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**CITY OF BATTLE CREEK, MICHIGAN  
 NOTICE OF INVITATION FOR BIDS  
 Buckner Drive and Site Mass Grading Improvements  
 IFB #2019-001B**

**IFB DUE DATE and TIME:** August 7, 2018 at 2:00 pm local time (office hours 8-12 and 1-5) **NOTE!** City Hall now has Security on the 1<sup>st</sup> floor. Please allow extra time to get through Security when dropping off your bid.

**BID SUBMITTAL:** Bids must be submitted in a sealed envelope with the IFB number, the due date/time and the bidder's name and address clearly indicated on the envelope. Bids must be in the actual possession of the Purchasing Department Room 214, City Hall, 10 N. Division Street, Battle Creek, Michigan 49014 on or prior to the exact time and date indicated above. The prevailing clock shall be [www.time.gov](http://www.time.gov). Late bids will not be considered. All bids will be publicly opened and read aloud at the aforementioned address. All interested parties are invited to attend.

**PROJECT DESCRIPTION:** The City of Battle Creek will accept sealed bids for the Buckner Drive and Site Mass Grading Improvement project. This project consists of realigning approximately 900-feet towards the end of Buckner Drive to align with a future overpass to the west W.K. Kellogg Airport property. The roadway includes pavement removals, new curb and gutter, storm sewer and driveway realignments. This project also includes grading and moving approximately 200,000-cyd of earth material at four sites within close proximity of Buckner. Hauling to be included with earthwork items. Associated traffic control, soil erosion devices and permanent seeding is part of the project with a total estimate of \$2.5 million.

<p><b>PRE-BID CONFERENCE: NONE</b></p>	<p><b>FUNDING:</b> This project has NO federal or state funding. All project funding is provided by the City of Battle Creek. None of the CDBG requirements are applicable for this contract.</p>
<p><b>TECHNICAL QUESTIONS OR SITE VISITATION:</b>          Kurt Tribbett          269-966-3480</p>	<p><b>PREVAILING WAGES:</b> Required for this project. See attached wage rates at the end of this document. Contractor shall abide by all the requirements set forth in Section 208.09, PREVAILING WAGES ON CITY PROJECTS, of the City's Administrative Code.</p>
<p><b>COPIES OF IFB download only:</b>  <a href="http://www.battlecreekmi.gov/230/Bid-Proposal-Solicitations">http://www.battlecreekmi.gov/230/Bid-Proposal-Solicitations</a></p> <p><b>PLANHOLDERS LIST:</b>          Purchasing          10 N. Division Rm 214          Battle Creek, MI 49014          269-966-3390</p>	<p><b>FEE: NO FEE</b></p> <p><b>IFB ISSUE DATE: July 18, 2018</b></p>
<p><b>DOCUMENT EXAMINATION:</b>          City of Battle Creek, Purchasing Division          Dodge Corporation in Kalamazoo, Michigan          Builders Exchange in Grand Rapids, Kalamazoo &amp; Lansing, Michigan</p>	<p><b>ADDENDA:</b> Each addendum will be on file in the Office of the Purchasing Agent. To the extent possible, copies will be mailed to each person registered as having received a set of bid documents. It shall be the bidder's responsibility to make inquiry as to addenda issued. All such addenda shall become a binding part of the contract.</p>
<p><b>BID BOND:</b> Each bid must be accompanied by a certified check, cashier's check, or standard form bid bond, made payable to the City of Battle Creek, in an amount of not less than five (5%) percent of the base bid submitted. Failure of any accepted bidder to enter into a contract for the work will cause forfeit of the bid security. After contracts for the work have been signed, all bid securities will be returned.</p>	<p><b>PERFORMANCE/LABOR/MATERIALS BONDS:</b> The accepted bidder will be required to furnish a satisfactory performance bond and labor/materials payment bond, each in an amount equal to 100% of the contract and insurance certificate upon forms acceptable to the City.</p>
<p><b>BID VALID:</b> Bids may be withdrawn up to the time and date of the bid opening. After the bid opening, bids may not be withdrawn for a period of ninety (90) days thereafter. The City of Battle Creek reserves the right to waive any irregularity or informality in bids, to reject any and/or all bids, in whole or in part, or to award any contract to other than the low bidder, should it be deemed in its best interest to do so.</p>	

## SECTION I - SPECIAL INFORMATION FOR BIDDERS

### 1. General Contract Specification

The following sections of the General Contract Specifications BC-19-08, will be applicable for this contract General Instructions to Bidders and General Conditions of City Contracts.

### 2. Order Of Precedence

The plans and specifications shall be considered to be one complete document and what is called for in one shall be considered as being called for in all. In the event that there is a conflict between the parts, the following order of precedence shall govern:

Addenda to bidding documents  
The Contract Drawings  
The Contract Special Provisions  
The Contract Special Instructions  
The Contract Special Conditions  
The City of Battle Creek General Contract 19-08

### 3. Special Conditions

The purpose of Special Conditions, Special Instructions, and Project Specifications are to change, delete, clarify or add to General Conditions, General Instructions or General Specifications found in GENERAL CONTRACT SPECIFICATIONS BC 19-08, issued 1998. Only those items addressed in Special Conditions, Special Instructions, or Project Provisions are affected. All other conditions in General Conditions, General Instructions and General Specifications still apply. Special Conditions, Special Instructions, Project Specifications, supersedes General Conditions, General Instructions and General Specifications, and in all cases shall take precedence.

### 4. Registration Requirements for Contractors

All bidders, including General Contractors and Specialty Contractors, shall hold or obtain such Contractors or Business Licenses as required State and Local statues.

### 5. Currency

Prices calculated by the bidder shall be stated in U.S. dollars.

### 6. Unit Price

When the Bid for the work is to be submitted on a unit price basis, unit price Bids will be accepted on all items of work set forth in the Bid, except those designated to be paid for as a lump sum. The estimated of quantities of work to be done is tabulated in the Bid and although stated with as much accuracy as possible, are approximate only and is assumed solely for the basis of calculation upon which the award of Contract shall be made. Payment to the Contractor will be made on the measurement of the work actually performed by the Contractor as specified in the Contract Documents. Unit prices will prevail in event of discrepancy and in bid tabulations.

### 7. Liquidated Damages

Failure of the Contractor to complete the work within the time allowed will result in damages being sustained by the City. Such damages are, and will continue to be, impracticable and extremely difficult to determine. Unless otherwise provided in the Special Conditions, the Contractor will pay to the City for the liquidated damages and not as penalty one thousand five hundred fifty dollars (\$1550.00) for each calendar day of delay in finishing the work in excess of the time specified for completion, plus any Contractor will pay the City for the liquidated damages herein before mentioned are in lieu of the actual damages arising from such breaches of this contract; which said sums the City shall have the right to deduct from any monies in its hands, otherwise due, or to become due, to said Contractor or to sue for and recover compensation or damages for non performance of this Contract at the time stipulated herein and provided for. The attention of bidders is directed to the provisions and the General Conditions of contract requiring the Contractor to pay for all excess cost of field engineering and inspection as therein defined.

### 8. Listing of Subcontractors

Failure to list subcontractors and major suppliers, where feasible, may be cause for rejection of the Bidder's Bid as non-responsive.

### 9. Non-collusion:

By signing the Offer to Contract, the bidder, by its officers and authorized agents or representatives present at the time of filing this bid, being duly sworn on their oaths say, that neither they nor any of them have in any way, directly or indirectly entered into any arrangement or agreement with any other bidder or with any public officer of such City of Battle Creek, Michigan, whereby such affidavit or affiants or either of them has paid or is to pay to such other bidder or public officer any sum of money, or has given or is to give to such other bidder or public officer anything of value whatever, or such affidavit or affiants or either of them has not directly or indirectly, entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in the letting of the contract sought for by the attached bids, that no inducement of any form or character other than that which appears on the face of the bid will be suggested, offered, paid or delivered to any person whomsoever to influence the acceptance of the bid or awarding of the contract, nor has this bidder any agreement or

understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contract sought by this bid.

10. Contractor's Insurance

- a. The Contractor shall at the time of execution of this contract, file with the City the Certificate of Insurance, which shall cover all of his insurance as required herein, including evidence of payment of premiums thereon, and the policy or policies or insurance covering said City and their officers, agents and employees. Each such policy and certificate shall be satisfactory to the City. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from his operations under this Contract. The contractor shall maintain insurances in force at all times during the term of this agreement at the minimum amounts and types as indicated.

<u>Coverage Afforded</u>	<u>Limits of Liability</u>
Workers' Compensation:	\$ 100,000 or statutory limit
Commercial General Liability: Bodily Injury (including XCU if appropriate) Property Damage or Combined Single Limit	\$1,000,000 each occurrence \$1,000,000 each occurrence \$2,000,000
Automobile Liability: Bodily Injury	\$ 300,000 each person
Liability	\$ 500,000 each occurrence
Property Damage or Combined Single Limit	\$ 500,000 \$ 500,000

The City of Battle Creek shall be listed as an **additional insured on general liability coverage**, and shall be provided with a Certificate of Insurance that reflects this additional insured status. A 30-day notice of cancellation or material change shall be provided to the City and so noted on the Certificate of Insurance. All certificates and notices shall be sent to City of Battle Creek, 10 N. Division, Suite 214, Battle Creek, MI 49014.

- 11. Vendor Evaluation: Experience with the City shall be taken into consideration when evaluating responsibility of the vendor.

- 12. Permits: Contractor shall secure all necessary permits to complete the work as described in this IFB. These costs shall be included in the bid price.

13. Michigan Constitutional Requirement:

- a). Notwithstanding any provision in this Contract to the contrary, and in accordance with Article I, Section 26 of the Michigan Constitution as adopted by the electorate November 7, 2006, the City and its general contractors shall not discriminate against, or grant preferential treatment to, any individual or group on the basis of race, sex, color, ethnicity, or national origin in the operation of this Contract.
- b). This section shall not prohibit any action that must be taken to establish or maintain eligibility for any federal program if ineligibility would result in a loss of federal funds in connection with this Contract, nor shall this section be interpreted as prohibiting bona fide qualifications based on sex that are reasonable necessary to the execution of this Contract.
- c). In the event of conflict between any term of this Contract and this section, the language of this section shall control.
- d) "Any party bringing a legal action or proceeding against any other party arising out of or relating to this Agreement or the transactions it contemplates shall bring the legal action or proceeding: (i) in the United States District Court for the Western District of Michigan; or (ii) in any court of the State of Michigan sitting in Calhoun County, if there is no federal subject matter jurisdiction."

**SECTION II – OFFER TO CONTRACT**

DATE: \_\_\_\_\_

NAME OF BIDDER: \_\_\_\_\_

BUSINESS ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

To: The City of Battle Creek, Michigan

The undersigned, as Bidder, declares that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any person, firm or corporation; that he has carefully examined the location of the proposed work, the proposed forms of Agreement and Bonds, and the Contract Drawings and Specifications for the above designated work, all other documents referred to or mentioned in the Contract Documents, the Contract Drawings and Specifications, including Addenda issued thereto; and he proposes and agrees if this bid is accepted that he will contract with the City of Battle Creek, Michigan, in the form of the copy of the Agreement included in these Contract Documents, to provide all necessary machinery, tools, apparatus, and other means of construction, including utility and transportation services necessary to do all the work and furnish all materials and equipment specified or referred to in the Contract Documents, in the manner and time therein prescribed and according to the requirements of the City of Battle Creek, Michigan, as therein set forth and to furnish the Contractor's Bonds and Insurance, and to do all other things required of the Contractor by the Contract Documents, and that he will take in full payment therefore the sums set forth BELOW;

A bid must be made on each item with no qualifying statement(s). Bidder acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents. All specific cash allowances are included in the prices set forth below and have been computed in accordance with the Contract Documents.

Acknowledgement of addenda: \_\_\_\_\_; \_\_\_\_\_; \_\_\_\_\_; \_\_\_\_\_; \_\_\_\_\_; \_\_\_\_\_

PRICE PAGE

BUCKNER DRIVE AND SITE MASS GRADING IMPROVEMENTS

Item	DESCRIPTION	EST. QTY.	UNITS	UNIT PRICE	AMOUNT
<b>CATEGORY 1 -Road Work</b>					
1	Mobilization, Max	1	LSUM		
2	Clearing	0.23	Acre		
3	Tree, Rem, 19 inch to 36 inch	1	Ea		
4	Dr Structure, Rem	6	Ea		
5	Sewer, Rem, Less than 24 inch	411	Ft		
6	Curb and Gutter, Rem	1,161	Ft		
7	Exploratory Investigation, Vertical	20	Ft		
8	Relocate Light Pole	3	Ea		
9	Relocate Business Sign	1	Ea		
10	Embankment, CIP	6,151	Cyd		
11	Excavation, Earth	2,180	Cyd		
12	Subgrade Undercutting, Type II, Modified	200	Cyd		
13	Erosion Control, Inlet Protection, Fabric Drop	25	Ea		
14	Erosion Control, Silt Fence	3,425	Ft		
15	Aggregate Base, 6 inch	733	Syd		
16	Aggregate Base, 9 inch	5,910	Syd		
17	Maintenance Gravel	350	Ton		
18	Culv End Sect, 24 inch	1	Ea		

19	Sewer, CI E, 12 inch, Tr Det B	665	Ft		
20	Sewer, CI E, 15 inch, Tr Det B	440	Ft		
21	Sewer, CI E, 24 inch, Tr Det B	64	Ft		
22	Sewer Bulkhead, 12 inch	1	Ea		
23	Dr Structure Cover, Adj, Case 1	2	Ea		
24	Dr Structure Cover, Adj, Case 2	1	Ea		
25	Dr Structure Cover, Type B	4	Ea		
26	Dr Structure Cover, Type K	12	Ea		
27	Dr Structure, 24 inch dia	5	Ea		
28	Dr Structure, 48 inch dia	9	Ea		
29	Dr Structure, Add Depth of 48 inch dia, 8 foot to 15 foot	12	Ea		
30	Dr Structure, Tap, 12 inch	1	Ea		
31	Underdrain, Subgrade, 6 inch	1,801	Ft		
32	Underdrain Outlet, 6 inch	50	Ft		
33	HMA Surface, Rem	4,661	Syd		
34	HMA, 3E3	503	Ton		
35	HMA, 4E3	670	Ton		
36	HMA, 5E3	335	Ton		
37	HMA Approach	956	Ton		
38	HMA, Temp Pavt (4E3)	40	Ton		
39	HMA, Temp Pavt (5E3)	40	Ton		
40	Curb and Gutter, Conc, Det F4	1,983	Ft		
41	Driveway Opening, Conc, Det M	344	Ft		

42	Post, Mailbox	1	Ea		
43	Post, Steel, 3 lb	112	Ft		
44	Sign, Type III, Erect, Salv	2	Ea		
45	Sign, Type III, Rem	5	Ea		
46	Sign, Type IIIB	6	Ea		
47	Pavt Mrkg, Waterborne, for Rest Areas, Parks, & Lots, 4 inch, Yellow	187	Ft		
48	Barricade, Type III, High Intensity, Lighted, Furn	20	Ea		
49	Barricade, Type III, High Intensity, Lighted, Oper	20	Ea		
50	Channelizing Device, 42 inch, Furn	90	Ea		
51	Channelizing Device, 42 inch, Oper	90	Ea		
52	Lighted Arrow, Type C, Furn	2	Ea		
53	Lighted Arrow, Type C, Oper	2	Ea		
54	Minor Traf Devices	1	LSUM		
55	Pavt Mrkg, Wet Reflective, Type NR, Paint, 4 inch, White, Temp	150	Ft		
56	Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp	850	Ft		
57	Pavt Mrkg, Wet Reflective, Type R, Tape, 24 inch, Stop Bar	44	Ft		
58	PTS System, Temp, Furn	1	Ea		
59	PTS System, Temp, Oper	1	Ea		
60	Sign Cover	5	Ea		
61	Sign, Type B, Temp, Prismatic, Furn	297	Sft		

