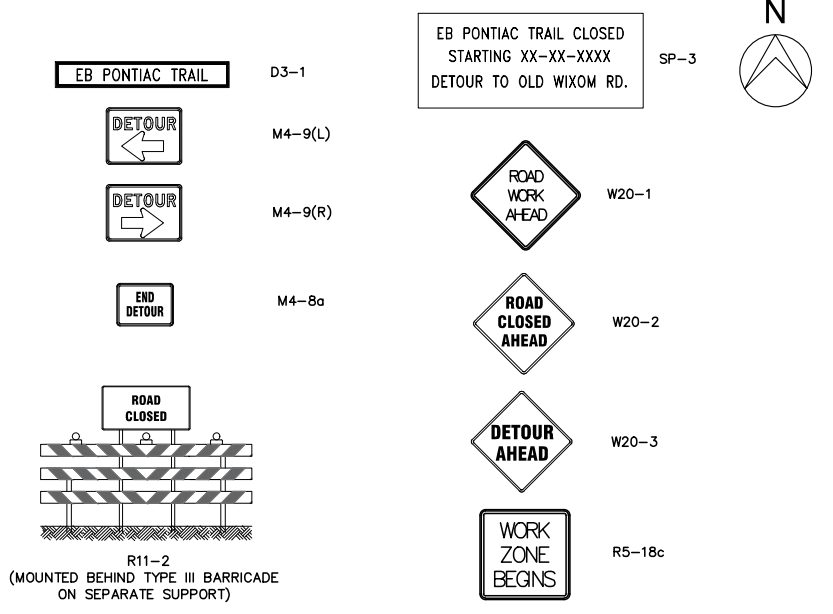
MAINTENANCE OF TRAFFIC

HRC JOB NO.	SCALE
20220938	1"= 40'
DATE	SHEET NO.
FEB 2023	8



CONSTRUCTION SIGNING NOTES:

- ALL TRAFFIC CONTROL DEVICES INCLUDING SIGNS, BARRICADES, VERTICAL PANELS, DRUMS, WARNING LIGHTS, ARROW BOARDS, AND CHANGEABLE MESSAGE SIGNS SHALL MEET THE "ACCEPTABLE" REQUIREMENTS OF AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA), "QUALITY STANDARD FOR WORK ZONE TRAFFIC CONTROL DEVICES - CURRENT EDITION". COPIES OF THIS PUBLICATION ARE AVAILABLE DIRECTLY FROM ATSSA. ALL TRAFFIC CONTROL DEVICES SHALL BE IN LIKE-NEW CONDITION.
- SIGN LOCATIONS AND DISTANCES BETWEEN SIGNS WILL BE FIELD REVIEWED BY THE ENGINEER BEFORE INSTALLATION TO ASSURE APPROPRIATE PLACEMENT. THE LOCATION OF THE CONSTRUCTION SIGNING SHALL BE CLEARLY MARKED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF ONE WEEK IN ADVANCE OF THE NEED FOR REVIEW. THIS WORK WILL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE PROJECT.
- ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE 2011 MMUTCD. ALL CONSTRUCTION SIGNING SHALL BE BLACK LETTERS ON FLORESCENT ORANGE BACKGROUND UNLESS SPECIFIED OTHERWISE.
- ALL TRAFFIC SIGNS WITHIN THE PROJECT WILL BE RELOCATED BY THE CONTRACTOR FOR EACH STAGE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN ALL TRAFFIC CONTROL DEVICES WITHIN THE PROJECT LIMITS. ANY TRAFFIC CONTROL DEVICES DAMAGED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE. THE CONTRACTOR WILL BE CHARGED FOR ANY DAMAGED TRAFFIC CONTROL DEVICES DUE TO THE CONTRACTOR'S OPERATION, WHICH ARE REPAIRED OR REPLACED BY THE CITY OF WIXOM.
- AS DIRECTED BY THE TRAFFIC OPERATION ENGINEER, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ANY ADDITIONAL SIGNS, BARRICADES AND LIGHTS WITHIN THE PROJECT TO PROTECT THE TRAFFIC AND WORK AREA.
- THE CONTRACTOR SHALL PLACE A MINIMUM OF EIGHT SANDBAGS ON CONTRACTOR FURNISHED TYPE III BARRICADES TO PREVENT MOVEMENT. ALL TYPE III BARRICADES SHALL BE DOUBLE SIDED.
- CONSTRUCTION SIGNING MOUNTED ON PORTABLE SUPPORTS SHOULD NOT BE USED FOR A DURATION OF MORE THAN FOURTEEN (14) DAYS. OTHERWISE, SIGNS SHALL BE GROUND MOUNTED ON 3 LB U-CHANNEL POSTS WHEN POSSIBLE. THE FOLLOWING SIGNS MAY BE PLACED ON TEMPORARY SUPPORTS: SIGNS PLACED IN CONJUNCTION WITH THE TYPE III BARRICADES, SIGNS PLACED FOR SIDEWALK CLOSURE, AND SIGNS WITHIN THE CLOSED PORTION OF ROADWAY ITSELF. THE CONTRACTOR SHALL INSTALL ONE FLASHER ON ANY CONSTRUCTION SIGN THAT IS INSTALLED ON TEMPORARY SUPPORTS.
- ALL SIGNS PLACED IN CONJUNCTION WITH A TYPE III BARRICADE SHALL BE PLACED ON SEPARATE SUPPORTS IMMEDIATELY BEHIND AND ABOVE THE TYPE III BARRICADE. THESE SIGNS SHALL BE INSTALLED ON TEMPORARY SUPPORTS. THE CONTRACTOR SHALL PLACE A MINIMUM OF EIGHT SANDBAGS ON THESE SIGNS TO PREVENT MOVEMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COVERING AND UNCOVERING ALL CONSTRUCTION SIGNS AS NEEDED FOR THE PROPER MAINTENANCE OF TRAFFIC THROUGHOUT THE CONSTRUCTION AREA.
- TRAFFIC CONTROL SIGNS AND STREET NAME SIGNS SHALL BE REMOVED, SALVAGED, RELOCATED AND MAINTAINED BY THE CONTRACTOR AS INDICATED ON THE PLANS. THIS WORK MAY BE REQUIRED MULTIPLE TIMES DURING THE PROJECT TO ACCOMMODATE CONSTRUCTION OPERATIONS. THIS WORK SHALL BE PERFORMED ON THE SAME DAY OF A CHANGE IN OPERATIONS REQUIRING THE SIGN WORK AS DETERMINED AND/OR APPROVED BY THE PROJECT ENGINEER. UPON COMPLETION OF THE PROJECT, PERMANENT TRAFFIC CONTROL SIGNS WILL BE RELOCATED OR REPLACED IN THEIR PROPER POSITION BY RCOC OR THE CONTRACTOR AS INDICATED ON THE PLANS. THE SIGN REMOVAL, SALVAGING, RELOCATING, INSTALLATION, AND RELATED WORK WILL BE PAID FOR WITH THE APPROPRIATE PAY ITEM, AT THE CONTRACT UNIT PRICES EACH TIME THE WORK IS DETERMINED TO BE NECESSARY BY THE PROJECT ENGINEER TO ACCOMMODATE CONSTRUCTION OPERATIONS.
- ANY OTHER SIGNS WHICH THE CONTRACTOR MAY BE REQUIRED TO FURNISH SHALL CONFORM TO THE 2011 MUTCD. THE CONTRACTOR SHALL NOT BEGIN ANY OPERATIONS ON THE PROJECT UNTIL ALL OF THE STOP SIGNS AND STREET NAME SIGNS HAVE BEEN RELOCATED AND FLASHER LIGHTS ARE ATTACHED TO ALL REQUIRED SIGNS AND BARRICADES.
- TRAFFIC CHANNELING DEVICES (PLASTIC BARRELS) FURNISHED BY THE CONTRACTOR FOR WORK PROTECTION SHALL BE COATED WITH REFLECTORIZED MATERIAL AND AT SPACING BASED ON POSTED SPEED LIMIT AND PER THE 2011 MMUTCD.