62	Sign, Type B, Temp, Prismatic, Oper	297	Sft		
63	Sign, Type B, Temp, Prismatic, Special, Furn	12	Sft		
64	Sign, Type B, Temp, Prismatic, Special, Oper	12	Sft		
65	Traf Regulator Control	1	LSUM		
66	Driveway Assistance Device, Portable, Temporary	1	Ea		
67	Riprap, Plain	12	Syd		
68	Boulder, Relocate	120	Ea		
69	Modular Block Wall	1,329	Sft		
70	Turf Establishment, Performance	5,563	Syd		
71	Protect Corners	5	Ea		
72	Hydrant, Relocate, Case 2	1	Ea		
73	Water Main Conflict, 12 inch	3	Ea		

**SUBTOTAL FOR CATEGORY 1 - Road work (Items 1-73)**

\$ \_\_\_\_\_

<b>CATEGORY 2 -Systex Site Work</b>					
74	Excavation, Site	11,372	Cyd		
75	Embankment, Site	472	Cyd		
76	Erosion Control, Gravel Access Approach	1	Ea		
77	Erosion Control, Silt Fence	2,524	Ft		
78	Erosion Control, Straw Wattle Check Dam	40	Ea		
79	Post, Steel, 3 lb	14	Ft		
80	Sign, Type III, Rem	1	Ea		

81	Sign, Type IIIB	3	Sft		
82	Riprap, Plain	24	Syd		
83	Mulch Blanket	14,090	Syd		
84	Site Restoration	8	Acre		
85	Stripping and Stockpiling Topsoil	12,952	Cyd		

**SUBTOTAL FOR CATEGORY 2 Systex Site Work (Items 74-85) \$ \_\_\_\_\_**

<b>CATEGORY 3 -Nexthermal Site Work</b>					
86	Excavation, Site	2,358	Cyd		
87	Embankment, Site	9,118	Cyd		
88	Erosion Control, Gravel Access Approach	1	Ea		
89	Erosion Control, Silt Fence	619	Ft		
90	Erosion Control, Straw Wattle Check Dam	32	Ea		
91	Riprap, Plain	61	Syd		
92	Mulch Blanket	6,349	Syd		
93	Site Restoration	5	Acre		
94	Stripping and Stockpiling Topsoil	5,358	Cyd		

**SUBTOTAL FOR CATEGORY 3 – Nexthermal Site Work (Items 86-94) \$ \_\_\_\_\_**

<b>CATEGORY 4 -Columbia Site Work</b>					
95	Excavation, Site	96,500	Cyd		
96	Erosion Control, Gravel Access Approach	1	Ea		
97	Erosion Control, Silt Fence	3,600	Ft		

98	Mulch Blanket	5,000	Syd		
99	Site Restoration	15	Acre		
100	Stripping and Stockpiling Topsoil	12,800	Cyd		

**SUBTOTAL FOR CATEGORY 4 –Columbia Site Work (Items 95-100)**                      \$ \_\_\_\_\_

CATEGORY 5 -Airport Site Work					
101	Safety & Security	1	LSUM		
102	Unclassified Excavation	4,111	Cyd		
103	Borrow Placement	170,242	Cyd		
104	Installation and Removal of Silt Fence	5,950	Ft		
105	Recycled Concrete Aggregate Base Course	818	Cyd		
106	6-Inch Perforated Polyethylene Underdrain Pipe, Schedule 40, Complete	1,140	Ft		
107	Asphalt Pavement Removal	640	Syd		
108	Topsoil Stripping and Restoration	27	Acre		

**SUBTOTAL FOR CATEGORY 5 – Airport Site Work (Items 101-108)**                      \$ \_\_\_\_\_

**Total Bid Amount (Items 1-108)**                      \$ \_\_\_\_\_

**BID CONDITIONS**

It is expressly understood and agreed that the total base bid as reflected on the attached Bidding Schedule is the basis for establishing the amount of the bid security on this bid and that this total base bid is not to be construed a Lump Sum Bid. It is further understood that quantities in the Bidding Schedule for unit price items are approximate only, and that payment of a contract will be made only on the actual quantities or work completed in place, measured on the basis defined in the General Provisions, Contract Specifications or other Contract Documents.

The undersigned has carefully checked the attached Bidding Schedule against the Contract Drawings and Specifications and other Contract Documents before preparing this Bid and accepts the said quantities to be substantially correct, both as to classification and amount, and as correctly listing the complete work to be done in accordance with the Contract Drawings, Specifications and other Contract Documents.

**BID SECURITY**

Accompanying this bid is a \_\_\_\_\_ in the amount of five percent (5%) or \_\_\_\_\_ Dollars (\$\_\_\_\_\_). The total amount of bid security is based on the total base bid of this Bid.

**COMPLETION**

If awarded a contract under this Bid, the undersigned agrees to start work at the site August 27, 2018. The undersigned further agrees to complete the project by April 30, 2019.

**LIQUIDATED DAMAGES**

Liquidated damages of \$1550.00 per calendar day will be assessed for failure to meet any deadline, as noted in the Project Specifications.

**BIDDER'S SIGNATURE:** Complete the applicable paragraph below.

I certify, under penalty of perjury, that I have the legal authorization to bind the firm hereunder, and that our firm is not debarred from doing business under the Federal Excluded Parties List System (epls.gov).

I, the Contractor or Contractor's legally authorized signer, further certify compliance with the City of Battle Creek Ordinance Chapter 214, Discrimination Prohibited. I further acknowledge and agree that the Contractor's violation of Chapter 214 shall be a material breach of this contract. In addition, Contractor acknowledges and agrees that it shall be liable for any costs or expenses incurred by the City in obtaining from other sources, the work and services to be rendered or performed or the goods or properties to be furnished or delivered to the City under the contract as a result of a material breach in the Contract for violations of Chapter 214.

**(a) Corporation**

The bidder is a corporation organized and existing under the State of \_\_\_\_\_, which operates under the legal name of \_\_\_\_\_, and the full names of its officers are as follows:

President: \_\_\_\_\_  
Secretary: \_\_\_\_\_  
Treasurer: \_\_\_\_\_  
Manager: \_\_\_\_\_

**(b) Co-Partnership**

The bidder is a co-partnership consisting of individual partners whose full names are as follows:

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

**(c) Individual**

The bidder is an individual whose full name is \_\_\_\_\_ and, if operating under a trade name, said trade name is \_\_\_\_\_.

NAME: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_  
CITY & STATE: \_\_\_\_\_

**THIS BID OFFERED BY:**

SIGNATURE: \_\_\_\_\_  
NAME: \_\_\_\_\_  
TITLE: \_\_\_\_\_  
PHONE: \_\_\_\_\_  
FAX: \_\_\_\_\_  
EMAIL: \_\_\_\_\_

(SEAL)

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public  
County of \_\_\_\_\_  
Commission Expires: \_\_\_\_\_

**SECTION III - CONTRACTOR'S BID FORMS**

THESE FORMS MUST BE RETURNED WITH THE BID

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CONTRACTOR'S BID BOND

CORPORATION CERTIFICATE

SUBCONTRACTOR AND DBE FORM

STATEMENT OF EXPERIENCE OF BIDDERS

### CONTRACTOR'S BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we, \_\_\_\_\_, (hereinafter called the "Principal"), and \_\_\_\_\_ (hereinafter called the "Principal"), and \_\_\_\_\_ hereinafter called the "Surety"), a corporation chartered and existing under the laws of the State of \_\_\_\_\_, with its principal offices in the City of \_\_\_\_\_ and authorized to do business in the State of Michigan, are held and firmly bound unto the City of Battle Creek (hereinafter called the "Owner"), in the full and just sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) good and lawful money of the United States of America, to be paid upon demand of the Owner, to which payment well and truly to be made, the Principal and Surety bind themselves, their heirs, executors, administrators, and assigns, jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted to the Owner, a Bid for furnishing all labor, materials, equipment and incidentals necessary to complete this contract.

WHEREAS, the Principal desires to file this bond in accordance with law, in lieu of a certified bidder's check otherwise required to accompany this Bid.

NOW, THEREFORE: The conditions of this obligation are such that if the Bid be accepted, the Principal shall, within ten (10) days after the date of receipt of a written notice of award of contract, execute a contract in accordance with the Bid and upon the terms, conditions and price(s) set forth therein, of the form and manner required by the Owner, and execute a sufficient and satisfactory contract performance bond payable to the Owner, and in an amount of One Hundred Percent (100%) of the total contract price in the form and with security satisfactory to said Owner, then this obligation to be void; otherwise to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty but as liquidated damages.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Principal

By: \_\_\_\_\_  
(Seal)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_  
(Seal)

Countersigned: \_\_\_\_\_

**CERTIFICATE TO BE EXECUTED**

**IF**

**CONTRACTOR IS A CORPORATION**

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_ of the Corporation named as Contractor hereinabove; that \_\_\_\_\_ who signed the foregoing Agreement on behalf of the Contractor was then the \_\_\_\_\_ of said Corporation; that said Agreement was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

\_\_\_\_\_

(Corporate Seal)

**SUBCONTRACTOR AND DBE FORM – submit with bid**

**I. YOUR FIRM'S BACKGROUND:**

- Is your firm an MBE (at least 51% minority ownership)?     YES     NO
- Is your firm a WBE (at least 51% woman ownership)?     YES     NO
- Are you subcontracting any part of this project?     YES     NO

**II. SUBCONTRACTING INFORMATION:** If subcontracting any part of the project, the bidder/contractor expressly agrees that:

- (1) If awarded a contract as a result of this bid, the major subcontractors used in the prosecution of the work will be those listed below, and
- (2) The following list includes all subcontractors who will perform work representing approximately five percent (5%) or more of the Total Base Bid.
- (3) The Bidder represents that the subcontractors listed below are financially responsible and are qualified to do the work required.

SUBCONTRACTOR NAME	City/State	Trade or Commodity	MBE	WBE	Approximate dollar value
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____
_____	_____	_____	Y/N	Y/N	\$ _____

**III. DBE RECRUITMENT ACTIVITY LOG:** List the MBE's and WBE's that were approached about being a subcontractor for this job, but who are NOT listed above as a subcontractor.

NAME OF FIRM APPROACHED, BUT NOT USED ON THIS PROJECT	City/State	Trade or Commodity	MBE	WBE	Reason not used on this project
_____	_____	_____	Y/N	Y/N	_____
_____	_____	_____	Y/N	Y/N	_____
_____	_____	_____	Y/N	Y/N	_____
_____	_____	_____	Y/N	Y/N	_____

**STATEMENT OF EXPERIENCE OF BIDDER**

The Bidder shall state below the work of similar magnitude or character that he has done, and shall give references that will enable the City of Battle Creek to judge his experience, skill and business standing and of his ability to conduct the work as completely and as rapidly as required under the terms of this contract.

**PROJECT AND LOCATION**

**REFERENCES (include name and phone number)**

(1)	_____
	_____
(2)	_____
	_____
(3)	_____
	_____
(4)	_____
	_____
(5)	_____
	_____
(6)	_____
	_____
(7)	_____
	_____
(8)	_____
	_____
(9)	_____
	_____

**SECTION IV - CONTRACTOR'S CONTRACT FORMS**

THESE FORMS WILL BE REQUIRED FOR AWARD

CONTRACT FORM

PERFORMANCE BOND

LABOR AND MATERIAL BOND

**CONTRACT FORM**  
**CONTRACT NO. 2019-001B**  
**BUCKNER DRIVE AND SITE MASS GRADING IMPROVEMENTS**

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2018, by and between \_\_\_\_\_ hereinafter called the "Contractor" and the City of Battle Creek, hereinafter called the "Owner."

WITNESSETH: In consideration for the mutual covenants hereinafter stated, the parties agree for themselves, their personal representatives, successors, assigns as follows:

**I. The Contractor promises and agrees:**

A. To furnish all materials, construction water, equipment, tools, dewatering devices, skill and labor of every description necessary or reasonable incidental to carrying forth and completing in good, firm, substantial and workmanlike manner, the work specified, in strict conformity with the true intent of the NOTICE TO BIDDERS, SPECIAL INSTRUCTIONS, GENERAL INSTRUCTIONS, BID, SPECIAL CONDITIONS, GENERAL CONDITIONS, AGREEMENT, BONDS, GENERAL SPECIFICATIONS, and Project Specifications, and other contract documents and addenda thereto, which are hereby made a part hereof as fully and to the same effect as though they had been set forth at length herein.

B. To commence work under this contract on or before a date to be specified by the owner in a written Notice to Proceed and complete the project by the date specified in Bid.

C. Requirements for a specific trade or contract will generally be described in that portion of the specifications or drawings related to that trade or contract. Such requirements may, however, be described in other sections of the Contract Documents. The Contractor will be held responsible for having carefully examined all drawings and read all requirements of the specifications and all Contract Documents to avoid omissions or duplications and to insure a complete job.

D. The Contractor must be fully informed about conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract.

E. Any claim by the Contractor of an inability to meet any requirement set forth in the Contract Documents, or that any requirement of these documents is impractical or unreasonable, will not be recognized, unless the claim was made at the time his Bid was submitted, and specific provision is made for such claim in the Agreement between Owner and Contractor (Bid and Agreement).

F. Warranty: Contractor shall remove and replace at no additional cost to the City any defects in workmanship or materials that may be apparent or may develop within a period of one (1) year from the date of final acceptance.

G. NON-DISCRIMINATION CLAUSE: The bidder agrees not to discriminate against any employee or applicant for employment, to be employed in the performance of such contract with respect to hire tenure, terms, conditions or privileges, of employment, or any matter directly or indirectly related to employment because of his or her actual or perceived race, color, religion, national origin, sex, age, height, weight, marital status, physical or mental disability, family status, sexual orientation, or gender identity. Breach of this covenant may be regarded as a material breach of the contract as provided for in Act 220 and Act 453 of the Public Acts of 1976, as amended, entitled "Michigan Handicapper's Civil Rights Act" and/or the "Michigan Elliott Larson Civil Rights Act" and/or City of Battle Creek Chapter 214 "Discrimination Prohibited" Ordinance. The bidder further agrees to require similar provisions from any subcontractors, or suppliers. The bidder agrees to comply with the Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, as supplemented in Department of Labor regulations (41 CFR, Chapter 60).

**II. The Owner promises and agrees:**

A. To pay the Contractor for said work when completed in accordance with the provisions of these contract documents, and for the contract sum of:

dollars (\$ \_\_\_\_\_).

Payment for work is subject to additions provided therein and for the authorized work complete in place and accepted by the Owner or its authorized representatives.

III. It is further understood and agreed between the parties hereto as follows:

A. The said work is to be done in accordance with the laws of the State of Michigan to the entire satisfaction and approval of the Owner or its duly authorized representatives.

B. The decision of said Owner's authorized representative upon any questions connected with the execution of this Agreement or any failure or delay in the prosecution of the work by said Contractor shall be final and conclusive.

C. If, at any time after the execution of the Agreement and the Bond for its faithful performance, the Owner shall deem the surety or sureties then upon said bond to be unsatisfactory or, if, for any reason said bond shall cease to be adequate security for the performance of the work, the Contractor shall, at his expense, within fifteen (15) calendar days after receipt of written notice from the Owner to do so, furnish an additional bond or bonds in such form and amount and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Agreement until such new or additional security for the faithful performance of the work shall be furnished in a manner and form satisfactory to the Owner.

D. VENUE: Any party bringing a legal action or proceeding against any other party arising out of or relating to this Agreement or the transactions it contemplates shall bring the legal action or proceeding:

- (i) in the United States District Court for the Western District of Michigan; or
- (ii) in any court of the State of Michigan sitting in Calhoun County, if there is no federal subject matter jurisdiction.

E. GOVERNING LAW: This agreement shall be enforced under the laws of the State of Michigan. Contractor must comply with all applicable federal, state, county, and City laws, ordinances, and regulations. Contractor shall ensure payment of all taxes, licenses, permits, and other expenses of any nature associated with the provision of services herein. Contractor shall maintain in current status all Federal, State and Local licenses and permits required for the operation of the business conducted by the Contractor.

IN WITNESS WHEREOF, the said parties have hereunto set their hands and affixed their seals, the day and year first above written.

STATE OF MICHIGAN)  
                  ) ss  
COUNTY OF CALHOUN)

In the Presence of:

\_\_\_\_\_

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

CONTRACT FORM APPROVED BY:

\_\_\_\_\_  
City Attorney

SIGNED, SEALED, AND  
EXECUTED BY CONTRACTOR:

**I certify, under penalty of perjury, that I have the legal authorization to bind the firm hereunder, and that our firm is not debarred from doing business under the Federal Excluded Parties List System (epls.gov):**

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

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

SIGNED, SEALED, & EXECUTED  
BY CITY OF BATTLE CREEK

\_\_\_\_\_  
City Manager

**PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_, as Principal, and \_\_\_\_\_, as Surety, are held and firmly bound unto the City of Battle Creek in the full and just sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) lawful money of the United States of America for the payment of which sum of money well and truly to be made, we bind ourselves, heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ for the \_\_\_\_\_ complete, as described in the foregoing Bid and Agreement.

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if the said Principal shall in all respects well and truly keep and perform the said contract, and shall pay all sums of money due or to become due, for any labor, materials, apparatus, fixtures or equipment furnished for the purpose of constructing the work provided in said contract, and shall defend, indemnify and save harmless said City of Battle Creek against any liens, encumbrances, damages, claims, demands, expenses, costs and charges of every kind except as otherwise provided in said specifications and other Contract Documents arising out of or in relation to the performance of said work and the provisions of said contract, and shall remove and replace any defects in workmanship or materials which may be apparent or may develop within a period of one (1) year from the date of final acceptance, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

And the said Surety, for value received, hereby stipulates and agreed that no change, extension of time, alteration or addition to the terms of the contract or to work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement or to the work or to the specifications.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**PRINCIPAL ATTEST:**

\_\_\_\_\_  
Principal Business Name

\_\_\_\_\_  
Principal Secretary Signature & Seal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Principal Secretary Printed Name

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Witness of Principal

**SURETY ATTEST:**

\_\_\_\_\_  
Surety Business Name

BY: \_\_\_\_\_  
Attorney-in-Fact Signature & Seal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Attorney-in-Fact Printed Name

\_\_\_\_\_  
City, State, Zip

**LABOR AND MATERIALS BOND**

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned, \_\_\_\_\_, hereinafter called the "Principal," and \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_, having its principal office at \_\_\_\_\_, hereinafter called the "Surety," are held and firmly bound unto the City of Battle Creek, hereinafter called the "Owner," for use of any and every person, co-partnership, association or corporation interested in the full and just sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful money of the United States of America, to be paid to the said obligees or its or their assigns, to which payment 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 respective seals and dated this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

WHEREAS, the above bounded \_\_\_\_\_, Principal, has entered into a contract with the City of Battle Creek.

Dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, for the \_\_\_\_\_.

NOW, THEREFORE, THE CONDITION OF THIS CONDITION IS SUCH, that if the above bounded Principal shall and will promptly pay or cause to be paid all sums of money which may be due any person, co-partnership, association or corporation for all material furnished and labor supplied or performed in the prosecution of the work, whether or not the said material or labor enter into and become component parts of the work or improvement contemplated, then this obligation to be void; otherwise to remain in full force and effect.

The Principal and Surety further jointly and severally agree with the obligee herein that every person, co-partnership, association or corporation who, whether as subcontractor or otherwise, has furnished material or supplied or performed labor in the prosecution of the work as above provided and who has not been paid therefore may sue in assumption on this bond in the name of the Owner for his, their, or its use, prosecute the same to final judgment for such sum or sums as may be justly due him, them, or it, and have execution thereon, provided, however, that the Owner shall not be liable for payment of any costs or expenses of any such suit.

IT IS FURTHER AGREED, that any alterations which may be made in the terms of the contract or in the work to be done or materials to be furnished or labor to be supplied or performed under it or the giving by the Owner or any extension of time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and Surety or Sureties or either or any of them their heirs, executors, administrators, successors or assigns, from their liability hereunder, notice to the Surety or Sureties of any such alteration, extension or forbearance being hereby waived.

IN WITNESS WHEREOF, the said Principal and Surety have duly executed this bond under the seal and day and year first above written.

ATTEST:

\_\_\_\_\_  
(Seal)

\_\_\_\_\_  
Principal

BY: \_\_\_\_\_

\_\_\_\_\_  
Surety

ATTEST

\_\_\_\_\_

BY: \_\_\_\_\_  
Attorney-in-Fact

(SEAL)

## SECTION V - SPECIAL CONDITIONS

1. Supplementary Definitions: The following additional definitions supplement the definitions included in the General Contract Specifications BC 19-08, Paragraph I-1 of the General Conditions of Contract:

(a) "Owner" or "City of Battle Creek" or "City" shall mean the City of Battle Creek, MI, acting through the City Commission or any other board official, or officials to which or whom the power belonging to the Commission shall, by virtue of any act or acts thereafter passed are held to appertain.

(b) "Engineer" shall mean the City Engineer, or other persons designated by the City acting directly or through authorized agents.

(c) "Contract Drawings" The drawings applicable to the work to be performed under this contract and that are referred to in this documents as the plans or as the contract drawings.

**SECTION VII – PREVAILING WAGES**

General Decision Number: MI180001 07/13/2018 MI1

5 07/13/2018

Superseded General Decision Number: MI20170001

CARP0004-004 06/01/2016

State: Michigan

REMAINDER OF STATE

Construction Types: Highway (Highway, Airport & Bridge xxxxx and Sewer/Incid. to Hwy.)

Rates Fringes

CARPENTER ( Piledriver).....\$ 26.33 19.18

-----  
 CARP0004-005 06/01/2016

Counties: Michigan Statewide.

LIVINGSTON (Townships of Brighton, Deerfield, Genoa, Hartland, Oceola & Tyrone), MACOMB, MONROE, OAKLAND, SANILAC, ST. CLAIR AND WAYNE COUNTIES

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Rates Fringes

CARPENTER (Piledriver).....\$ 29.47 25.94

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 ELEC0017-005 06/04/2018

STATEWIDE

Rates Fringes

Line Construction  
 Groundman/Driver.....\$ 28.33 6.45+29%  
 Journeyman Signal Tech,  
 Communications Tech, Tower  
 Tech & Fiber Optic Splicers.\$ 39.31  
 6.45+29%  
 Journeyman Specialist.....\$ 45.21 6.45+29%  
 Operator A.....\$ 33.22 6.45+29%  
 Operator B.....\$ 31.02 6.45+29%

Classifications

Journeyman Specialist: Refers to a crew of only one person working alone.  
 Operator A: Shall be proficient in operating all power equipment including: Backhoe, Excavator, Directional Bore and Boom/Digger truck.  
 Operator B: Shall be proficient in operating any 2 of the above mentioned pieces of equipment listed under Operator A.

Modification Number Publication Date

0 01/05/2018  
 1 02/09/2018  
 2 02/23/2018  
 3 03/16/2018  
 4 06/22/2018

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 ENGI0324-003 06/01/2017

ALCONA, ALPENA, ARENAC, BAY, CHEBOYGAN,  
 CLARE, CLINTON,  
 CRAWFORD, GENESEE, GLADWIN, GRATIOT,  
 HURON, INGHAM, IOSCO,  
 ISABELLA, JACKSON, LAPEER, LENAWEЕ,  
 LIVINGSTON, MACOMB,  
 MIDLAND, MONROE, MONTMORENCY, OAKLAND,  
 OGEMAW, OSCODA, OTSEGO,  
 PRESQUE ISLE, ROSCOMMON, SAGINAW, ST.  
 CLAIR, SANILAC,  
 SHIAWASSEE, TUSCOLA, WASHTENAW AND  
 WAYNE COUNTIES:

GROUP 4: Engineer when operating combination of  
 boom and jib  
 300' or longer on a crane that requires an oiler

GROUP 5: Engineer when operating combination of  
 boom and jib  
 220' or longer

GROUP 6: Engineer when operating combination of  
 boom and jib  
 220' or longer on a crane that requires an oiler

GROUP 7: Engineer when operating combination of  
 boom and jib  
 140' or longer

GROUP 8: Engineer when operating combination of  
 boom and jib  
 140' or longer on a crane that requires an oiler

GROUP 9: Tower crane & derrick operator (where  
 operator's  
 work station is 50 ft. or more above first sub-level)

GROUP 10: Tower crane & derrick operator (where  
 operator's  
 work station is 50 ft. or more above first sub-level) on  
 a  
 crane that requires an oiler

GROUP 11: Engineer when operating combination of  
 boom and jib  
 120' or longer

GROUP 12: Engineer when operating combination of  
 boom and jib  
 120' or longer on a crane that requires an oiler

GROUP 13: Crane operator; job mechanic and 3  
 drum hoist and  
 excavator

GROUP 14: Crane operator on a crane that requires  
 an oiler

GROUP 15: Hoisting operator; 2 drum hoist and  
 rubber tired  
 backhoe

GROUP 16: Forklift and 1 drum hoist

GROUP 17: Compressor or welder operator

GROUP 18: Oiler

Rates Fringes

OPERATOR: Power Equipment  
 (Steel Erection)

GROUP 1.....	\$ 44.32	23.00
GROUP 2.....	\$ 45.32	23.00
GROUP 3.....	\$ 42.82	23.00
GROUP 4.....	\$ 43.82	23.00
GROUP 5.....	\$ 41.32	23.00
GROUP 6.....	\$ 42.32	23.00
GROUP 7.....	\$ 41.05	23.00
GROUP 8.....	\$ 42.05	23.00
GROUP 9.....	\$ 40.60	23.00
GROUP 10.....	\$ 41.60	23.00
GROUP 11.....	\$ 39.87	23.00
GROUP 12.....	\$ 40.87	23.00
GROUP 13.....	\$ 39.51	23.00
GROUP 14.....	\$ 40.51	23.00
GROUP 15.....	\$ 38.87	23.00
GROUP 16.....	\$ 37.17	23.00
GROUP 17.....	\$ 32.06	23.00
GROUP 18.....	\$ 30.65	23.00

FOOTNOTE:

Paid Holidays: New Year's Day, Memorial Day,  
 Fourth of July,  
 Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR  
 CLASSIFICATIONS

GROUP 1: Engineer when operating combination of  
 boom and jib  
 400' or longer

GROUP 2: Engineer when operating combination of  
 boom and jib  
 400' or longer on a crane that requires an oiler

GROUP 3: Engineer when operating combination of  
 boom and jib  
 300' or longer

-----  
 ENGI0324-004 06/01/2017

AREA 1: ALLEGAN, BARRY, BERRIEN, BRANCH,  
 CALHOUN, CASS, EATON,  
 HILLSDALE, IONIA, KALAMAZOO, KENT, LAKE,  
 MANISTEE, MASON,  
 MECOSTA, MONTCALM, MUSKEGON, NEWAYGO,  
 OCEANA, OSCEOLA, OTTAWA,  
 ST. JOSEPH, VAN BUREN

AREA 2: ANTRIM, BENZIE, CHARLEVOIX, EMMET,  
 GRAND TRAVERSE,  
 KALKASKA, LEELANAU, MISSAUKEE AND  
 WEXFORD COUNTIES:

Hoist, Straddle Wagon, Mechanic, Grader and Hydro  
 Excavator.

GROUP 4: Air Tugger (single drum), Material Hoist  
 Pump 6" or  
 over, Elevators, Brokk Concrete Breaker.

GROUP 5: Air Compressor, Welder, Generators,  
 Conveyors

GROUP 6: Oiler and fire tender

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 ENGI0324-005 09/01/2017

AREA 1: GENESEE, LAPEER, LIVINGSTON,  
 MACOMB, MONROE, OAKLAND,  
 ST. CLAIR, WASHTENAW AND WAYNE COUNTIES

AREA 2: ALCONA, ALLEGAN, ALGER, ALPENA,  
 ANTRIM, ARENAC, BARAGA,  
 BARRY, BAY, BENZIE, BERRIEN, BRANCH,  
 CALHOUN, CASS,  
 CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE,  
 CLINTON, CRAWFORD,  
 DELTA, DICKINSON, EATON, EMMET, GLADWIN,  
 GOGEBIC, GRAND  
 TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON,  
 HURON, INGHAM, IONIA,  
 IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT,  
 KWEENAW, LAKE, LEELANAU, LENAWEE, LUCE,  
 MACKINAC, MANISTEE,  
 MARQUETTE, MASON, MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MUSKEGON,  
 NEWAYGO, OCEANA, OGEMAW,  
 ONTONAGON, OSCEOLA, OSCODA, OTSEGO,  
 OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SAGINAW, SANILAC,  
 SCHOOLCRAFT, SHIAWASSEE, ST.  
 JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD  
 COUNTIES

Rates Fringes

OPERATOR: Power Equipment  
 (Steel Erection)

	Rates	Fringes
AREA 1		
GROUP 1.....	\$ 44.32	23.00
GROUP 2.....	\$ 41.05	23.00
GROUP 3.....	\$ 39.51	23.00
GROUP 4.....	\$ 37.17	23.00
GROUP 5.....	\$ 32.06	23.00
GROUP 6.....	\$ 30.65	23.00
AREA 2		
GROUP 1.....	\$ 44.32	23.00
GROUP 2.....	\$ 41.05	23.00
GROUP 3.....	\$ 39.51	23.00
GROUP 4.....	\$ 37.17	23.00
GROUP 5.....	\$ 32.06	23.00
GROUP 6.....	\$ 30.65	23.00

FOOTNOTES:

Crane operator with main boom and jib 300' or  
 longer: \$1.50

additional to the group 1 rate. Crane operator with  
 main

boom and jib 400' or longer: \$3.00 additional to the  
 group  
 1 rate.

PAID HOLIDAYS: New Year's Day, Memorial Day,  
 Fourth of July,  
 Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR  
 CLASSIFICATIONS:

GROUP 1: Crane Operator with main boom & jib  
 400', 300', or  
 220' or longer.

GROUP 2: Crane Operator with main boom & jib  
 140' or longer,  
 Tower Crane; Gantry Crane; Whirley Derrick.

GROUP 3: Regular Equipment Operator, Crane,  
 Dozer, Loader,

Rates Fringes

OPERATOR: Power Equipment  
 (Underground construction  
 (including sewer))

	Rates	Fringes
AREA 1:		
GROUP 1.....	\$ 32.03	23.35
GROUP 2.....	\$ 27.30	23.35
GROUP 3.....	\$ 26.57	23.35
GROUP 4.....	\$ 26.00	23.35
AREA 2:		
GROUP 1.....	\$ 30.32	23.35
GROUP 2.....	\$ 25.43	23.35
GROUP 3.....	\$ 24.93	23.35

GROUP 4.....\$ 24.65            23.35

POWER            EQUIPMENT            OPERATOR  
 CLASSIFICATIONS

GROUP 1: Backfiller tamper; Backhoe; Batch plant operator (concrete); Clamshell; Concrete paver (2 drums or larger); Conveyor loader (Euclid type); Crane (crawler, truck type or pile driving); Dozer; Dragline; Elevating grader; Endloader; Gradall (and similar type machine); Grader; Grader; Mechanic; Power shovel; Roller (asphalt); Scraper (self-propelled or tractor drawn); Side boom tractor (type D-4 or equivalent and larger); Slip form paver; Slope paver; Trencher (over 8 ft. digging capacity); Well drilling rig; Concrete pump with boom operator; Hydro Excavator

GROUP 2: Boom truck (power swing type boom); Crusher; Hoist; Pump (1 or more - 6-in. discharge or larger - gas or diesel- powered or powered by generator of 300 amperes or more - inclusive of generator); Side boom tractor (smaller than type D-4 or equivalent); Tractor (pneu-tired, other than backhoe or front end loader); Trencher (8-ft. digging capacity and smaller); Vac Truck

GROUP 3: Air compressors (600 cfm or larger); Air compressors (2 or more-less than 600 cfm); Boom truck (non-swinging, non- powered type boom); Concrete breaker (self-propelled or truck mounted - includes compressor); Concrete paver (1 drum-1/2 yd. or larger); Elevator (other than passenger); Maintenance person; Pump (2 or more-4-in. up to 6-in. discharge-gas or diesel powered - excluding submersible pumps); Pumpcrete machine (and similar equipment); Wagon drill (multiple); Welding machine or generator (2 or more-300 amp. or larger - gas or diesel powered)

GROUP 4: Boiler; Concrete saw (40 hp or over); Curing machine (self-propelled); Farm tractor (with attachment); Finishing

machine (concrete); Fire person; Hydraulic pipe pushing machine; Mulching equipment; Oiler; Pumps (2 or more up to 4-in. discharge, if used 3 hours or more a day, gas or diesel powered - excluding submersible pumps); Roller (other than asphalt); Stump remover; Trencher (service); Vibrating compaction equipment, self-propelled (6 ft. wide or over); End dump operator; Sweeper (Wayne type); Water wagon and Extend-a boom forklift