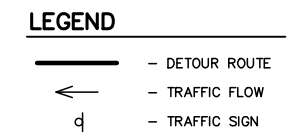


NOTE:
ALL CONSTRUCTION SIGNS SHALL BE SPACED PER MDOT TRAFFIC AND SAFETY TYPICALS. (SEE MAINTAINING TRAFFIC SPEC 02550.)

MAINTAINING TRAFFIC NOTES:

- IT IS NOT THE INTENT OF THE PROJECT TO CLOSE PONTIAC TRAIL FOR THE DURATION OF THE WORK ALONG PONTIAC TRAIL. DETOUR CAN BE IMPLEMENTED ONLY WHEN DEEMED NECESSARY BY ENGINEER (I.E. DURING REMOVAL OF EXISTING SIDEWALK IN ORDER TO LOAD AND HAUL EXISTING MATERIALS AND WHEN POURING NEW SIDEWALK).
- IT IS INTENDED FOR PONTIAC TRAIL TO BE OPEN TO TRAFFIC WHILE ALL OTHER WORK IS PERFORMED.
- PONTIAC TRAIL CAN ONLY BE CLOSED BETWEEN THE HOURS OF 9 A.M. AND 4 P.M. AFTER 4 P.M., THE DETOUR MUST BE REMOVED.

QUANTITIES - OVERALL		
Item Description	Qty	Unit
Barricade, Type III, High Intensity, Double Sided, Furn	4	Ea
Barricade, Type III, High Intensity, Double Sided, Oper	4	Ea
Pedestrian Type II Barricade, Temp	2	Ea
Channelizing Device, 42 inch, Furn	50	Ea
Channelizing Device, 42 inch, Oper	50	Ea
Minor Traf Devices	1	LS
Plastic Drum, High Intensity, Furn	50	Ea
Plastic Drum, High Intensity, Oper	50	Ea
Sign, Type B, Temp, Prismatic, Furn	373	Sft
Sign, Type B, Temp, Prismatic, Oper	373	Sft
Sign, Type B, Temp, Prismatic, Special, Furn	72	Sft
Sign, Type B, Temp, Prismatic, Special, Oper	72	Sft
Lighted Arrow, Type C, Furn	1	Ea
Lighted Arrow, Type C, Oper	1	Ea
Traf Regulator Control	1	Lsum



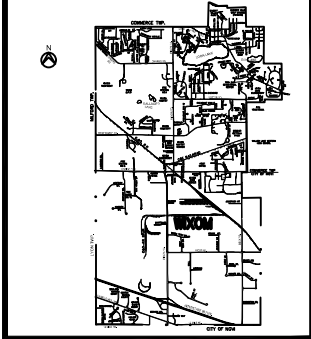
NOTE:
UTILITY INFORMATION ON THIS DRAWING MAY BE FROM INFORMATION DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANIES, CITY/COUNTY AGENCIES AND OTHER VARIOUS SOURCES. UNDERGROUND UTILITIES WHICH ARE ON PRIVATE PROPERTY ARE USUALLY NOT DELINEATED UPON A UTILITY COMPANY'S PUBLISHED PLANS. THEIR LOCATION, IF SHOWN UPON THIS SURVEY, ARE APPROXIMATED FROM FOUND PAINT MARKS/STAKES, ETC. AS LOCATED BY THIS FIRM FROM SOURCES WHICH ARE UNKNOWN. NO GUARANTEE IS GIVEN AS TO THE COMPLETENESS OR ACCURACY THEREOF.
PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES (IN CONFLICT WITH PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. CALL MISS DIG 3 WORKING DAYS PRIOR TO CONSTRUCTION.



City of WIXOM
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2/28/2023	ISSUED FOR BIDS
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LG/AM
DRAWN	LG/AM
CHECKED	AM
APPROVED	



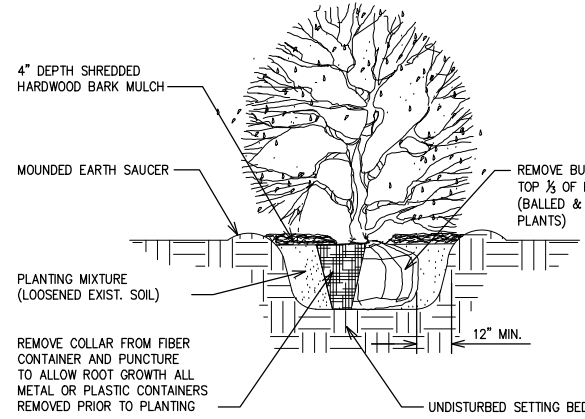
CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM

DETOUR ROUTE
PONTIAC TRAIL

HRC JOB NO. 20220938	SCALE No Scale
DATE FEB 2023	SHEET NO. 9

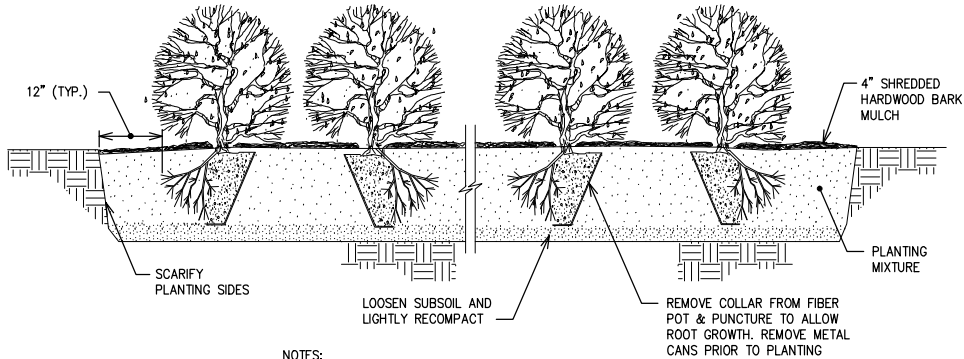
LANDSCAPE NOTES:

- VERIFY ALL CONDITIONS ON SITE PRIOR TO COMMENCING CONSTRUCTION AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER OR OWNER.
- VERIFY THE LOCATION OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES PRIOR TO COMMENCING WORK. CONTRACTOR IS RESPONSIBLE FOR ANY COST INCURRED DUE TO DAMAGED UTILITIES.
- THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES REFLECTED ON THE PLANT LIST. IF A DISCREPANCY EXISTS BETWEEN THE LIST AND THE PLAN, THE PLAN SHALL BE HELD VALID.
- INSTALLATION AND SIZE OF ALL PLANT MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARDS SET FORTH BY THE 'AMERICAN NURSERY AND LANDSCAPE ASSOCIATION'.
- THE LANDSCAPE CONTRACTOR SHALL CONTACT THE ENGINEER OR THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION. DISCREPANCIES BETWEEN THE PLANS AND ACTUAL SITE CONDITIONS SHALL BE RESOLVED AT THIS TIME.
- THE LOCATION OF ALL PLANTS SHALL BE STAKED IN THE FIELD AND APPROVED BY OWNER PRIOR TO PLANTING.
- IF ROUGH GRADE IS DONE BY OTHERS, THE CONTRACTOR SHOULD REVIEW THAT GRADE AND ADDRESS ANY PROBLEMS WITH THE OWNER. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL GRADING AND SITE SURFACE DRAINAGE, DRAINAGE TO PAVING, CATCH BASINS ETC. NO LOW SPOTS THAT HOLD STANDING WATER WILL BE ACCEPTED.
- WATER IN ALL PLANT MATERIAL IMMEDIATELY AFTER INSTALLATION.
- ALL PLANTING BEDS SHALL HAVE A PRE-EMERGENT HERBICIDE, 'RONSTAR' (OR APPROVED EQUAL) APPLIED PER MANUFACTURER'S INSTRUCTIONS. SUBMIT LABELS TO THE PROJECT ENGINEER FOR APPROVAL.
- SUBMIT SAMPLES OF MULCH, TOPSOIL, STONE, ETC. AS REQUIRED BY THE PROJECT ENGINEER.
- THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR SUPPLY AND PLACEMENT OF TOPSOIL PER SPECIFICATIONS.
- ALL TREES SHALL HAVE CLAY LOAM ROOT BALLS. NO SAND BALLS WILL BE ACCEPTED.
- DIG SHRUB PIT A MINIMUM OF 1 FOOT LARGER THAN SHRUB ROOT BALLS AND TREE PITS 2 FEET LARGER THAN ROOT BALLS. BACKFILL WITH TWO PARTS TOP SOIL, TWO PARTS SOIL FROM EXCAVATED PLANTING HOLE AND ONE PART PEAT. PLANT TREES AND SHRUBS AT THE SAME GRADE LEVEL AT WHICH THEY WERE PLANTED AT THE NURSERY. IF WET CLAY SOILS ARE EVIDENT, PLANT TREES AND SHRUBS HIGHER.
- REMOVE ALL TWINE, WIRE AND BURLAP FROM THE TOP 1/3 OF TREE AND SHRUB EARTH BALLS AND FROM TREE TRUNKS. REMOVE ALL NON-BIODEGRADABLE MATERIAL SUCH AS PLASTIC OR NYLON COMPLETELY.
- PLANTER BOXES ARE TO BE MULCHED WITH SHREDDED BARK MULCH TO A MINIMUM DEPTH OF 4 INCHES. ONLY NATURAL COLORED, SHREDDED HARDWOOD BARK MULCH WILL BE ACCEPTED.
- UPON COMPLETION, ALL PLANT MATERIALS MUST BE PRUNED AND INJURIES REPAIRED. THE AMOUNT OF PRUNING SHALL BE LIMITED TO THE MINIMUM NECESSARY TO REMOVE DEAD OR INJURED TWIGS AND BRANCHES AND TO COMPENSATE FOR THE LOSS OF ROOTS FROM TRANSPLANTING. ALL CUTS SHALL BE MADE FLUSH, LEAVING NO STUBS.
- THE CONTRACTOR AGREES TO WARRANTY ALL PLANTS FOR TWO (2) YEARS FROM THE TIME OF PLANTING AND FINAL INSPECTION BY THE OWNER'S REPRESENTATIVE. THIS WARRANTY INCLUDES FURNISHING NEW PLANTS AS WELL AS THE LABOR AND MATERIALS FOR THE INSTALLATION OF REPLACEMENTS. ALL REPLACEMENT PLANTS SHALL BE GUARANTEED FOR AN ADDITIONAL PERIOD OF ONE (1) YEAR.
- PLANT MATERIAL WITH 25% OR GREATER DIE BACK, AS DETERMINED BY THE OWNER'S REPRESENTATIVE, SHALL BE REPLACED AS STIPULATED ABOVE.
- SEE PROJECT DETAIL SHEET FOR PLANTER BOX DETAIL



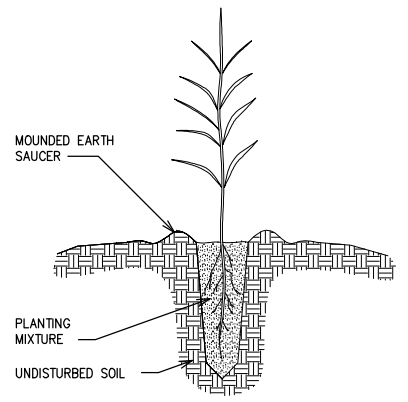
NOTE:
SHRUB SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT DID TO PREVIOUS EXISTING GRADE.

SHRUB PLANTING
NO SCALE

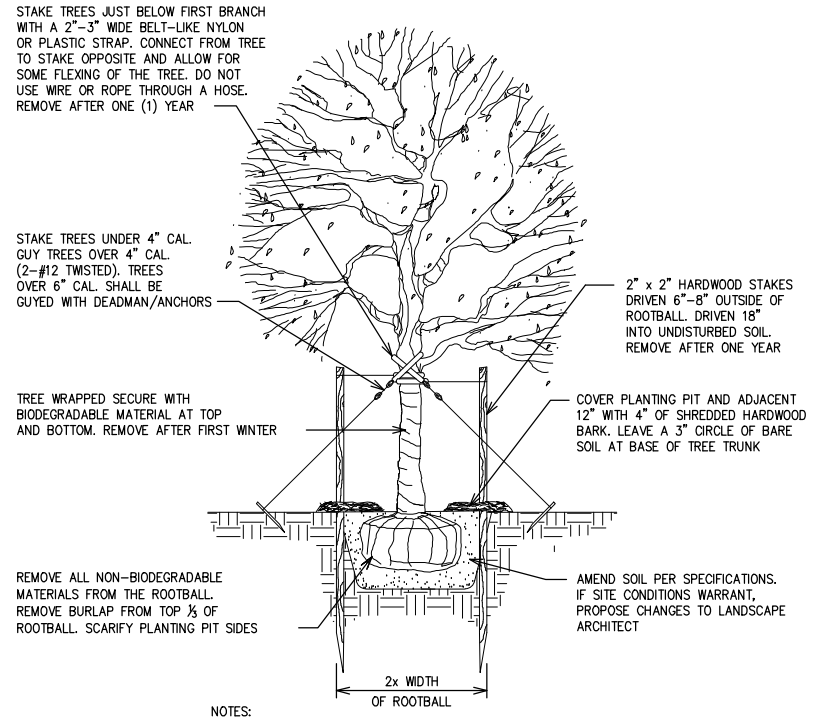


NOTES:
HEDGE PLANTING TRENCH SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF THE HEDGE.
REMOVE BURLAP FROM TOP 1/3 OF ROOTBALL ON B&B SHRUBS.
SHRUBS SHALL BEAR SAME RELATION TO FINISH GRADE AS THEY DID TO NURSERY GRADE.