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 ENGI0324-006 06/01/2017

AREA 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES  
 AREA 2: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LIVINGSTON, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

Rates            Fringes

Power equipment operators:  
 (AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION)

AREA 1		
GROUP 1.....	\$ 32.16	23.35
GROUP 2.....	\$ 25.43	23.35
GROUP 3.....	\$ 26.73	23.35
GROUP 4.....	\$ 24.87	23.35
GROUP 5.....	\$ 24.70	23.35
AREA 2		

GROUP 1.....	\$ 32.16	23.35
GROUP 2.....	\$ 25.28	23.35
GROUP 3.....	\$ 26.58	23.35
GROUP 4.....	\$ 24.72	23.35
GROUP 5.....	\$ 24.40	23.35

POWER EQUIPMENT OPERATOR  
CLASSIFICATIONS

GROUP 1: Asphalt plant operator; Crane operator (does not include work on bridge construction projects when the crane operator is erecting structural components); Dragline operator; Shovel operator; Locomotive operator; Paver operator (5 bags or more); Elevating grader operator; Pile driving operator; Roller operator (asphalt); Blade grader operator; Trenching machine operator (ladder or wheel type); Auto-grader; Slip form paver; Self-propelled or tractor-drawn scraper; Conveyor loader operator (Euclid type); Endloader operator (1 yd. capacity and over); Bulldozer; Hoisting engineer; Tractor operator; Finishing machine operator (asphalt); Mechanic; Pump operator (6-in. discharge or over, gas, diesel powered or generator of 300 amp. or larger); Shouldering or gravel distributing machine operator (self-propelled); Backhoe (with over 3/8 yd. bucket); Side boom tractor (type D-4 or equivalent or larger); Tube finisher (slip form paving); Gradall (and similar type machine); Asphalt paver (self-propelled); Asphalt planer (self-propelled); Batch plant (concrete-central mix); Slurry machine (asphalt); Concrete pump (3 in. and over); Roto-mill; Swinging boom truck (over 12 ton capacity); Hydro demolisher (water blaster); Farm-type tractor with attached pan

GROUP 2: Screening plant operator; Washing plant operator; Crusher operator; Backhoe (with 3/8 yd. bucket or less); Side boom tractor (smaller than D-4 type or equivalent); Sweeper (Wayne type and similar equipment); Vacuum truck operator; Batch plant (concrete dry batch)

GROUP 3: Grease Truck

GROUP 4: Air compressor operator (600 cu. ft. per min or more); Air compressor operator (two or more, less than 600 cfm); Wagon drill operator; Concrete breaker; Tractor operator (farm type with attachment)

GROUP 5: Boiler fire tender; Oiler; Fire tender; Trencher (service); Flexplane operator; Cleftplane operator; Grader operator (self-propelled fine-grade or form concrete); Finishing machine operator (concrete); Boom or winch hoist truck operator; Endloader operator (under 1 yd. capacity); Roller operator (other than asphalt); Curing equipment operator (self-propelled); Concrete saw operator (40 h.p. or over); Power bin operator; Plant drier operator (asphalt); Vibratory compaction equipment operator (6 ft. wide or over); Guard post driver operator (power driven); All mulching equipment; Stump remover; Concrete pump (under 3-in.); Mesh installer (self-propelled); Tractor operator (farm type); End dump; Skid steer

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ENGI0324-007 05/01/2017

ALGER, BARAGA, CHIPPEWA, DELTA,  
DICKINSON, GOGEBIC, HOUGHTON,  
IRON, KEWEENAW, LUCE, MACKINAC  
MARQUETTE, MENOMINEE, ONTONAGON  
AND SCHOOLCRAFT COUNTIES:

Rates Fringes

OPERATOR: Power Equipment (Steel Erection)	
Compressor, welder and forklift.....	\$ 25.71 23.05
Crane operator, main boom & jib 120' or longer.....	\$ 29.46 23.05
Crane operator, main boom & jib 140' or longer.....	\$ 29.71 23.05
Crane operator, main boom & jib 220' or longer.....	\$ 29.96 23.05
Mechanic with truck and tools.....	\$ 30.46 23.05
Oiler and fireman.....	\$ 24.41 23.05
Regular operator.....	\$ 28.96 23.05

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ENGI0324-008 10/01/2015

ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM,  
 ARENAC, BARAGA, BARRY,  
 BAY, BENZIE, BERRIEN, BRANCH, CALHOUN,  
 CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GENESEE,  
 GLADWIN, GOGEBIC, GRAND  
 TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON,  
 HURON, INGHAM, IONIA,  
 IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT,  
 KEWEENAW, LAKE, LAPEER, LEELANAU,  
 LENAWEE, LIVINGSTON, LUCE,  
 MACKINAC, MACOMB, MANISTEE, MARQUETTE,  
 MASON, MECOSTA,  
 MENOMINEE, MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MONROE,  
 MUSKEGON, NEWAYGO, OAKLAND, OCEANA,  
 OGEMAW, ONTONAGON, OSCEOLA,  
 OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SAGINAW, ST.  
 CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT,  
 SHIAWASSEE, TUSCOLA,  
 VAN BUREN, WASHTENAW, WAYNE AND  
 WEXFORD COUNTIES

AREA 2: ALCONA, ALGER, ALLEGAN, ALPENA,  
 ANTRIM, ARENAC, BARAGA,  
 BARRY, BAY, BENZIE, BERRIEN, BRANCH,  
 CALHOUN, CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GENESEE,  
 GLADWIN, GOGEBIC, GRAND  
 TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON,  
 HURON, INGHAM, IONIA,  
 IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT,  
 KEWEENAW, LAKE, LAPEER, LEELANAU,  
 LENAWEE, LIVINGSTON LUCE,  
 MACKINAC, MANISTEE, MARQUETTE, MASON,  
 MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE, MONTCALM,  
 MONTMORENCY, MUSKEGON, NEWAYGO,  
 OCEANA, OGEMAW, ONTONAGON, OSCEOLA,  
 OSCODA, OTSEGO, OTTAWA,  
 PRESQUE ISLE, ROSCOMMON, SAGINAW, ST.  
 JOSEPH, SANILAC,  
 SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN  
 BUREN AND WEXFORD COUNTIES

Rates Fringes

OPERATOR: Power Equipment (Sewer Relining)		
GROUP 1.....	\$ 30.70	12.93
GROUP 2.....	\$ 29.17	12.93

SEWER RELINING CLASSIFICATIONS

GROUP 1: Operation of audio-visual closed circuit  
 TV system,  
 including remote in-ground cutter and other  
 equipment used  
 in connection with the CCTV system

GROUP 2: Operation of hot water heaters and  
 circulation  
 systems, water jettors and vacuum and mechanical  
 debris  
 removal systems

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 ENGI0325-012 05/01/2017

AREA 1: MACOMB, MONROE, OAKLAND, ST.  
 CLAIR, WASHTENAW AND WAYNE  
 COUNTIES

Rates Fringes

Power equipment operators -  
 gas distribution and duct  
 installation work:

AREA 1		
GROUP 1.....	\$ 29.73	23.30
GROUP 2.....	\$ 29.60	23.30
GROUP 3.....	\$ 28.48	23.30
GROUP 4.....	\$ 27.90	23.30
AREA 2		
GROUP 1.....	\$ 28.82	23.30
GROUP 2-A.....	\$ 28.72	23.30
GROUP 2-B.....	\$ 28.50	23.30
GROUP 3.....	\$ 27.72	23.30
GROUP 4.....	\$ 27.22	23.30

SCOPE OF WORK: The construction, installation,  
 treating and  
 reconditioning of pipelines transporting gas vapors  
 within  
 cities, towns, subdivisions, suburban areas, or within  
 private property boundaries, up to and including  
 private  
 meter settings of private industrial, governmental or  
 other  
 premises, more commonly referred to as "distribution  
 work,"  
 starting from the first metering station, connection,  
 similar or related facility, of the main or cross country  
 pipeline and including duct installation.

AREA 1:

GROUP 1: Backhoe, crane, grader, mechanic, dozer (D-6

equivalent or larger), side boom (D-4 equivalent or larger), trencher(except service), endloader (2 yd. capacity or greater).

GROUP 2: Dozer (less than D-6 equivalent), endloader (under 2

yd. capacity), side boom (under D-4 capacity), backfiller,

pumps (1 or 2 of 6-inch discharge or greater), boom truck

(with powered boom), tractor (wheel type other than backhoe

or front endloader).

GROUP 3: Tamper (self-propelled), boom truck (with non-powered boom), concrete saw (20 hp or larger), pumps (2

to 4 under 6-inch discharge), compressor (2 or more or when

one is used continuously into the second day) and trencher(service).

GROUP 4: Oiler, hydraulic pipe pushing machine, grease person

and hydrostatic testing operator.

AREA 2:

GROUP 1: Mechanic, crane (over 1/2 yd. capacity), backhoe

(over 1/2 yd. capacity), grader (Caterpillar 12 equivalent

or larger)

GROUP 2-A: Trencher(except service), backhoe (1/2 yd.

capacity or less)

GROUP 2-B: Crane (1/2 yd. capacity or less), compressor (2 or

more), dozer (D-4 equivalent or larger), endloader (1 yd.

capacity or larger), pump (1 or 2 six-inch or larger), side

boom (D-4 equivalent or larger)

GROUP 3: Backfiller, boom truck (powered), concrete saw (20

hp or larger), dozer (less than D-4 equivalent), endloader

(under 1 yd. capacity), farm tractor (with attachments),

pump (2 - 4 under six-inch capacity), side boom tractor(less than D-4 equivalent), tamper (self-propelled),

trencher service and grader maintenance

GROUP 4: Oiler, grease person and hydrostatic testing operator

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 IRON0008-007 06/01/2017

ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES:

	Rates	Fringes
Ironworker - pre-engineered metal building erector.....	\$ 23.70	6.95
IRONWORKER		
General contracts		
\$10,000,000 or greater.....	\$ 30.17	26.40
General contracts less than \$10,000,000.....	\$ 30.17	26.40

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

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 IRON0025-002 06/01/2017

ALCONA, ALPENA, ARENAC, BAY, CHEBOYGAN, CLARE, CLINTON, CRAWFORD, GENESEE, GLADWIN, GRATIOT, HURON, INGHAM, IOSCO, ISABELLA, JACKSON, LAPEER, LIVINGSTON, MACOMB, MIDLAND, MONTMORENCY, OAKLAND, OGEMAW, OSCODA, OTSEGO, PRESQUE ISLE, ROSCOMMON, SAGINAW, SANILAC, SHIAWASSEE, ST. CLAIR, TUSCOLA, WASHTENAW AND WAYNE COUNTIES:

	Rates	Fringes
Ironworker - pre-engineered metal building erector		
Alcona, Alpena, Arenac, Cheboygan, Clare, Clinton, Crawford, Gladwin, Gratiot, Huron, Ingham, Iosco, Isabella, Jackson, Lapeer, Livingston (west of Burkhardt Road), Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon, Sanilac, Shiawassee, Tuscola &		

Washtenaw (west of U.S. 23).\$ 22.17	20.13
Bay, Genesee, Lapeer, Livingston (east of Burkhardt Road), Macomb, Midland, Oakland, Saginaw, St. Clair, The University of Michigan, Washtenaw (east of U.S. 23) & Wayne...\$ 23.39	21.13
<b>IRONWORKER</b>	
Ornamental and Structural...\$ 29.99	33.43
Reinforcing.....\$ 26.57	26.90

IRON0055-005 07/01/2017

LENAWEE AND MONROE COUNTIES:

	Rates	Fringes
<b>IRONWORKER</b>		
Pre-engineered metal buildings.....\$ 23.59		19.35
All other work.....\$ 29.77		21.30

IRON0292-003 06/01/2017

BERRIEN AND CASS COUNTIES:

	Rates	Fringes
<b>IRONWORKER</b> (Including pre-engineered metal building erector).....\$ 29.30		20.96

IRON0340-001 06/19/2017

ALLEGAN, ANTRIM, BARRY, BENZIE, BRANCH,  
 CALHOUN, CHARLEVOIX,  
 EATON, EMMET, GRAND TRAVERSE, HILLSDALE,  
 IONIA, KALAMAZOO,  
 KALKASKA, KENT, LAKE, LEELANAU, MANISTEE,  
 MASON, MECOSTA,  
 MISSAUKEE, MONTCALM, MUSKEGON,  
 NEWAYGO, OCEANA, OSCEOLA,  
 OTTAWA, ST. JOSEPH, VAN BUREN AND  
 WEXFORD COUNTIES:

	Rates	Fringes
<b>IRONWORKER</b> (Including pre-engineered metal building erector).....\$ 24.43		24.67

LABO0005-006 10/01/2017

	Rates	Fringes
Laborers - hazardous waste abatement: (ALCONA, ALPENA,		

ANTRIM, BENZIE, CHARLEVOIX,  
 CHEBOYGAN, CRAWFORD, EMMET,  
 GRAND TRAVERSE, IOSCO,  
 KALKASKA, LEELANAU,  
 MISSAUKEE, MONTMORENCY,  
 OSCODA, OTSEGO, PRESQUE ISLE  
 AND WEXFORD COUNTIES - Zone  
 10)

Levels A, B or C.....\$ 17.45	12.75
class b.....\$ 18.00	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 16.45	12.75
class a.....\$ 17.00	12.85

Zone 10

Laborers - hazardous waste  
 abatement: (ALGER, BARAGA,  
 CHIPPEWA, DELTA, DICKINSON,  
 GOGEBIC, HOUGHTON, IRON,  
 KEWEENAW, LUCE, MACKINAC,  
 MARQUETTE, MENOMINEE,  
 ONTONAGON AND SCHOOLCRAFT  
 COUNTIES - Zone 11)

Levels A, B or C.....\$ 21.63	12.88
Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 20.63	12.88

Laborers - hazardous waste  
 abatement: (ALLEGAN, BARRY,  
 BERRIEN, BRANCH, CALHOUN,  
 CASS, IONIA COUNTY (except  
 the city of Portland);  
 KALAMAZOO, KENT, LAKE,  
 MANISTEE, MASON, MECOSTA,  
 MONTCALM, MUSKEGON, NEWAYGO,  
 OCEANA, OSCEOLA, OTTAWA, ST.  
 JOSEPH AND VAN BUREN COUNTIES  
 - Zone 9)

Levels A, B or C.....\$ 20.95	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 19.95	12.85

Laborers - hazardous waste  
 abatement: (ARENAC, BAY,  
 CLARE, GLADWIN, GRATIOT,  
 HURON, ISABELLA, MIDLAND,  
 OGEMAW, ROSCOMMON, SAGINAW  
 AND TUSCOLA COUNTIES - Zone 8)

Levels A, B or C.....\$ 20.65	12.85
Work performed in	

conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 19.65	12.85
Laborers - hazardous waste abatement: (CLINTON, EATON AND INGHAM COUNTIES; IONIA COUNTY (City of Portland); LIVINGSTON COUNTY (west of Oak Grove Rd., including the City of Howell) - Zone 6) Levels A, B or C.....\$ 24.65 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 23.65	12.85
Laborers - hazardous waste abatement: (GENESEE, LAPEER AND SHIAWASSEE COUNTIES - Zone 7) Levels A, B or C.....\$ 23.61 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 22.61	13.41
Laborers - hazardous waste abatement: (HILLSDALE, JACKSON AND LENAWEЕ COUNTIES - Zone 4) Levels A, B or C.....\$ 24.19 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 23.19	12.85
Laborers - hazardous waste abatement: (LIVINGSTON COUNTY (east of Oak Grove Rd. and south of M-59, excluding the city of Howell); AND WASHTENAW COUNTY - Zone 3) Levels A, B or C.....\$ 29.70 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 28.70	14.20
Laborers - hazardous waste abatement: (MACOMB AND WAYNE COUNTIES - Zone 1) Levels A, B or C.....\$ 28.35 Work performed in	16.75

conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 27.35	16.75
Laborers - hazardous waste abatement: (MONROE COUNTY - Zone 4) Levels A, B or C.....\$ 30.85 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 29.84	14.45
Laborers - hazardous waste abatement: (OAKLAND COUNTY and the Northeast portion of LIVINGSTON COUNTY bordered by Oak Grove Road on the West and M-59 on the South - Zone 2) Level A, B, C.....\$ 28.85 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 27.85	16.75
Laborers - hazardous waste abatement: (SANILAC AND ST. CLAIR COUNTIES - Zone 5) Levels A, B or C.....\$ 25.19 Work performed in conjunction with site preparation not requiring the use of personal protective equipment; Also, Level D.....\$ 24.19	15.86

LABO0259-001 09/01/2017

AREA 1: MACOMB, OAKLAND AND WAYNE COUNTIES  
AREA 2: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GENESEE, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEЕ, LIVINGSTON, LUCE,

MACKINAC, MANISTEE, MARQUETTE, MASON,  
 MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE, MONROE, MONTCALM,  
 MONTMORENCY, MUSKEGON,  
 NEWAYGO, OCEANA, OGEMAW, ONTONAGON,  
 OSCEOLA, OSCODA, OTSEGO,  
 OTTAWA, PRESQUE ISLE, ROSCOMMON,  
 SAGINAW, ST. CLARE, ST.  
 JOSEPH, SANILAC, SCHOOLCRAFT,  
 SHIAWASSEE, TUSCOLA, VAN BUREN,  
 WASHTENAW AND WEXFORD COUNTIES

pusher, carrier, concrete, concrete form, concrete  
 repair,  
 cement invert laborer, cement finisher, concrete  
 shoveler,  
 conveyor, floor, gasoline and electric tool operator,  
 gunite, grout operator, welder, heading dinky person,  
 inside lock tender, pea gravel operator, pump,  
 outside lock  
 tender, scaffold, top signal person, switch person,  
 track,  
 tugger, utility person, vibrator, winch operator, pipe  
 jacking, wagon drill and air track operator and  
 concrete  
 saw operator (under 40 h.p.)

Rates Fringes

Laborers - tunnel, shaft and  
 caisson:

AREA 1		
GROUP 1.....	\$ 22.22	16.75
GROUP 2.....	\$ 22.33	16.75
GROUP 3.....	\$ 22.39	16.75
GROUP 4.....	\$ 22.57	16.75
GROUP 5.....	\$ 22.82	16.75
GROUP 6.....	\$ 23.15	16.75
GROUP 7.....	\$ 16.43	16.75
AREA 2		
GROUP 1.....	\$ 23.75	12.85
GROUP 2.....	\$ 23.84	12.85
GROUP 3.....	\$ 23.94	12.85
GROUP 4.....	\$ 24.10	12.85
GROUP 5.....	\$ 24.38	12.85
GROUP 6.....	\$ 24.67	12.85
GROUP 7.....	\$ 16.94	12.85

GROUP 4: Tunnel, shaft and caisson mucker,  
 bracer, liner  
 plate, long haul dinky driver and well point

GROUP 5: Tunnel, shaft and caisson miner, drill  
 runner, key  
 board operator, power knife operator, reinforced  
 steel or  
 mesh (e.g. wire mesh, steel mats, dowel bars, etc.)

GROUP 6: Dynamite and powder

GROUP 7: Restoration laborer, seeding, sodding,  
 planting,  
 cutting, mulching and top soil grading; and the  
 restoration  
 of property such as replacing mailboxes, wood chips,  
 planter boxes, flagstones, etc.

SCOPE OF WORK: Tunnel, shaft and caisson work  
 of every type  
 and description and all operations incidental thereto,  
 including, but not limited to, shafts and tunnels for  
 sewers, water, subways, transportation, diversion,  
 sewerage, caverns, shelters, aquifers, reservoirs,  
 missile  
 silos and steel sheeting for underground  
 construction.

TUNNEL LABORER CLASSIFICATIONS

GROUP 1: Tunnel, shaft and caisson laborer, dump,  
 shanty, hog  
 house tender, testing (on gas) and watchman

GROUP 2: Manhole, headwall, catch basin builder,  
 bricklayer  
 tender, mortar machine and material mixer

GROUP 3: Air tool operator (jackhammer, bush  
 hammer and  
 grinder), first bottom, second bottom, cage tender,  
 car

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 LABO0334-001 09/01/2017

Rates Fringes

Laborers - open cut:

ZONE 1 - MACOMB, OAKLAND  
 AND WAYNE COUNTIES:

GROUP 1.....	\$ 22.07	16.70
GROUP 2.....	\$ 22.18	16.75
GROUP 3.....	\$ 22.23	16.75
GROUP 4.....	\$ 22.31	16.75
GROUP 5.....	\$ 22.37	16.75
GROUP 6.....	\$ 19.82	16.75
GROUP 7.....	\$ 16.44	16.75

ZONE 2 - LIVINGSTON COUNTY  
 (east of M-151 (Oak Grove  
 Rd.)); MONROE AND  
 WASHTENAW COUNTIES:

GROUP 1.....	\$ 23.40	12.85
GROUP 2.....	\$ 23.51	12.85
GROUP 3.....	\$ 23.63	12.85
GROUP 4.....	\$ 23.70	12.85
GROUP 5.....	\$ 23.85	12.85
GROUP 6.....	\$ 21.15	12.85

GROUP 7.....	\$ 17.79	12.85
ZONE 3 - CLINTON, EATON, GENESEE, HILLSDALE AND INGHAM COUNTIES; IONIA COUNTY (City of Portland); JACKSON, LAPEER AND LENAWEE COUNTIES; LIVINGSTON COUNTY (west of M-151 Oak Grove Rd.); SANILAC, ST. CLAIR AND SHIAWASSEE COUNTIES:		
GROUP 1.....	\$ 21.59	12.85
GROUP 2.....	\$ 21.73	12.85
GROUP 3.....	\$ 21.85	12.85
GROUP 4.....	\$ 21.90	12.85
GROUP 5.....	\$ 22.04	12.85
GROUP 6.....	\$ 19.34	12.85
GROUP 7.....	\$ 16.49	12.85
ZONE 4 - ALCONA, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE, GRATIOT AND HURON COUNTIES; IONIA COUNTY (EXCEPT THE CITY OF PORTLAND); IOSCO, ISABELLA, KALAMAZOO, KALKASKA, KENT, LAKE,LEELANAU, MANISTEE, MASON, MECOSTA, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES:		
GROUP 1.....	\$ 20.60	12.85
GROUP 2.....	\$ 20.73	12.85
GROUP 3.....	\$ 20.84	12.85
GROUP 4.....	\$ 20.91	12.85
GROUP 5.....	\$ 21.03	12.85
GROUP 6.....	\$ 18.25	12.85
GROUP 7.....	\$ 16.59	12.85
ZONE 5 - ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES:		
GROUP 1.....	\$ 20.81	12.85
GROUP 2.....	\$ 20.95	12.85

GROUP 3.....	\$ 21.08	12.85
GROUP 4.....	\$ 21.13	12.85
GROUP 5.....	\$ 21.18	12.85
GROUP 6.....	\$ 18.56	12.85
GROUP 7.....	\$ 16.67	12.85

SCOPE OF WORK:

Open cut construction work shall be construed to mean work which requires the excavation of earth including industrial, commercial and residential building site excavation and preparation, land balancing, demolition and removal of concrete and underground appurtenances, grading, paving, sewers, utilities and improvements; retention, oxidation, flocculation and irrigation facilities, and also including but not limited to underground piping, conduits, steel sheeting for underground construction, and all work incidental thereto, and general excavation. For all areas except the Upper Peninsula, open cut construction work shall also be construed to mean waterfront work, piers, docks, seawalls, breakwalls, marinas and all incidental work. Open cut construction work shall not include any structural modifications, alterations, additions and repairs to buildings, or highway work, including roads, streets, bridge construction and parking lots or steel erection work and excavation for the building itself and back filling inside of and within 5 ft. of the building and foundations, footings and piers for the building. Open cut construction work shall not include any work covered under Tunnel, Shaft and Caisson work.

OPEN CUT LABORER CLASSIFICATIONS

GROUP 1: Construction laborer

GROUP 2: Mortar and material mixer, concrete form person, signal person, well point person, manhole, headwall and catch basin builder, headwall, seawall, breakwall and dock builder

GROUP 3: Air, gasoline and electric tool operator, vibrator operator, driller, pump person, tar kettle operator, bracer, rodder, reinforced steel or mesh person (e.g., wire mesh, steel mats, dowel bars, etc.), welder, pipe jacking and boring person, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tugger person and directional boring person

GROUP 4: Trench or excavating grade person

GROUP 5: Pipe layer (including crock, metal pipe, multi-plate or other conduits)

GROUP 6: Grouting man, audio-visual television operations and all other operations in connection with closed circuit television inspection, pipe cleaning and pipe relining work and the installation and repair of water service pipe and appurtenances

GROUP 7: Restoration laborer, seeding, sodding, planting, cutting, mulching and top soil grading; and the restoration of property such as replacing mailboxes, wood chips, planter boxes, flagstones, etc.

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 \* LABO0465-001 06/01/2018

LABORER: Highway, Bridge and Airport Construction

AREA 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES

AREA 2: ALLEGAN, BARRY, BAY, BERRIEN, BRANCH, CALHOUN, CASS, CLINTON, EATON, GRATIOT, HILLSDALE, HURON, INGHAM, JACKSON, KALAMAZOO, LAPEER, LENAWEE, LIVINGSTON, MIDLAND, MUSKEGON, SAGINAW, SANILAC, SHIAWASSEE, ST. CLAIR, ST. JOSEPH, TUSCOLA AND VAN BUREN COUNTIES

AREA 3: ALCONA, ALPENA, ANTRIM, ARENAC, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE,

IONIA, IOSCO, ISABELLA, KALKASKA, KENT, LAKE, LEELANAU, MANISTEE, MASON, MECOSTA, MISSAUKEE, MONTCALM, MONTMORENCY, NEWAYGO, OCEANA, OGEMAW, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON AND WEXFORD COUNTIES

AREA 4: ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES

	Rates	Fringes
LABORER (AREA 1)		
GROUP 1.....	\$ 26.12	12.85
GROUP 2.....	\$ 26.25	12.85
GROUP 3.....	\$ 26.43	12.85
GROUP 4.....	\$ 26.51	12.85
GROUP 5.....	\$ 26.72	12.85
GROUP 6.....	\$ 27.02	12.85
LABORER (AREA 2)		
GROUP 1.....	\$ 24.02	12.85
GROUP 2.....	\$ 24.22	12.85
GROUP 3.....	\$ 24.46	12.85
GROUP 4.....	\$ 24.81	12.85
GROUP 5.....	\$ 24.68	12.85
GROUP 6.....	\$ 25.02	12.85
LABORER (AREA 3)		
GROUP 1.....	\$ 23.27	12.85
GROUP 2.....	\$ 23.48	12.85
GROUP 3.....	\$ 23.77	12.85
GROUP 4.....	\$ 24.21	12.85
GROUP 5.....	\$ 23.83	12.85
GROUP 6.....	\$ 24.26	12.85
LABORER (AREA 4)		
GROUP 1.....	\$ 23.32	12.85
GROUP 2.....	\$ 23.53	12.85
GROUP 3.....	\$ 23.82	12.85
GROUP 4.....	\$ 24.26	12.85
GROUP 5.....	\$ 23.88	12.85
GROUP 6.....	\$ 24.31	12.85

LABORER CLASSIFICATIONS

GROUP 1: Asphalt shoveler or loader; asphalt plant misc.; burlap person; yard person; dumper (wagon, truck, etc.); joint filling laborer; miscellaneous laborer; unskilled laborer; sprinkler laborer; form setting laborer; form stripper; pavement reinforcing; handling and placing (e.g., wire mesh, steel mats, dowel bars); mason's tender or

bricklayer's tender on manholes; manhole builder; headwalls, etc.; waterproofing,(other than buildings) seal coating and slurry mix, shoring, underpinning; pressure grouting; bridge pin and hanger removal; material recycling laborer; horizontal paver laborer (brick, concrete, clay, stone and asphalt); ground stabilization and modification laborer; grouting; waterblasting; top person; railroad track and trestle laborer; carpenters' tender; guard rail builders' tender; earth retention barrier and wall and M.S.E. wall installer's tender; highway and median installer's tender(including sound, retaining, and crash barriers); fence erector's tender; asphalt raker tender; sign installer; remote control operated equipment.

GROUP 2: Mixer operator (less than 5 sacks); air or electric tool operator (jackhammer, etc.); spreader; boxperson (asphalt, stone, gravel); concrete paddler; power chain saw operator; paving batch truck dumper; tunnel mucker (highway work only); concrete saw (under 40 h.p.) and dry pack machine; roto-mill grounds person.

GROUP 3: Tunnel miner (highway work only); finishers tenders; guard rail builders; highway and median barrier installer; earth retention barrier and wall and M.S.E. wall installer's (including sound, retaining and crash barriers); fence erector; bottom person; powder person; wagon drill and air track operator; diamond and core drills; grade checker; certified welders; curb and side rail setter's tender.

GROUP 4: Asphalt raker

GROUP 5: Pipe layers, oxy-gun

GROUP 6: Line-form setter for curb or pavement; asphalt screed checker/screw man on asphalt paving machines.

Rates Fringes

LABORER (DISTRIBUTION WORK)		
Zone 1.....	\$ 20.27	12.85
Zone 2.....	\$ 18.59	12.85
Zone 3.....	\$ 16.76	12.85
Zone 4.....	\$ 16.12	12.85
Zone 5.....	\$ 16.12	12.85

DISTRIBUTION WORK - The construction, installation, treating and reconditioning of distribution pipelines transporting coal, oil, gas or other similar materials, vapors or liquids, including pipelines within private property boundaries, up to and including the meter settings on residential, commercial, industrial, institutional, private and public structures. All work covering pumping stations and tank farms not covered by the Building Trades Agreement. Other distribution lines with the exception of sewer, water and cable television are included.

Underground Duct Layer Pay: \$.40 per hour above the base pay rate.

- Zone 1 - Macomb, Oakland and Wayne
- Zone 2 - Monroe and Washtenaw
- Zone 3 - Bay, Genesee, Lapeer, Midland, Saginaw, Sanilac, Shiawassee and St. Clair
- Zone 4 - Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon and Schoolcraft
- Zone 5 - Remaining Counties in Michigan

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 PAIN0022-002 07/01/2008

HILLSDALE, JACKSON AND LENAWEE COUNTIES;  
 LIVINGSTON COUNTY  
 (east of the eastern city limits of Howell, not including the city of Howell, north to the Genesee County line and south to the Washtenaw County line); MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES:

Rates Fringes

PAINTER.....	\$ 25.06	14.75
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 \* LABO1076-005 04/01/2018

MICHIGAN STATEWIDE

FOOTNOTES: For all spray work and journeyman rigging for spray work, also blowing off, \$0.80 per hour additional (applies only to workers doing rigging for spray work on off the floor work. Does not include setting up or moving rigging on floor surfaces, nor does it apply to workers engaged in covering up or tending spray equipment. For all sandblasting and spray work performed on highway bridges, overpasses, tanks or steel, \$0.80 per hour additional. For all brushing, cleaning and other preparatory work (other than spraying or steeplejack work) at scaffold heights of fifty (50) feet from the ground or higher, \$0.50 per hour additional. For all preparatorial work and painting performed on open steel under forty (40) feet when no scaffolding is involved, \$0.50 per hour additional. For all swing stage work-window jacks and window belts-exterior and interior, \$0.50 per hour additional. For all spray work and sandblaster work to a scaffold height of forty (40) feet above the floor level, \$0.80 per hour additional. For all preparatorial work and painting on all highway bridges or overpasses up to forty (40) feet in height, \$0.50 per hour additional. For all steeplejack work performed where the elevation is forty (40) feet or more, \$1.25 per hour additional.