MASSED SHRUB PLANTING
NO SCALE

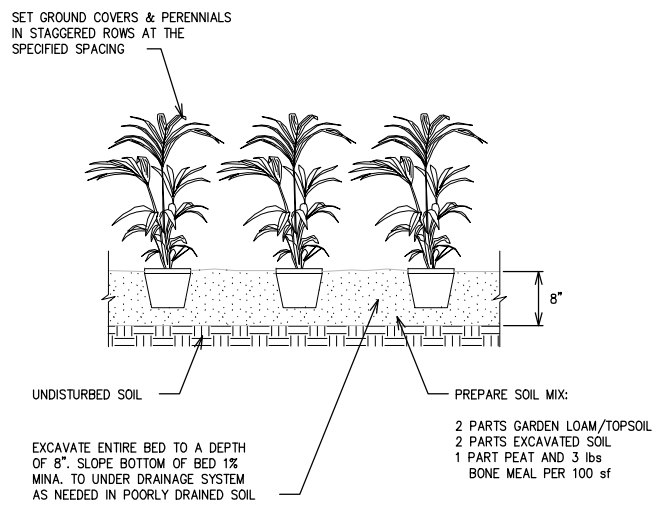


PLANT PLUG
NO SCALE



NOTES:
REMOVE SECONDARY LEADERS. DO NOT PRUNE TERMINAL LEADER OR BRANCH TIPS. PRUNE ALL DEAD AND BROKEN BRANCHES.
REMOVE ALL TAGS, STRINGS, PLASTICS AND ANY OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
SAME STANDARDS APPLY FOR EVERGREEN AND ORNAMENTAL TREES.

DECIDUOUS TREE PLANTING
NO SCALE



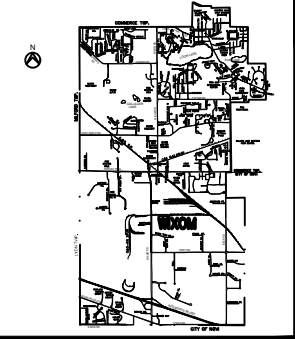
GROUND COVER, PERENNIAL AND FLOWER PLANTINGS
NO SCALE



DEPARTMENT OF PUBLIC SERVICES

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CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM

LANDSCAPE NOTES AND DETAILS

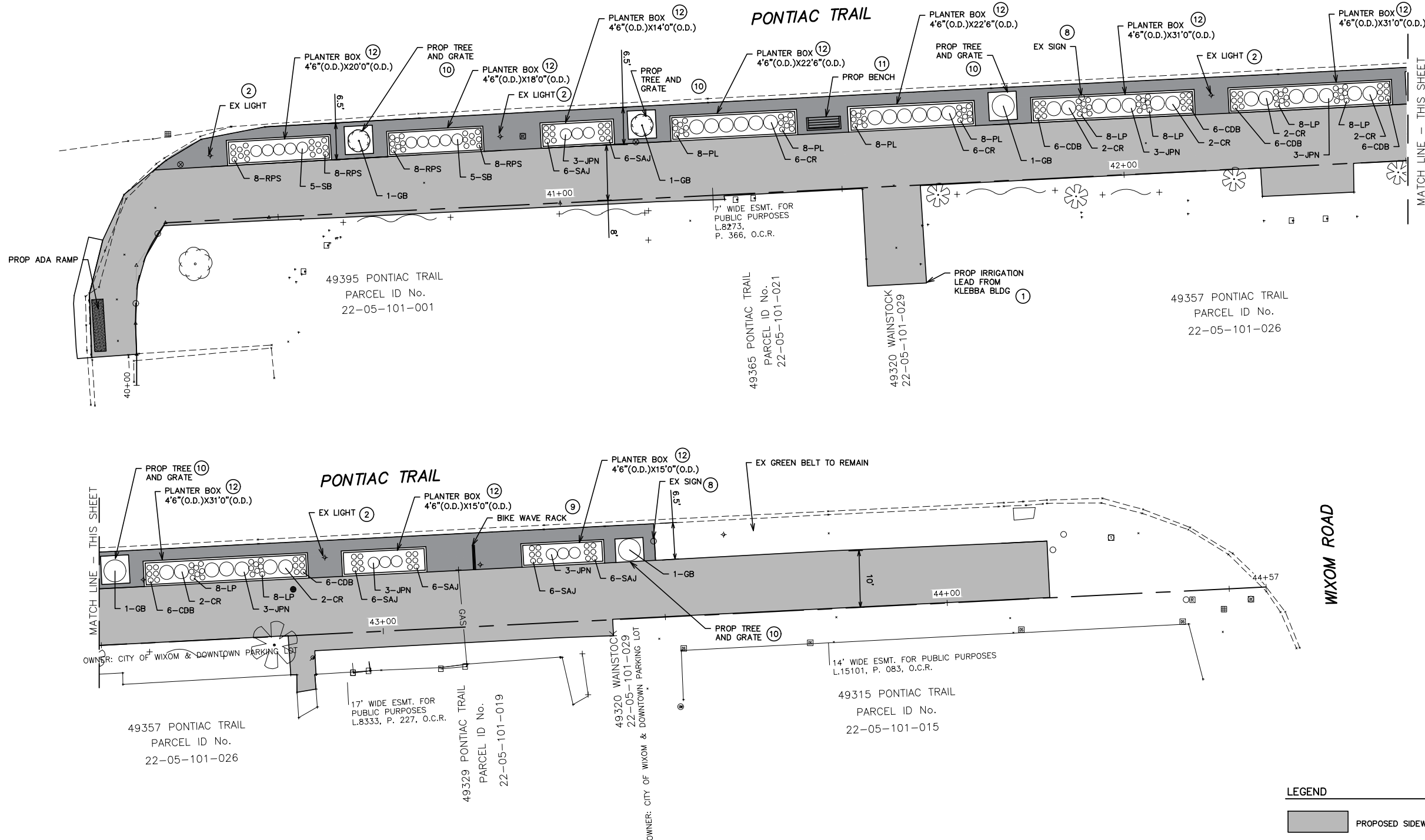
HRC JOB NO. 20220938	SCALE N/A
DATE FEB 2023	SHEET NO. 10

- NOTE:
- ALL EXISTING PLANTER BOXES TO BE REMOVED - PROP PLANTERS TO BE IRRIGATED. SEE IRRIGATION SPEC FOR INFORMATION.
 - EXISTING LIGHT POLES TO REMAIN
 - ALL EXISTING TREES TO BE REMOVED AS SHOWN ON REMOVAL SHEET.
 - PLANTER BOX OFFSET 2' FROM B/C
 - FRONT OF WALK 6.5' FROM B/C
 - SIDEWALK MAXIMUM CROSS SLOPE = 2%
 - PLANTER AREA MAXIMUM CROSS SLOPE = 1:12 = 8.33%
 - EXISTING SIGNS ALONG PONTIAC TRAIL TO BE REMOVED, SALVAGED AND REINSTALLED. PAID FOR AS: SIGN, TYPE III, ERECT, SALV - Ea.
 - BIKE RACK (SEE SPECIAL PROVISION FOR INFORMATION).
 - TREE GRATE (SEE SPECIAL PROVISION FOR INFORMATION).
 - BENCH SEAT (SEE SPECIAL PROVISION FOR INFORMATION).
 - PLANTER WALLS TO BE CONSTRUCTED WITH BLOCKS AS SUPPLIED BY UNILOCK.
 - STYLE: LINEO DIMENSIONAL STONE
 - COLOR: SIERRA
 - SIZE: VARIOUS SIZES WITH RANDOM PLACEMENT PER MANUFACTURER SPECIFICATIONS.
 - PLANTER WALLS TO HAVE XL RECTANGLE UNITS PLACED AS CAP.
 - INSTALL PER MANUFACTURERS SPECIFICATION.
 - TOP OF WALL HEIGHT: 16" ABOVE SIDEWALK GRADE
 - ALL EXISTING LANDSCAPE/PLANTS ADJACENT TO BUILDINGS TO REMAIN