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 PAIN0312-001 06/12/2014

EXCLUDES: ALLEGAN COUNTY (Townships of Dorr, Fillmore, Heath, Hopkins, Laketown, Leighton, Manlius, Monterey, Overisel, Salem, Saugatuck and Wayland); INCLUDES: Barry, Berrien, Branch, Calhoun, Cass, Hillsdale, Kalamazoo, St. Joseph, Van Buren

Rates Fringes

PAINTER		
Brush and roller.....	\$ 21.75	11.94
Spray, Sandblast, Sign Painting.....	\$ 22.75	11.94

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 PAIN0845-003 05/21/2014

CLINTON COUNTY; EATON COUNTY (does not include the townships of Bellevue and Olivet); INGHAM COUNTY; IONIA COUNTY (east of Hwy. M 66); LIVINGSTON COUNTY (west of the eastern city limits of Howell, including the city of Howell, north to the Genesee County line and south to the Washtenaw County line); AND SHIAWASSEE COUNTY (Townships of Bennington, Laingsbury and Perry):

Rates Fringes

PAINTER.....	\$ 21.89	11.85
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 PAIN0845-015 05/21/2014

MUSKEGON COUNTY; NEWAYGO COUNTY (except the Townships of Barton, Big Prairie, Brooks, Croton, Ensley, Everett, Goodwell, Grant, Home, Monroe, Norwich and Wilcox); OCEANA COUNTY; OTTAWA COUNTY (except the townships of Allendale, Blendone, Chester, Georgetown, Holland, Jamestown, Olive, Park, Polkton, Port Sheldon, Tallmadge, Wright and Zeeland):

Rates Fringes

PAINTER.....	\$ 21.89	11.85
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 PAIN0845-018 05/21/2014

ALLEGAN COUNTY (Townships of Dorr, Fillmore, Heath, Hopkins, Laketown, Leighton, Manlius, Monterey, Overisel, Salem, Saugatuck and Wayland); IONIA COUNTY (west of Hwy. M-66); KENT, MECOSTA AND MONTCALM COUNTIES; NEWAYGO COUNTY (Townships of Barton, Big Prairie, Brooks, Croton, Ensley, Everett, Goodwell,

Grant, Home, Monroe, Norwich and Wilcox);  
 OSCEOLA COUNTY (south of Hwy. #10); OTTAWA COUNTY (Townships of Allendale, Blendone, Chester, Georgetown, Holland, Jamestown, Olive, Park, Polkton, Port Sheldon, Tallmadge, Wright and Zeeland):

Rates Fringes

PAINTER.....\$ 21.89 11.85

FOOTNOTES: Lead abatement work: \$1.00 per hour additional.

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 PAIN1011-003 06/05/2014

ALGER, BARAGA, CHIPPEWA, DELTA,  
 DICKINSON, GOGEBIC, HOUGHTON,  
 IRON, KEWEENAW, LUCE, MACKINAC,  
 MARQUETTE, MENOMINEE, ONTONAGON  
 AND SCHOOLCRAFT COUNTIES:

Rates Fringes

PAINTER.....\$ 24.15 10.52

FOOTNOTES: High pay (bridges, overpasses, watertower): 30 to 80 ft.: \$.65 per hour additional. 80 ft. and over: \$1.30 per hour additional.

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 PAIN1474-002 06/01/2010

HURON COUNTY; LAPEER COUNTY (east of Hwy. M-53); ST. CLAIR, SANILAC AND TUSCOLA COUNTIES:

Rates Fringes

PAINTER.....\$ 23.79 12.02

FOOTNOTES: Lead abatement work: \$1.00 per hour additional.  
 Work with any hazardous material: \$1.00 per hour additional. Sandblasting, steam cleaning and acid cleaning: \$1.00 per hour additional. Ladder work at or above 40 ft., scaffold work at or above 40 ft., swing stage, boatswain chair, window jacks and all work performed over a falling height of 40 ft.: \$1.00 per hour additional. Spray gun

work, pick pullers and those handling needles, blowing off by air pressure, and any person rigging (setting up and moving off the ground): \$1.00 per hour additional. Steeplejack, tanks, gas holders, stacks, flag poles, radio towers and beacons, power line towers, bridges, etc.: \$1.00 per hour additional, paid from the ground up.

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 PAIN1803-003 06/01/2017

ALCONA, ALPENA, ANTRIM, ARENAC, BAY, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE, GRATIOT, IOSCO, ISABELLA, KALKASKA, LAKE, LEELANAU, MANISTEE, MASON, MIDLAND, MISSAUKEE, MONTMORENCY AND OGEMAW COUNTIES; OSCEOLA COUNTY (north of Hwy. #10); OSCODA, OTSEGO, PRESQUE ISLE, ROSCOMMON, SAGINAW AND WEXFORD COUNTIES:

Rates Fringes

PAINTER

Work performed on water, bridges over water or moving traffic, radio and powerline towers, elevated tanks, steeples, smoke stacks over 40 ft. of falling heights, recovery of lead-based paints and any work associated with industrial plants, except maintenance of industrial

plants.....	\$ 25.10	13.85
All other work, including maintenance of industrial plant.....	\$ 23.68	13.85

FOOTNOTES: Spray painting, sandblasting, blowdown associated with spraying and blasting, water blasting and work involving a swing stage, boatswain chair or spider: \$1.00 per hour additional. All work performed inside tanks, vessels, tank trailers, railroad cars, sewers, smoke stacks, boilers or other spaces having limited egress not including buildings, opentop tanks, pits, etc.: \$1.25 per

hour additional.

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 PLAS0514-001 06/01/2017

ZONE 1: GENESEE, LIVINGSTON, MACOMB,  
 MONROE, OAKLAND, SAGINAW,  
 WASHTENAW AND WAYNE COUNTIES

ZONE 2: ALCONA, ALGER, ALLEGAN, ALPENA,  
 ANTRIM, ARENAC, BARAGA,  
 BARRY, BAY, BENZIE, BERRIEN, BRANCH,  
 CALHOUN, CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GLADWIN,  
 GOGEBIC, GRAND TRAVERSE,  
 GRATIOT, HILLSDALE, HOUGHTON, HURON,  
 INGHAM, IONIA, IOSCO,  
 IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT, KEWEENAW,  
 LAKE, LAPEER, LEELANAU, LENAWEE, LUCE,  
 MACKINAC, MANISTEE,  
 MARQUETTE, MASON, MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MUSKEGON,  
 NEWAYGO, OCEANA, OGEMAW,  
 ONTONAGON, OSCEOLA, OSCODA, OTSEGO,  
 OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SANILAC, SCHOOLCRAFT,  
 SHIAWASSEE, ST. CLAIR, ST.  
 JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD  
 COUNTIES

Rates Fringes

CEMENT MASON/CONCRETE FINISHER		
ZONE 1.....	\$ 30.94	13.59
ZONE 2.....	\$ 29.44	13.59

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 PLUM0190-003 05/01/2015

ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM,  
 ARENAC, BARAGA, BARRY,  
 BAY, BENZIE, BERRIEN, BRANCH, CALHOUN,  
 CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GENESEE,  
 GLADWIN, GOGEBIC, GRAND  
 TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON,  
 HURON, INGHAM, IONIA,  
 IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT,  
 KEWEENAW, LAKE, LAPEER, LEELANAU,  
 LENAWEE, LIVINGSTON, LUCE,  
 MACKINAC, MACOMB, MANISTEE, MARQUETTE,  
 MASON, MECOSTA,

Rates Fringes

MENOMINEE, MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MONROE,  
 MUSKEGON, NEWAYGO, OAKLAND, OCEANA,  
 OGEMAW, ONTONAGON, OSCEOLA,  
 OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SAGINAW, ST.  
 CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT,  
 SHIAWASSEE, TUSCOLA,  
 VAN BUREN, WASHTENAW, WAYNE AND  
 WEXFORD COUNTIES

Plumber/Pipefitter - gas distribution pipeline: Welding in conjunction with gas distribution pipeline work.....	\$ 33.03	20.19
All other work:.....	\$ 24.19	12.28

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 TEAM0007-004 06/01/2017

AREA 1: ALCONA, ALGER, ALLEGAN, ALPENA,  
 ANTRIM, ARENAC, BARAGA,  
 BARRY, BAY, BENZIE, BERRIEN, BRANCH,  
 CALHOUN, CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GLADWIN,  
 GOGEBIC, GRAND TRAVERSE,  
 GRATIOT, HILLSDALE, HOUGHTON, HURON,  
 INGHAM, IONIA, IOSCO,  
 IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT, KEWEENAW,  
 LAKE, LAPEER, LEELANAU, LENAWEE, LUCE,  
 MACKINAC, MANISTEE,  
 MARQUETTE, MASON, MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MUSKEGON,  
 NEWAYGO, OCEANA, OGEMAW,  
 ONTONAGON, OSCEOLA, OSCODA, OTSEGO,  
 OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SAGINAW, SANILAC,  
 SCHOOLCRAFT, SHIAWASSEE, ST.  
 CLAIR, ST. JOSEPH, TUSCOLA, VAN BUREN AND  
 WEXFORD COUNTIES

AREA 2: GENESEE, LIVINGSTON, MACOMB,  
 MONROE, OAKLAND, WASHTENAW  
 AND WAYNE COUNTIES

TRUCK DRIVER

AREA 1		
Euclids, double bottoms and lowboys.....	\$ 25.05	.50 + a+b

Trucks under 8 cu. yds.....\$ 24.80 .50 + a+b  
 Trucks, 8 cu. yds. and  
 over.....\$ 24.90 .50 + a+b

AREA 2

Euclids, double bottomms  
 and lowboys.....\$ 24.895 .50 + a+b  
 Euclids, double bottoms  
 and lowboys.....\$ 25.15 .50 + a+b  
 Trucks under 8 cu. yds.....\$ 24.90 .50 + a+b  
 Trucks, 8 cu. yds. and  
 over.....\$ 25.00 .50 + a+b

Footnote:

- a. \$455.00 per week
- b. \$64.40 daily

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 TEAM0247-004 04/01/2013

AREA 1: ALCONA, ALGER, ALLEGAN, ALPENA,  
 ANTRIM, ARENAC, BARAGA,  
 BARRY, BAY, BENZIE, BERRIEN, BRANCH,  
 CALHOUN, CASS, CHARLEVOIX,  
 CHEBOYGAN, CHIPPEWA, CLARE, CLINTON,  
 CRAWFORD, DELTA,  
 DICKINSON, EATON, EMMET, GLADWIN,  
 GOGEBIC, GRAND TRAVERSE,  
 GRATIOT, HILLSDALE, HOUGHTON, HURON,  
 INGHAM, IONIA, IOSCO,  
 IRON, ISABELLA, JACKSON, KALAMAZOO,  
 KALKASKA, KENT, KEWEENAW,  
 LAKE, LAPEER, LEELANAU, LENAWEE, LUCE,  
 MACKINAC, MANISTEE,  
 MARQUETTE, MASON, MECOSTA, MENOMINEE,  
 MIDLAND, MISSAUKEE,  
 MONTCALM, MONTMORENCY, MUSKEGON,  
 NEWAYGO, OCEANA, OGEMAW,  
 ONTONAGON, OSCEOLA, OSCODA, OTSEGO,  
 OTTAWA, PRESQUE ISLE,  
 ROSCOMMON, SANILAC, SCHOOLCRAFT,  
 SHIAWASSEE, SAGINAW, ST.  
 CLAIR, ST. JOSEPH, TUSCOLA, VAN BUREN AND  
 WEXFORD COUNTIES

AREA 2: GENESEE, LIVINGSTON, MACOMB,  
 MONROE, OAKLAND,  
 WASHTENAW AND WAYNE COUNTIES

Rates Fringes

Sign Installer

AREA 1  
 GROUP 1.....\$ 21.78 11.83  
 GROUP 2.....\$ 25.27 11.8375  
 AREA 2  
 GROUP 1.....\$ 22.03 11.83  
 GROUP 2.....\$ 25.02 11.8375

FOOTNOTE:

a. \$132.70 per week, plus \$17.80 per day.

SIGN INSTALLER CLASSIFICATIONS:

GROUP 1: performs all necessary labor and uses all  
 tools  
 required to construct and set concrete forms required  
 in  
 the installation of highway and street signs

GROUP 2: performs all miscellaneous labor, uses all  
 hand and  
 power tools, and operates all other equipment,  
 mobile or  
 otherwise, required for the installation of highway  
 and  
 street signs

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 TEAM0247-010 04/01/2017

AREA 1: LAPEER AND SHIAWASSEE COUNTIES

AREA 2: GENESEE, MACOMB, MONROE,  
 OAKLAND, ST. CLAIR, WASHTENAW  
 AND WAYNE COUNTIES

Rates Fringes

TRUCK DRIVER (Underground  
 construction)

AREA 1  
 GROUP 1.....\$ 23.57 19.04  
 GROUP 2.....\$ 23.66 19.04  
 GROUP 3.....\$ 23.87 19.04  
 AREA 2  
 GROUP 1.....\$ 23.87 19.04  
 GROUP 2.....\$ 24.01 19.04  
 GROUP 3.....\$ 24.20 19.04

PAID HOLIDAYS: New Year's Day, Memorial Day,  
 Fourth of July,  
 Labor Day, Thanksgiving Day and Christmas Day.

SCOPE OF WORK: Excavation, site preparation,  
 land balancing,  
 grading, sewers, utilities and improvements; also  
 including  
 but not limited to, tunnels, underground piping,  
 retention,  
 oxidation, flocculation facilities, conduits, general  
 excavation and steel sheeting for underground  
 construction.

Underground construction work shall not include any  
 structural modifications, alterations, additions and  
 repairs to buildings or highway work, including roads,

streets, bridge construction and parking lots or steel erection.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Truck driver on all trucks (EXCEPT dump trucks of 8 cubic yards capacity or over, pole trailers, semis, low boys, Euclid, double bottom and fuel trucks)

GROUP 2: Truck driver on dump trucks of 8 cubic yards capacity or over, pole trailers, semis and fuel trucks

GROUP 3: Truck driver on low boy, Euclid and double bottom

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 SUMI2002-001 05/01/2002

	Rates	Fringes
Flag Person.....	\$ 10.10	0.00
LINE PROTECTOR (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE)....	\$ 18.98	12.85
LINE PROTECTOR (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE).....	\$ 17.14	12.85
Pavement Marking Machine (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES) Group 1.....	\$ 25.74	12.85
Pavement Marking Machine (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE) Group 2.....	\$ 23.17	12.85
Pavement Marking Machine (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES) Group 1.....	\$ 23.67	12.85
Pavement Marking Machine (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE) Group 2.....	\$ 21.30	12.85

WORK CLASSIFICATIONS:

PAVEMENT MARKER GROUP 1: Drives or operates a truck mounted striper, grinder, blaster, groover, or thermoplastic melter for the placement or removal of temporary or permanent pavement markings or markers.

PAVEMENT MARKER GROUP 2: Performs all functions involved for the placement or removal of temporary or permanent pavement markings or markers not covered by the classification of Pavement Marker Group 1 or Line Protector.

LINE PROTECTOR: Performs all operations for the protection or removal of temporary or permanent pavement markings or markers in a moving convoy operation not performed by the classification of Pavement Marker Group 1. A moving convoy operation is comprised of only Pavement Markers Group 1 and Line Protectors.

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 WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including

preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198

indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those

classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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WAGE DETERMINATION APPEALS  
PROCESS

1.) Has there been an initial decision in the matter?  
This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the

Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====  
=====

END OF GENERAL DECISION

## **ATTACHMENT A - SCOPE OF WORK**

PROGRESS CLAUSE: Start work within ten (10) days after receiving notice of award of contract or on or before the date designated as the starting date in the Contractor's detailed Progress Schedule. In no case, shall any work be commenced prior to receipt of formal notice of award by the department.

Work on shall not begin before **Monday, August 27, 2018**.

The work on the project shall be completed on or before **Tuesday, April 30, 2019**.

The approved low bidder(s) for the work covered by this proposal will be required to participate in a pre- construction meeting with local agency owner and/or department representatives to work out a detailed progress schedule. The schedule for this meeting will be set within one week after the approved low 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 City of Battle Creek will arrange the time and place for the meeting.

The Progress Schedule shall include, as a minimum, the controlling work items for the completion of the project and the planned dates (or work day for a work day 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 shall also be included in the project schedule.

If the bidding proposal specifies 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.

**CITY OF BATTLE CREEK**

**NOTICE TO BIDDER**

**UTILITY COORDINATION**

1 of 1

The contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Section 104.07 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 109.03 of the 2012 MDOT Standard Specifications for Construction.