QUANTITIES - THIS SHEET		
Item Description	Qty	Unit
Shredded Hardwood Bark Mulch	15	Cyd
Coreopsis x Verticilla 'Daybrake' -1 Gal	36	Ea
Rose 'Knockout' Carpet Rose -3 Gal	24	Ea
Juniperus Pro. 'Nana' Japanese Garden Juniper -3 Gal	18	Ea
Lavandula x Inter. 'Phenomenal' Lavendar -1 Gal	48	Ea
Campanula Carpathion - Bellflower -1 Gal	32	Ea
Rudbeckia 'Praire Sun' -1 Gal	32	Ea
Sedums 'Autumn Joy' -1 Gal	36	Ea
Spirea x Bumalda 'Anthony Waterer' -3 Gal	10	Ea
Ginko Biloba -1.5" Cal B&B	5	Ea
Bike Rack, Special	1	Ea
Bench, Special	1	Ea
Planter Box, Special	530	Ft
Plant Mix, Special	75	Cyd
Tree Grate with Tree Guard, Special	5	Ea
Turf Establishment, Special	50	Syd
Irrigation System, Special	30,000	Dir

PLANT LIST		
BOTANICAL NAME	KEY	SIZE
Coreopsis x Verticilla 'Daybrake'	CDB	1 GAL
Rose 'Knockout' Carpet Rose	CR	3 GAL
Juniperus Pro. 'Nana' Japanese Garden Juniper	JPN	3 GAL
Lavandula x Inter. 'Phenomenal' Lavendar	LP	1 GAL
Campanula Carpathion - Bellflower	PL	1 GAL
Rudbeckia 'Praire Sun'	RPS	1 GAL
Sedums 'Autumn Joy'	SAJ	1 GAL
Spirea x Bumalda 'Anthony Waterer'	SB	3 GAL
Ginko Biloba	GB	1.5" CAL B&B

BENCHMARK		
BM. #	DESCRIPTION	ELEV.
302	ARROW ON HYDRANT NORTH SIDE OF PONTIAC TRAIL 50' +/- EAST OF BUILDING #49348	933.07
303	TOP OF SOUTH EDGE OF CONCRETE LIGHT POLE BASE NORTH SIDE OF PONTIAC TRAIL AT BUILDING #49378	928.28

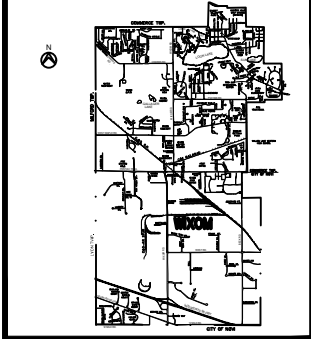


LEGEND	
	PROPOSED SIDEWALK

City of WIXOM
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DRAWN	
CHECKED	
APPROVED	



CITY OF WIXOM
2023 SIDEWALK IMPROVEMENTS PROGRAM
 LANDSCAPE PLAN

HRC JOB NO. 20220938	SCALE 1" = 10'(22X34) 1" = 20'(11X17)
DATE FEB 2023	SHEET NO. 11

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DESIGN FILE - V:\20100201\2007V\C\general\Rev\std_11-12-2012.dgn

USER NAME - d.james

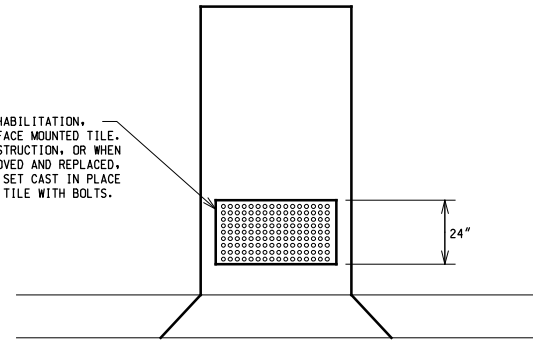
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CL/F.TBL - I:\MPS\@planting\@biostruct\creator.ctb

PEM.TBL - I:\MPS\@planting\@biostruct\creator.ctb

TIME - 21-Mar-2013 13:59

FOR RAMP REHABILITATION, USE RED SURFACE MOUNTED TILE. FOR NEW CONSTRUCTION, OR WHEN RAMP IS REMOVED AND REPLACED, USE RED WET SET CAST IN PLACE REPLACEABLE TILE WITH BOLTS.

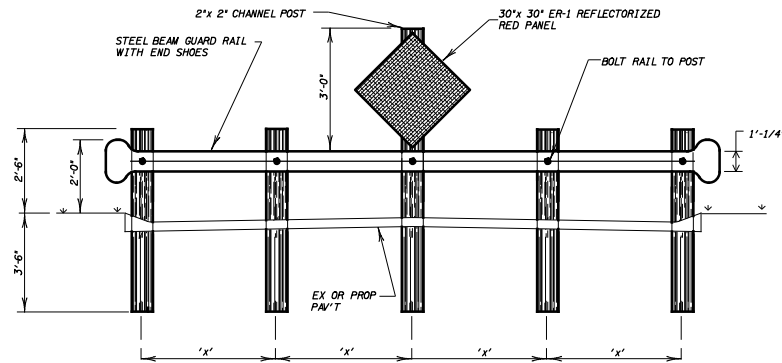


RED PREFABRICATED TRUNCATED DOME ADA TILE DETAIL

MANUFACTURED BY ADA SOLUTIONS, INC.

NOTES:

1. SURFACE APPLIED TACTILE PANELS SHALL BE MECHANICALLY FASTENED AND ADHERED TO THE UNDERLYING SUBSTRATE.
2. LOCATION OF ADA TILE TO MEET CURRENT MDT STANDARDS FOR DETECTABLE WARNINGS AND SHALL BE APPROVED BY CITY DPM.
3. THE ALIGNMENT OF THE NEW TILE SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL TO THE OPPOSITE RAMP.

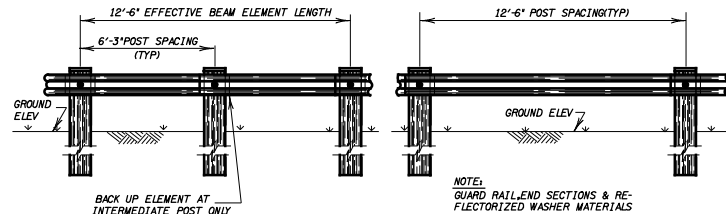


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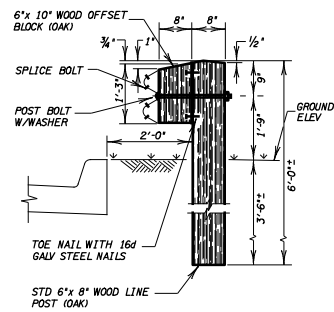
1. STEEL W6x9 x 6'-0" MAY REPLACE OAK POST
2. CHANNEL TO BE BOLTED TO OAK POSTS OR BOLTED TO OAK POSTS.
3. GUARD RAIL & FITTINGS TO CONFORM TO M.D.T. STANDARDS

WIDTH OF PAVT	X	NO OF POSTS
27FT B/B	6'-0"	5
36FT B/B	5'-6"	7

ROAD END STEEL BEAM GUARD RAIL



BEAM GUARDRAIL - TYPE 'B'



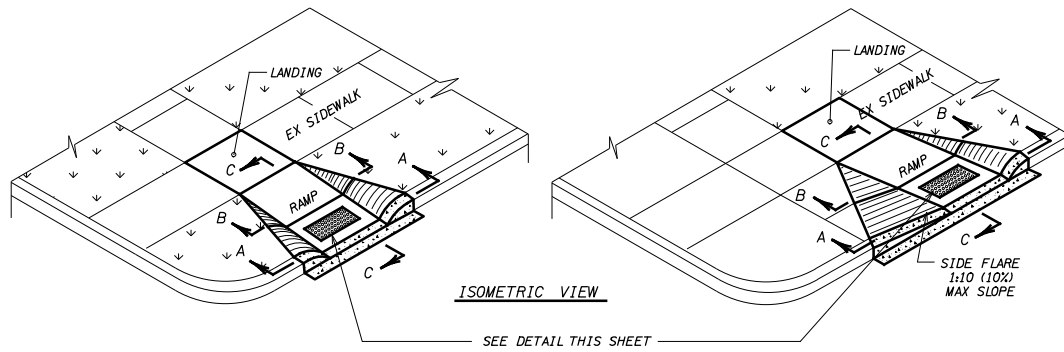
MAIL-BOX LOCATION

NOTES:

1. HEIGHT OF MAILBOX IS 42" FROM SURFACE OF ROAD
2. ON ROADS WITH GRAVEL SHOULDERS, LOCATE FACE OF MAILBOX 6" FROM EDGE OF SHOULDER.
3. ON ROADS WITH SOD SHOULDERS, LOCATE FACE OF MAILBOX 6" FROM EDGE OF PAVEMENT.
4. ROADS WITH CURBS, LOCATE FACE OF MAILBOX 6" FROM BACK OF CURB.

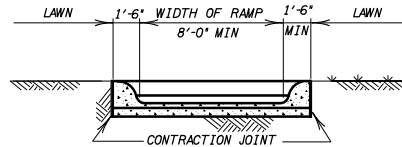
ADA CONCRETE SIDEWALK RAMPS

NOTE: MAX SIDEWALK AND RAMP CROSS-SLOPE IS 2.0%. MAX LANDING SLOPE IS 2.0% IN ALL DIRECTIONS.

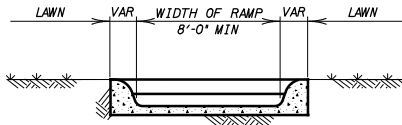


TYPE 1

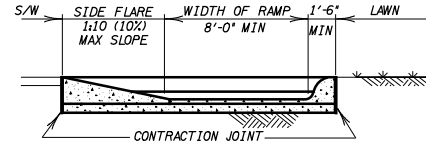
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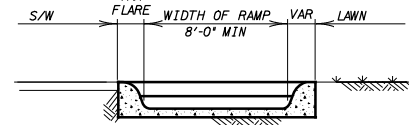
SECTION A-A



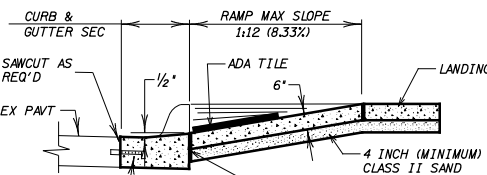
SECTION B-B



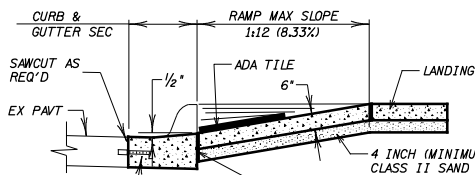
SECTION A-A



SECTION B-B



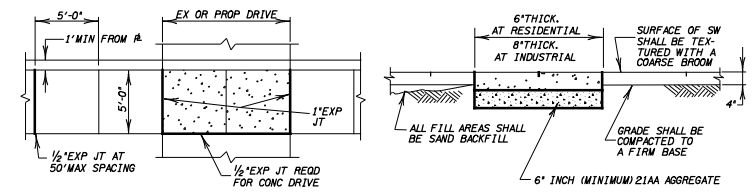
SECTION C-C



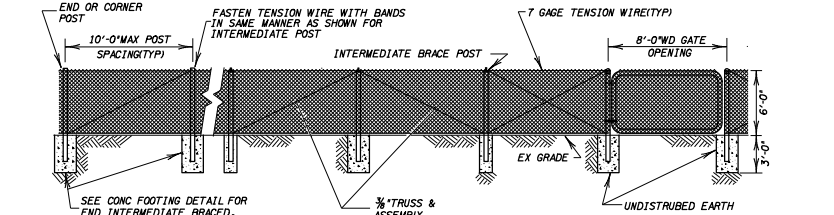
SECTION C-C

NOTE: PLACE EXPANSION JOINT AT B/C LINE OR SIDEWALK JOINT

NOTE: PLACE EXPANSION JOINT AT B/C LINE OR SIDEWALK JOINT



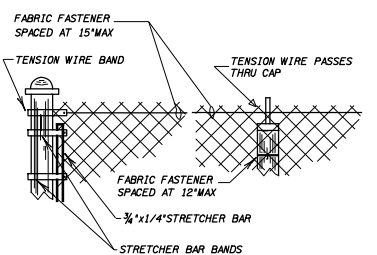
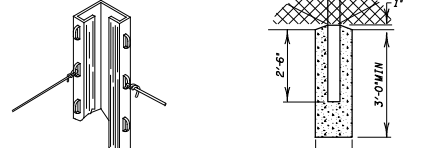
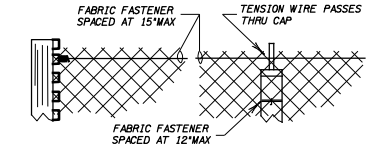
SIDEWALK PLACEMENT DETAIL AT DRIVE CROSSING



CORNER OR END CHANNEL POST

INTERMEDIATE OR CORNER CHANNEL POST

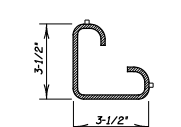
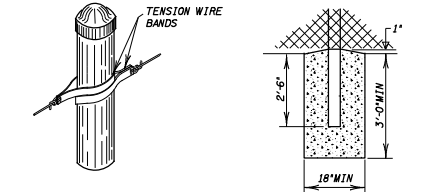
LINE POST



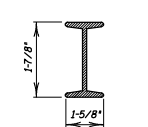
CORNER OR END ROUND POST

INTERMEDIATE OR CORNER ROUND POST

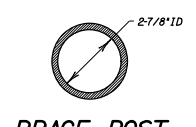
END POST



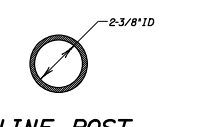
CHANNEL POST



TYPE 'H' LINE POST

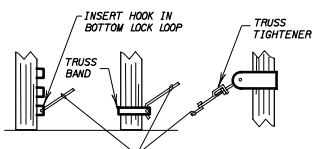


BRACE POST



LINE POST

- NOTES:
1. INTERMEDIATE BRACED POSTS SHALL BE PLACED AT 660 FT INTERVALS OR MIDWAY BETWEEN END AND CORNER POSTS WHEN THIS DISTANCE IS LESS THAN 1320 FT AND MORE THAN 660 FT.
 2. TENSION WIRE WILL BE STRETCHED TIGHT
 3. TOP & BOTTOM SELVAGES OF FENCE FABRIC SHALL HAVE A KNUCKLED FINISH.
 4. ALTERNATE MATERIALS MAY BE USED WITH THE APPROVAL OF THE CITY ENGINEER.
 5. FENCE FABRIC SHALL BE FASTENED TO TOP TENSION WIRE AND TO EACH POST.
 6. IF HOG RINGS ARE USED THEY SHALL BE 12 GAGE IF TIGHTLY CRIMPED ABOUT BOTH THE TENSION WIRE AND THE FABRIC WIRE, OR 11 GAGE IF UNCRIMPED.
 7. TENSION WIRE WILL BE 7 GAGE.
 8. RODS SHALL BE GROUNDED EVERY 500 FEET.



BRACE POST

GENERAL STANDARDS

SHEET 1 OF 1

CITY OF WIXOM
OAKLAND COUNTY, MICHIGAN

STANDARD CONSTRUCTION DETAIL SHEET

HUBBELL, ROTH & CLARK, INC.
Consulting Engineers

DATE	REVISION
05-14-2013	ADOPTED BY CITY COUNCIL

TIME: 21-Mar-2013 13:57

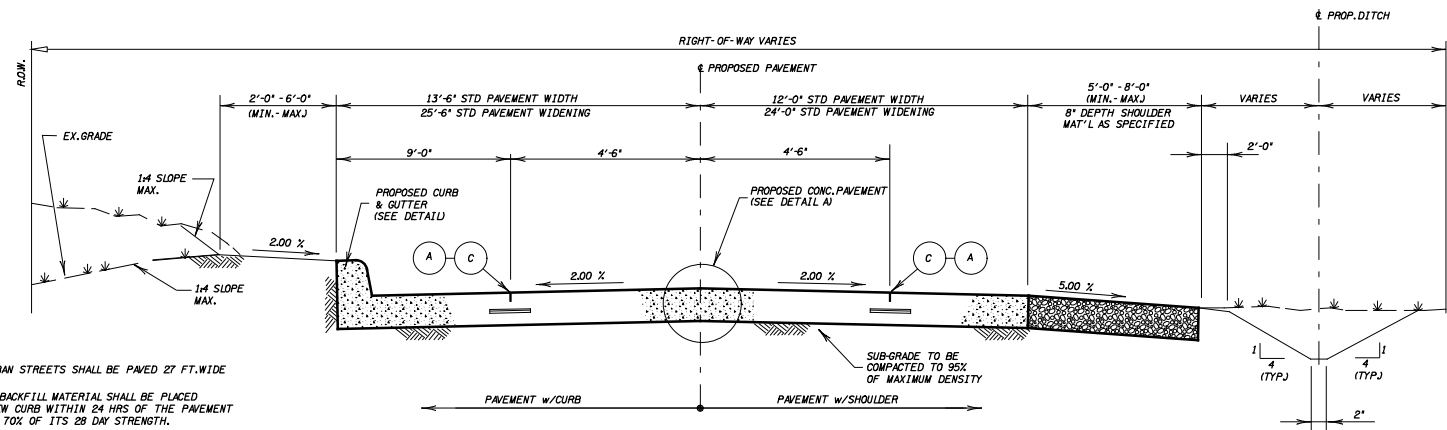
PEL TBL - I:\msh\p\paving\biocrest\c21b

CLP: TBL - I:\msh\p\paving\biocrest\c21b

QUEUE - \urban\struct\1117

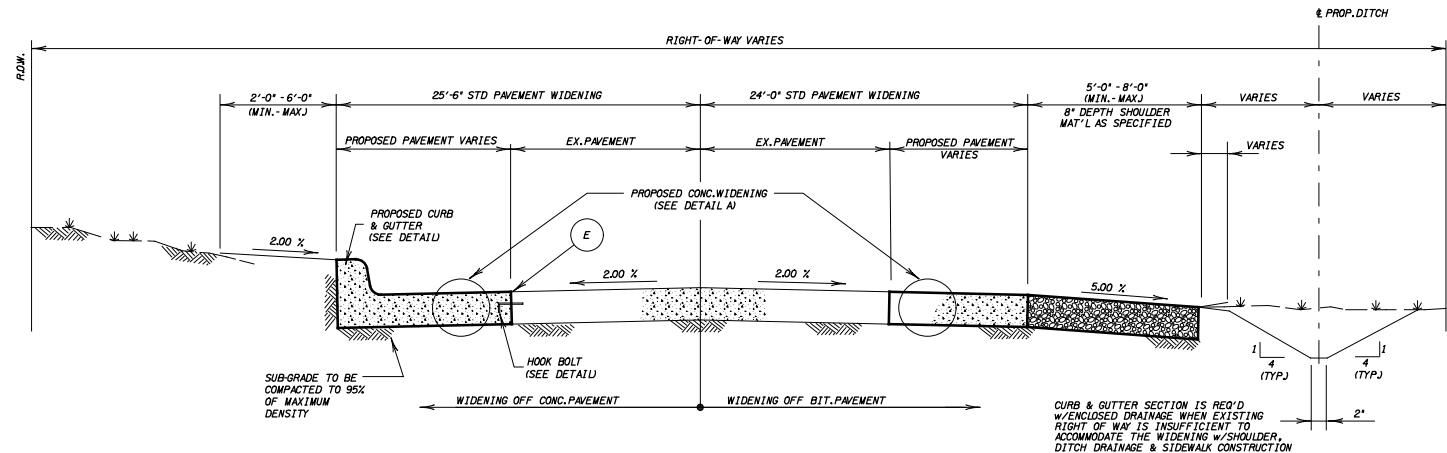
DESIGN FILE - \v201200201\2007\VC\plans\1_12-2012.dgn

USER NAME - d.james



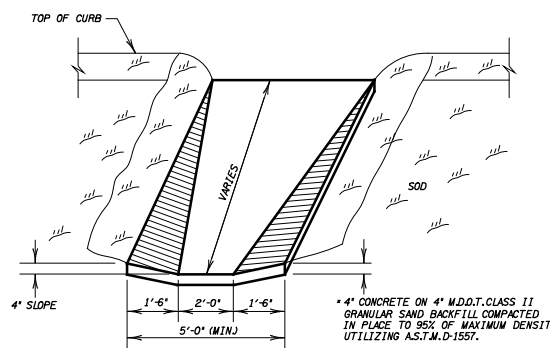
- NOTES:
1. ALL EX. URBAN STREETS SHALL BE PAVED 27 FT. WIDE
 2. APPROVED BACKFILL MATERIAL SHALL BE PLACED BEHIND NEW CURB WITHIN 24 HRS OF THE PAVEMENT ATTAINING 70% OF ITS 28 DAY STRENGTH.
 3. TRANSVERSE JOINTING SHALL MATCH THE EXISTING ADJACENT PAVEMENT.

CONCRETE PAVEMENT SECTION * 1

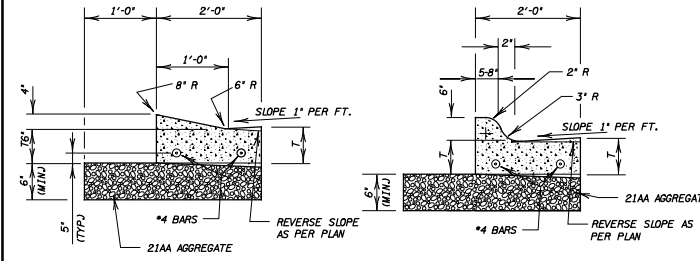


- NOTE:
1. WHEN WIDENING A CONCRETE PAVEMENT, THE EXISTING PAVEMENT SHALL BE REMOVED TO THE NEXT JOINT, WHEN THE DIMENSION FOR THE PAVEMENT TO REMAIN IS 6'-0" OR LESS.

CONCRETE PAVEMENT SECTION * 2



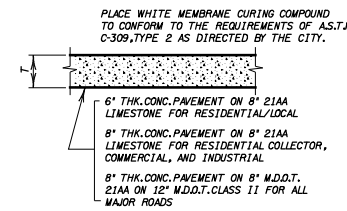
CONCRETE SPILLWAY



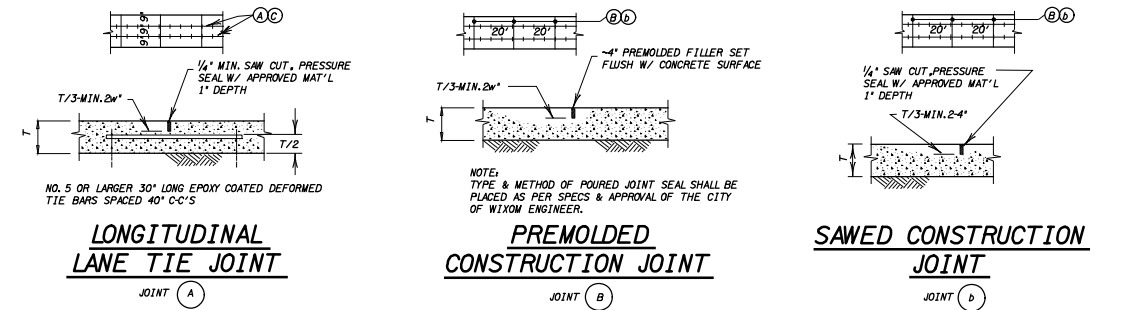
4" MOUNTABLE CURB & GUTTER

6" STRAIGHT FACED CURB & GUTTER

- NOTES:
1. WHITE MEMBRANE CURING COMPOUND SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. C-309, TYPE 2 AND PLACED AS DIRECTED BY THE CITY.
 2. T - THICKNESS OF CONCRETE PAVEMENT OR 9" WHEN USED WITH BITUMINOUS PAVEMENT, WHICHEVER IS GREATER.



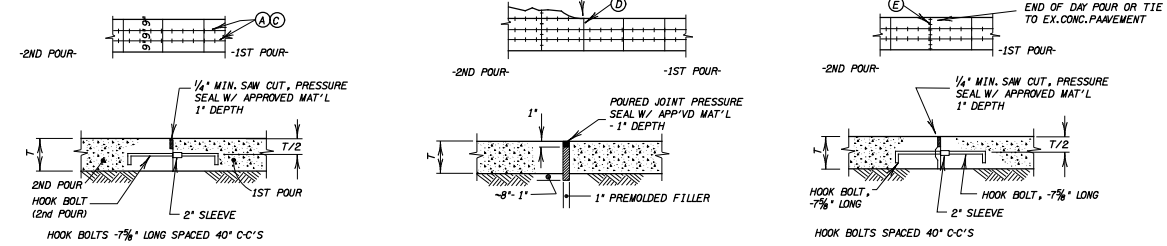
DETAIL A



LONGITUDINAL LANE TIE JOINT JOINT (A)

PREMOLDED CONSTRUCTION JOINT JOINT (B)

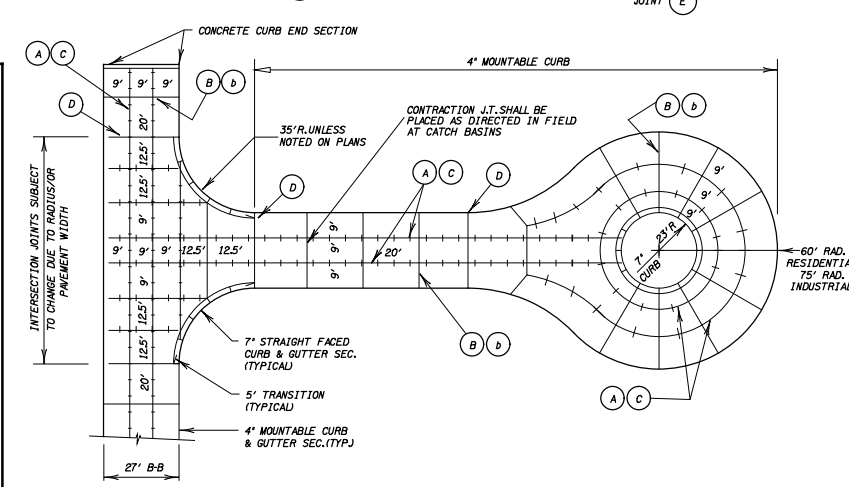
SAWED CONSTRUCTION JOINT JOINT (D)



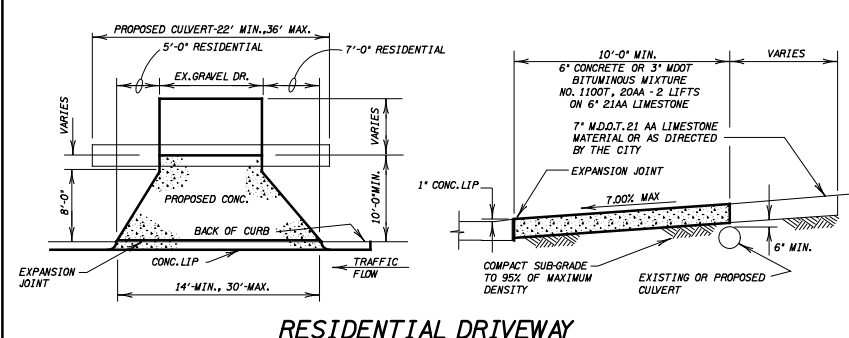
LONGITUDINAL BULKHEAD JOINT JOINT (C)

EXPANSION JOINT JOINT (E)

TRANSVERSE CONSTRUCTION JOINT JOINT (E)



CONCRETE PAVEMENT JOINTS - RESIDENTIAL



RESIDENTIAL DRIVEWAY

PAVEMENT STANDARDS

SHEET 1 OF 2

CITY OF WIXOM
OAKLAND COUNTY, MICHIGAN
STANDARD CONSTRUCTION DETAIL SHEET



DATE	REVISION
05-14-2013	ADOPTED BY CITY COUNCIL