PUBLIC UTILITIES

The "Miss Dig" alert number is 800-482-7171. The following Public Utilities have facilities located within the Right-of-Way:

AT&T  
(telephone)  
2919 Millcork  
Kalamazoo, MI 49001  
269-384-4490  
JEFF SAYLOR

CONSUMER ENERGY CO.  
(electric)  
311 E. Michigan Ave.  
Battle Creek, MI 49017  
269-969-8595  
MATT KOEPKE

SEMCO ENERGY  
(gas)  
15851 Helmer Road  
Battle Creek, MI 49015  
269-966-0404(ext.5574)  
JULIE CONANT

COMCAST  
(cable TV)  
11921 E. M-89  
Richland, MI 49083  
269-203-7114  
JOE SCHOPT

CITY OF BATTLE CREEK  
(Water Division)  
150 S. Kendall St.  
Battle Creek, MI 49015  
269-966-3496  
MATT MILLER

CITY OF BATTLE CREEK  
(Sewer Division)  
2000 W. River Rd.  
Battle Creek, MI 49017  
269-966-3513  
BRYAN CRAWFORD

CITY OF BATTLE CREEK  
(Signs and Signals Division)  
150 S. Kendall St.  
Battle Creek, MI 49015  
269-966-3527  
MIKE HAMILTON

The owners of the existing service facilities that are within the grading or structure limits will move them, as shown on plans, to locations designated by the Engineer or will move them entirely from the Right-of-Way. Owners of Public Utilities will not be required by the City to move additional poles or structure in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operations.

ALH/07-03-18

**CITY OF BATTLE CREEK**

**NOTICE TO BIDDER**

**COORDINATION CLAUSE FOR GRADING SITES**

1 of 1

The contractor shall cooperate and coordinate construction activities with the owners of the sites that will be graded and the other properties along Buckner Drive that may be impacted as stated in Section 104.08 of the 2012 MDOT Standard Specifications for Construction. Driveway construction and trucking from or to the sites may need to be restricted during certain hours of the day, such as during shift changes, as directed by the key contacts referenced below.

Systemx

300 Buckner Drive  
Battle Creek, MI 49037  
269-719-7682

John Maurer

[John.Maurer@systemxproducts.com](mailto:John.Maurer@systemxproducts.com)

Nexthermal

1045 Harts Lake Rd.  
Battle Creek, MI 49037  
269-964-0271

Jeff Wheeler

[j.wheeler@nexthermal.com](mailto:j.wheeler@nexthermal.com)

TAP Transport

400 Buckner Drive  
Battle Creek, MI 49037  
269-209-4323

Ace Pengelly

[taptransport@yahoo.com](mailto:taptransport@yahoo.com)

At Systemx, the west driveway shall be used as ingress for hauling operations with utilizing the east driveways for hauling material out. The most easterly driveway shall be used for hauling out until it is no longer available. Operations will be suspended during shift changes as coordinated with Systemx's plant manager.

The intent of this project is to excavate material from the Systemx site and utilize the material at Nexthermal and at the WK Kellogg Airport. The Nexthermal site shall be completed first. Additional material to complete the airport grading plan shall be taken from the Columbia Avenue site that is owned by the City.

ALH/07-10-18

CITY OF BATTLE CREEK

SPECIAL PROVISION  
FOR  
MAINTAINING TRAFFIC

OHM:TEG

1 of 7

7/12/2018

**a. Description.** This work consists of all labor, materials and equipment required to maintain traffic in accordance with this special provision for the proposed roadway rehabilitation and improvements along Buckner Drive in the City of Battle Creek, Calhoun County.

**b. General.** Maintain traffic in accordance with the MDOT Standard Specifications for Construction, including any Supplemental Specifications, and as specified herein.

1. The Contractor shall notify the Engineer a minimum of 72 business hours prior to the implementation of any detours, road closures, lane closures or major traffic shifts.

2. The Contractor shall coordinate his operations with Contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA) or adjoining areas to avoid conflicts in the maintenance of traffic, construction signing, and to provide for the orderly progress of contract work.

3. City of Battle Creek's maintenance crews and/or Contract Maintenance Agencies may perform maintenance work within or adjacent to the Construction Influence Area (CIA). The City and/or Contract Maintenance Agency will coordinate their operations with the Engineer to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.

4. At the preconstruction meeting, the prime contractor needs to provide cell phone and email contact information for the prime contractor and the traffic control supplier.

**c. Construction Influence Area (CIA).** The CIA includes the right-of-way of the following roadways, including detour routes, within the approximate limits described below:

1. On Buckner Drive from Skyline Drive to the end of the Buckner Drive at the cul-de-sac.

**d. Traffic Restrictions.**

1. Provisions shall be made to maintain access for emergency vehicles, mail delivery, and waste collection vehicles at all times. At least one lane must be kept open at all times in the areas of road closures for emergency vehicle access.

2. The minimum traveled lane width shall be 12 feet on all portions of the roadway which are open to traffic during construction.

3. All lane closures shall originate and continue through the same side of the roadway. No conflicting lane closures shall be permitted. The Contractor shall not be permitted to switch from the right lane to the left lane and vice-versa.

4. Access to all businesses and residences shall be maintained at all times except as noted on the plans or as directed by the Engineer. Sole driveways shall be constructed part-width, with the use of Maintenance Gravel in order to provide access. No driveway access shall be closed without the prior approval of the Engineer. No driveway access shall be closed without prior notification to the property owner at least 3 days in advance.

5. The Contractor may work on Saturdays, at their discretion, subject to local ordinances. No work shall be performed on Sundays or after normal work hours of 7:00 am to 7:00 pm Monday through Saturday without written consent from the Engineer.

**e. Construction Staging.** Complete work in consecutive stages. Unless otherwise approved by the Engineer, work operations in preceding stage must be complete before beginning next stage. Access to all driveways shall be maintained at all times throughout the project and staging operations. Staging is as follows:

1. Pre Stage 1A.

A. Work Activities. Tree clearing, Site grading, Curb removal, temporary pavement placement on the west side of the Systex Driveway located at Sta 23+25+/- Rt.

B. Traffic Control.

(1) Maintain two-way traffic on Buckner Drive. Maintain two-way traffic on the Systex Driveway at all times.

C. Notes.

(1) Contractor must maintain access to all driveways using partial width construction. If a property is accessible by two or more driveways, alternating full driveway closures are allowed, permitted both passenger vehicles and trucks can maneuver the driveway.

2. Stage 1.

A. Work Activities. Site grading, Systex site work, Curb removal, temporary pavement placement, approach and curb placement, base and leveling course placement, and drainage improvements on Buckner Drive from The Systex Driveway (Sta 23+25) to the POE at Sta 29+00.

B. Traffic Control.

(1) Maintain two-way traffic on the existing Buckner Drive up to the future TAP Driveway. Two-way traffic will be maintained on one lane to the TAP property at Sta 24+75 in accordance with the Maintaining Traffic plan sheets.

(2) During Stage 1, maintain two-way traffic on the Systex Driveway (Sta 23+25). At the end of Stage 1 place temporary HMA on the east side of the driveway under flag control to maintain traffic on the south side of Buckner Road during Stage 2.

(3) Maintain two way traffic on one lane adjacent to the proposed TAP driveway. Use a steel plate to cover trenches adjacent to active traffic at the end of each work day. Steel Plate is included in the pay item Minor Traf Devices.

C. Notes.

- (1) Contractor must maintain access to all driveways by constructing them part-width. If a property is accessible by two or more driveways, alternating full driveway closures are allowed permitted both passenger vehicles and trucks can maneuver the driveway.

3. Stage 2.

A. Work Activities. Site grading, Curb removal, pavement removal, curb placement, base and leveling course placement, and drainage improvements on the north side of Buckner Drive from POB Sta 20+00 to STA 23+65.

B. Traffic Control.

- (1) Maintain two-way traffic on the south side of Buckner Drive from the POB Sta 20+00 to the east Systex Driveway Sta 24+25 using a temporary portable traffic signal (PTS) system.
  - a. Place PTS system at Sta 18+00
  - b. Place PTS system at Sta 23+90
  - c. The distance between stop bars is 670 feet
- (2) Maintain two-way traffic on Buckner Drive from Sta 24+20 to Sta 27+00 as shown on the Maintaining Traffic plan sheets.
- (2) Maintain two-way traffic on the Tap driveway at Sta 24+50 while installing the northern most (remaining) curb and gutter. Two-way traffic will be maintained on one lane in accordance with the Maintaining Traffic plan sheets.
- (3) Maintain driveway out of Systex property (Sta 23+20) utilizing the Driveway Assistance Device.

C. Notes.

- (1) Contractor must maintain access to all driveways by constructing them part-width. If a property is accessible by two or more driveways, alternating full driveway closures are allowed permitted both passenger vehicles and trucks can maneuver the driveway.

## 4. Stage 3.

## A. Work Activities.

- (1) Curb removal, curb construction, curb placement, base and leveling course placement, removal of temporary pavement and aggregate and drainage improvements on the south side of Buckner Drive from POB Sta 20+00 to STA 23+65.
- (2) Pave the Tap driveway at Sta 24+50 during off peak hours.
- (3) Install ground driven Road Ends (W14-2b) and 500 FEET (W16-2P) signs at Sta 22+00 RT prior to seasonal suspension. Maintain 3 -Type III Barricades and Road Closed sign (R11-2) at Sta 27+00 during seasonal suspension to block off road. Place 3 additional type III barricades at Sta 27+50.

## B. Traffic Control.

- (1) Maintain two-way traffic on the north side of Buckner Drive from the POB Sta 20+00 to the east Systex Driveway Sta 24+25 using a temporary portable traffic signal (PTS) system.
  - a. Place PTS system at Sta 18+00
  - b. Place PTS system at Sta 25+25
  - c. The distance between stop bars is 825 feet
- (2) Maintain two-way traffic on Buckner Drive from Sta 24+25 to Sta 27+00 as shown on the Maintaining Traffic plan sheets.
- (3) Maintain two-way traffic on the Tap driveway while paving. Two-way traffic will be maintained on one lane in accordance with the Maintaining Traffic plan sheets.
- (4) Maintain driveway out of TAP property (Sta 24+50) utilizing the Driveway Assistance Device.

## C. Notes.

- (1) Contractor must maintain access to all driveways by constructing them part-width. If a property is accessible by two or more driveways, alternating full driveway closures are allowed permitted both passenger vehicles and trucks can maneuver the driveway.

## 5. Stage 4.

## A. Work Activities.

- (1) Wearing course placement and restoration from POB Sta 20+00 to POE Sta 29+00.

## C. Traffic Control.

- (1) Maintain two-way traffic on Buckner Drive from the POB Sta 20+00 to POE Sta 29+00 using Traf Regulator Control during normal working hours.

## D. Notes.

- (1) Contractor must maintain access to all driveways by constructing them part-width. If a property is accessible by two or more driveways, alternating full driveway closures are allowed permitted both passenger vehicles and trucks can maneuver the driveway.

**f. Materials.**

## 1. Traffic Control Devices.

## A. General.

- (1) Conform all traffic control devices and their usage to the *MMUTCD*, and as specified herein.

- (2) The Contractor must furnish, place, and maintain signs, barricades, plastic drums, lights and minor traffic control devices within the CIA, and upon completion of the work, remove these items from the project.

- (3) Warning, regulatory and guide signs not required for a particular work operation, must be removed, completely covered, or laid down with the legs off, as directed by the Engineer.

- (4) Temporary signs that are to remain in place for 14 days or more shall be installed on permanent post mounts per MDOT Special Detail WZD-100-A and as directed by the Engineer. All other signs may be installed on portable supports.

- (5) All traffic control devices temporarily moved to facilitate the Contractors operation must be reset to the permanent configuration at the end of the workday. The Contractor must routinely maintain the traffic control devices including, but not limited to proper placement, weighted with sandbags, replacement of lights and replacing damaged devices. The Contractor is responsible for protecting the work area and must supply the necessary traffic control devices apart from those called for on the plans to delineate the work area from adjacent property. The location for storage of materials and equipment shall be as approved by the Engineer. Traffic control devices

used to delineate the work area from the traveled way may be placed on the crushed or gravel surface to maintain 12 ft minimum lanes, as directed by the Engineer.

B. Channelizing Devices. Required channelizing devices are Channelizing Device, 42 inch from MDOT's approved list. The maximum distance between channelizing devices is 15 feet in shifts and tapers and 15 feet in tangents, 10 feet at driveways and other locations where closer spacing is deemed necessary, as directed by the Engineer.

C. Barricades. Barricades necessary for traffic control and public safety must be furnished and erected by the Contractor as shown on the plans or as directed by the Engineer. The barricades must be lighted as shown in the MDOT Standard Specifications for Construction and the *MMUTCD*. Type III Barricades must be supplemented with two Type C warning lights. Any signs required at Type III Barricade locations must be mounted above the barricade on separate sign supports behind the barricade. All barricades must be cleaned and all lights on barricades must be checked on a weekly basis.

D. Temporary Signs.

(1) All diamond-shaped warning signs must be 48 inch by 48 inch mounted at a 7-foot minimum bottom height, unless otherwise specified in the Maintaining Traffic Typical.

E. Temporary Portable Traffic Signals

(1) Coordinate installation of temporary signals with the Engineer. Temporary signals will be paid for as PTS System, Temp, Furn and PTS System, Temp, Oper.

(2) Complete the work necessary for the placement of the temporary signals required during each construction stage prior to the start of that stage.

F. Temporary Driveway Assistance Devices

(1) Coordinate installation of temporary driveway assistance device with the Engineer. Temporary driveway device signals will be paid for as Driveway Assistance Device, Portable, Temporary.

(2) Complete the work necessary for the placement of the temporary signals required during each construction stage prior to the start of that stage.

G. Traffic Control shall be in accordance with the following MDOT Maintaining Traffic Typical and Special Details; except that in these Typical, the "Traffic Fines Doubled In Work Zones" sign (R5-18) and "Injure / Kill A Worker \$7500 + 15 Years" sign (R-18b) shall not be placed or paid for.

- o Tables for "L", "D" and "B" Values (M0020a)
- o G20 Series, Injure Kill, Double Fines, Advanced Signing Treatments (M0040a)
- o Two-lane, Two-way Roadway Where One Lane is Closed Utilizing Traffic Regulators With No Speed Reduction (M0140a)

- Typical Temporary Traffic Control for a Temporary Traffic Signal, Two-Lane Two-Way Roadway with Sign Placement on One Side of Roadway With No Speed Reduction (M0180a)
- Ground Driven Sign Supports for Temporary Signs (WZD-100-A)
- Temporary Traffic Control Devices (WZD-125-E)

**g. Other Requirements.**

1. Truck Haul Routes. Truck haul routes selected by the Contractor must be submitted to the Engineer for approval prior to the start of construction and are subject to regulations of the City of Battle Creek. The Contractor shall not use the City side streets for transporting of materials to or from the project to avoid traffic backups.

2. Work Hours. Normal working hours within the City of Battle Creek are 7:00 AM to 7:00 PM, Monday through Saturday. If the Contractor needs to schedule any work beyond these hours, the Contractor must submit this request in writing to the Engineer.

3. Additional Signing. During construction, additional signs may be required to better manage traffic. The Contractor shall promptly bring out the required signs as needed by the Engineer and per the MDOT FUSP 812C, Traffic Control Quality and Compliance.

4. Cleaning Adjacent Street and Sidewalks. Dirt, mud, construction materials, or other debris deposited on public sidewalks or streets as the result of spilling, tracking on the wheels of trucks or construction equipment, or by other actions of the Contractor, his employees, or his subcontractors shall immediately be removed by the Contractor and shall not be paid for separately.

5. Temporary Roadway Surface. The Contractor is responsible for maintaining a safe, drivable surface throughout the project, as directed by the Engineer. The Contractor shall perform regular maintenance, grading, or provide aggregate to ensure the integrity of the road surface.

**h. Measurement and Payment.**

1. The estimate of quantities for maintaining traffic on this project is based on the suggested sequence of operations contained on the Maintaining Traffic plan sheets and as described in this special provision and payment for these devices shall be in accordance with the MDOT Standard Specifications for Construction, unless otherwise specified.

2. Separate pay items are provided in the contract to compensate for the traffic maintenance outlined in the proposal. All other costs due to traffic maintenance are the responsibility of the Contractor.

3. If the Contractor suggests an alternative staging plan that expedites construction, any additional signing or maintaining traffic devices required to meet MMUTCD guidelines shall be at the Contractor's expense.



# ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING				RING AND BARRIER STRUCTURE									
<b>Controller Type:</b> <input type="checkbox"/> EPAC <input checked="" type="checkbox"/> Other: PTS System	Phase # / Description	Permissive-Protected		Protected-Only		B1		B2		B3		B4		
		Lead	Lag	Lead	Lag	R1	R2	R3	R4					
<b>System Type:</b> <input type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 Address: <input type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input checked="" type="checkbox"/> None <input type="checkbox"/> Other:														
<b>Interconnect Type:</b> <input type="checkbox"/> Hardwire <input type="checkbox"/> Fiber-Optic <input type="checkbox"/> Radio <input type="checkbox"/> Phone Drop <input checked="" type="checkbox"/> None <input type="checkbox"/> Other:														
<b>IF TBC, Synch by:</b> <input type="checkbox"/> TOD <input type="checkbox"/> Event														
<b>IF Phone Drop,</b> Phone #														
<b>Controller Status:</b> <input type="checkbox"/> Master <input type="checkbox"/> Slave <input type="checkbox"/> Isolated <input type="checkbox"/> TBC														
Master Location: Master Spot #:														
<b>VEHICULAR AND PEDESTRIAN DETECTION</b>														
Vehicle Detection				Pedestrian Detection										
Approach		Movements and Call Delay (s)		Type		Push-Button Crossing Locations								
		Left	Thru	Right	Loop			Video	Other					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
<b>ADDITIONAL DIAL SPLIT DATA</b>														
		PHASE		1	2	3	4	5	6	7	8	01	02	03
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
DIAL	SPLIT	CYCLE												
REMARKS:														
<b>ADDITIONAL OVERLAP DATA</b>														
Overlap Phase		Load	Phases	T.G. (s)	Y (s)	R (s)	-GY	+GRN						
		Bays	Overlapped											
=														
=														
=														
PREPARED BY: MLC      DATE: 07/02/18 LOCATION: Buckner Drive @ STA 18+00, 23+90 <input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input checked="" type="checkbox"/> Consultant      CONTROL SECTION: SPOT # n/a														



# ADVANCED TIMING PARAMETERS FORM

## SYSTEM INFORMATION

**Controller Type:**  
 EPAC  
 Other: PTS System

**System Type:**  
 Closed Loop  
 Stand By  
 Group 1  
 Group 2  
 Address:

TBC  
 TBC/GPS  
 None  
 Other:

If TBC, Synch by:  
 TOD  
 Event

**Interconnect Type:**  
 Hardwire  
 Fiber-Optic  
 Radio  
 Phone Drop  
 None  
 Other:

If Phone Drop,  
 Phone #

**Controller Status:**  
 Master  
 Slave  
 Isolated  
 TBC

If Slave,  
 Master Location:  
 Master Spot #:

## LEFT-TURN PHASING

Phase # / Description	Permissive-Protected		Protected-Only	
	Lead	Lag	Split	Lead
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## RING AND BARRIER STRUCTURE

B1	B2	B3	B4

## VEHICULAR AND PEDESTRIAN DETECTION

Approach	Vehicular Detection				Type	Push-Button Crossing Locations	
	Movements and Call Delay (s)	Left	Thru	Right			Loop
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

## DISAPPEARING LEGEND CASE SIGNS

Pedestrian Detection	

## ADDITIONAL DIAL SPLIT DATA

DIAL	SPLIT	CYCLE	PHASE			Yield Period
			1	2	3	
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				
DIAL	SPLIT	CYCLE				

## COORDINATION DATA

Operation Mode	0
Coordination Mode	0
Maximum Mode	0
Correction Mode	0
Offset Mode	0
Force Mode	0
Max Dwell	0
Yield Period	0

## REMARKS:

## ADDITIONAL OVERLAP DATA

Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
=							
=							
=							

PREPARED BY: MLC      DATE: 07/02/18  
 MDOT     County     City     Consultant

LOCATION:  
 Buckner Drive @ STA 18+00, 25+25  
 CONTROL SECTION-SPOT #  
 n/a

### 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

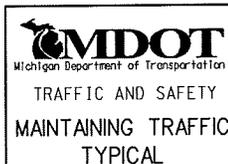
- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- TWO-WAY TRAFFIC TAPER

##### 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

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"

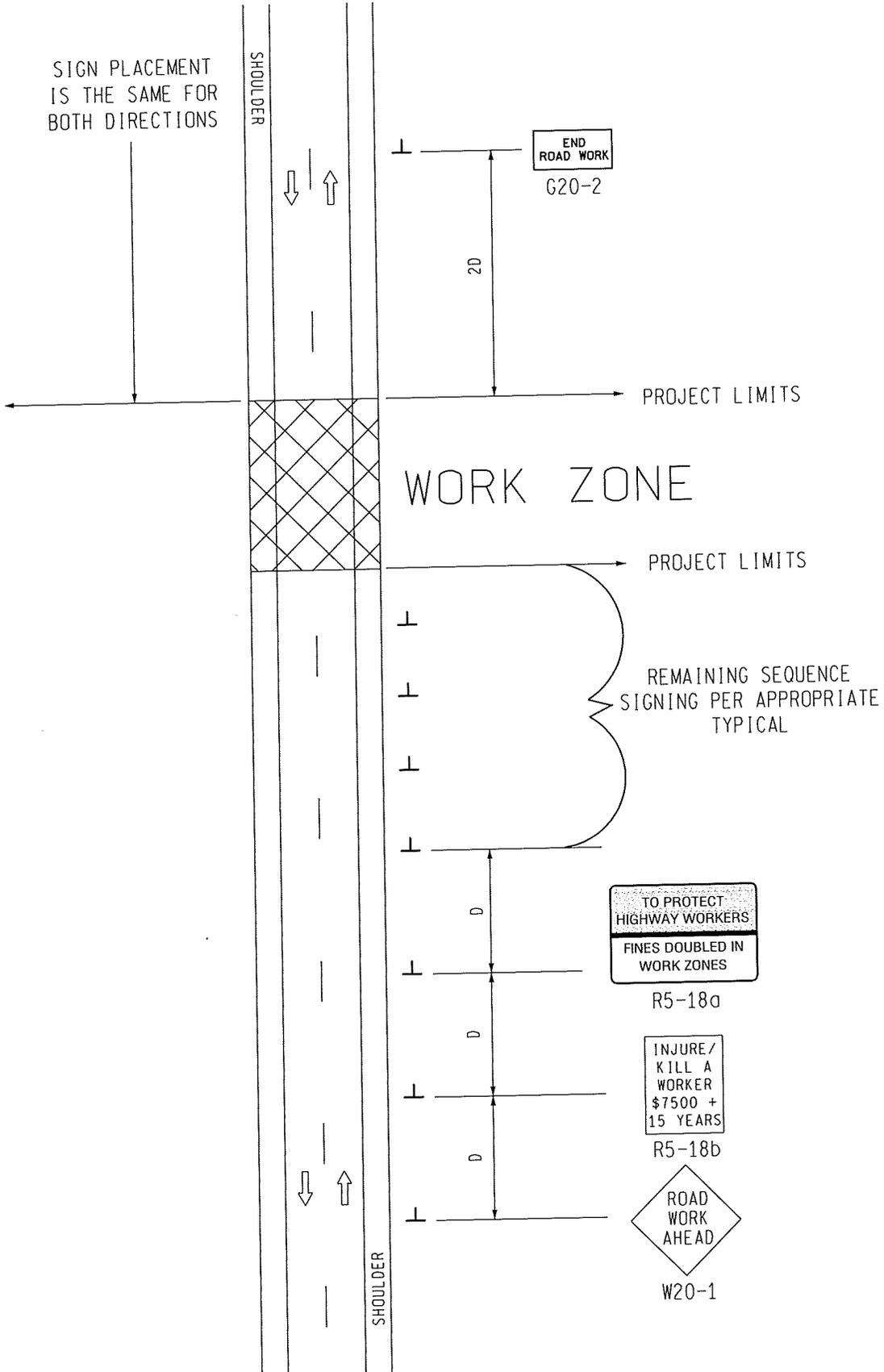
SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

\* 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

SIGN PLACEMENT IS THE SAME FOR BOTH DIRECTIONS



SIGN = 68 ft2 - TYPE B FOR ONE DIRECTION OF TRAFFIC W20-1 QUANTITY INCLUDED WITH APPROPRIATE TYPICAL FOR SEQUENCE SIGNING

**MDOT**  
Michigan Department of Transportation  
TRAFFIC AND SAFETY  
MAINTAINING TRAFFIC TYPICAL

TYPICAL ADVANCE SIGNING TREATMENT FOR LONG, INTERMEDIATE AND SHORT TERM STATIONARY WORK ZONE OPERATIONS OF LESS THAN TWO MILES IN LENGTH WHERE TRAFFIC CONTROL DEVICES MAY REMAIN AT END OF WORK DAY ON AN UNDIVIDED TWO-WAY ROADWAY

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0040a	SHEET 1 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0040a.dgn REV. 10/13/2011			

NOT TO SCALE

## NOTES

30. THE APPROPRIATE ADVANCE SIGNING SEQUENCE(S), (M0030a THROUGH M0080a) SHALL BE USED ON ALL PROJECTS.
32. THESE SIGNS SHALL BE LEFT IN PLACE AT THEIR PRESCRIBED LOCATIONS FOR THE DURATION OF THE PROJECT AND UNTIL ALL TEMPORARY TRAFFIC CONTROL HAS BEEN REMOVED.
35. THESE SIGNS ARE INTENDED TO BE USED WITHIN THE LIMITS OF THE TEMPORARY SEQUENCE SIGNING AS IS SHOWN ON 1 OF 2. THESE SIGNS ARE NOT TO BE INTERMINGLED WITH ANY OTHER TEMPORARY SEQUENCE SIGNING EXCEPT AS SHOWN.

## SIGN SIZES

G20-2	-	48" x 24"
R5-18a	-	96" x 60"
R5-18b	-	48" x 60"
W20-1	-	48" x 48"

NOT TO SCALE

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL ADVANCE SIGNING TREATMENT FOR LONG, INTERMEDIATE AND SHORT TERM STATIONARY WORK ZONE OPERATIONS OF LESS THAN TWO MILES IN LENGTH WHERE TRAFFIC CONTROL DEVICES MAY REMAIN AT END OF WORK DAY ON AN UNDIVIDED TWO-WAY ROADWAY		
	DRAWN BY: CON:AE:djf	OCTOBER 2011	M0040a
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0040a.dgn REV. 10/13/2011			

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR 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.

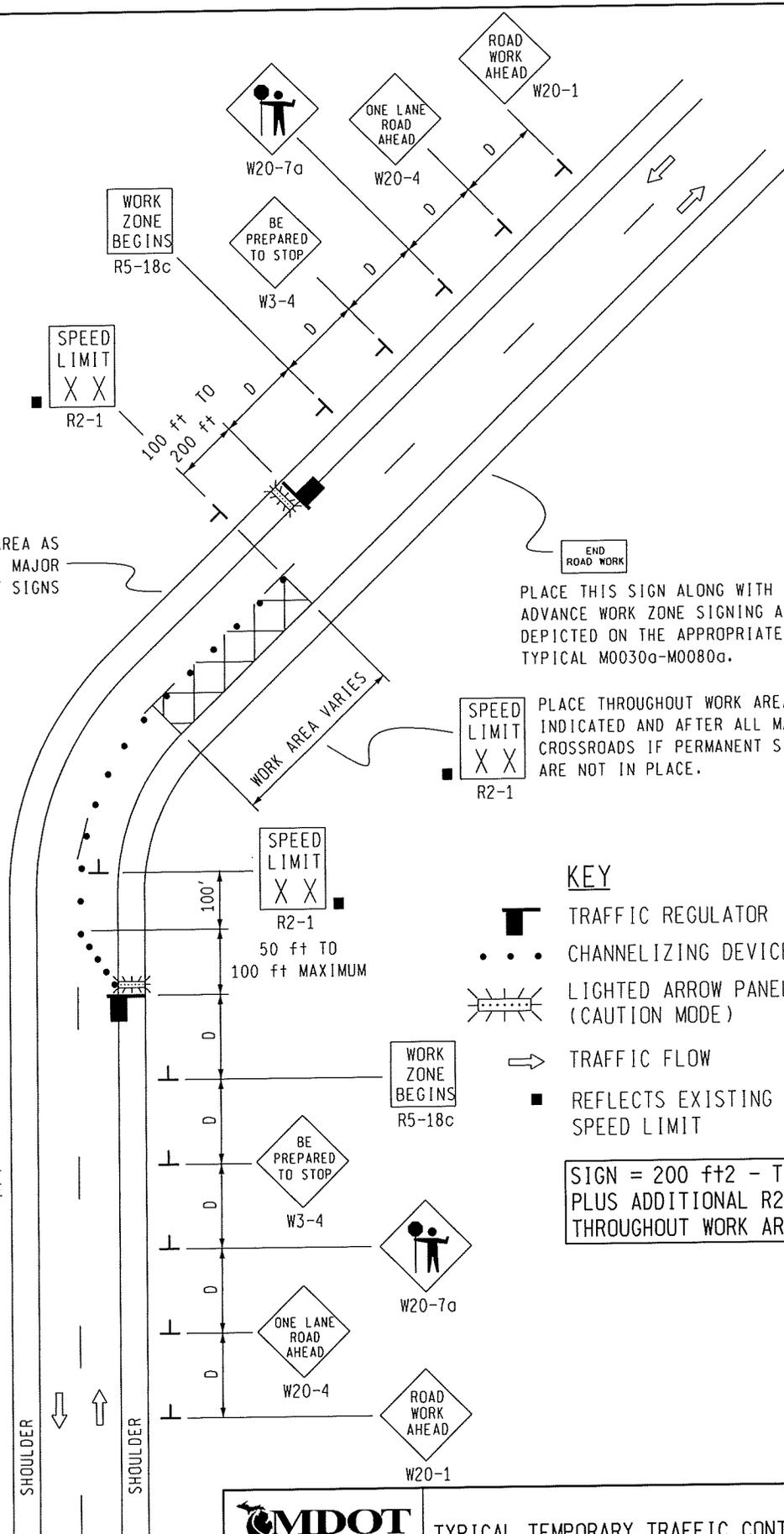
PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

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

**KEY**

-  TRAFFIC REGULATOR
-  CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
-  REFLECTS EXISTING SPEED LIMIT

SIGN = 200 ft ± 2 - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA



 Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL		TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION	
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0140a	SHEET 1 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0140a.dgn REV. 10/04/2011			

NOT TO SCALE

## NOTES

- 1H. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS  
SEE M0020a FOR "D" 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.
- 4A. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES IN THE TAPER AREA(S) SHOULD BE 15 FEET AND SHOULD BE EQUAL IN FEET TO TWICE THE POSTED SPEED IN MILES PER HOUR 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 CRASHWORTHY 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.
9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.
- 9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.
10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."
11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.
- 12E. THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS SHALL BE NO MORE THAN 2 MILES IN LENGTH UNLESS RESTRICTED FURTHER IN THE SPECIAL PROVISIONS FOR MAINTAINING TRAFFIC. ALL SEQUENCES OF MORE THAN 2 MILES IN LENGTH WILL REQUIRE WRITTEN PERMISSION FROM THE ENGINEER BEFORE PROCEEDING.
13. WHEN INTERSECTING ROADS OR SIGNIFICANT TRAFFIC GENERATORS (SHOPPING CENTERS, MOBILE HOME PARKS, ETC.) OCCUR WITHIN THE ONE-LANE TWO-WAY OPERATION, INTERMEDIATE TRAFFIC REGULATORS AND APPROPRIATE SIGNING SHALL BE PLACED AT THESE LOCATIONS.
14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.
15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.
- 28E. THE TRAFFIC REGULATORS SHOULD BE POSITIONED AT OR NEAR THE SIDE OF THE ROAD SO THAT THEY ARE SEEN CLEARLY AT A MINIMUM DISTANCE OF 500 FEET. THIS MAY REQUIRE EXTENDING THE BEGINNING OF THE LANE CLOSURE TO OVERCOME VIEWING PROBLEMS CAUSED BY HILLS AND CURVES.

### SIGN SIZES

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

 <b>TRAFFIC AND SAFETY</b> <b>MAINTAINING TRAFFIC</b> <b>TYPICAL</b>	<b>TYPICAL TEMPORARY TRAFFIC CONTROL FOR          A TWO-LANE TWO-WAY ROADWAY WHERE ONE          LANE IS CLOSED UTILIZING TRAFFIC          REGULATORS, NO SPEED REDUCTION</b>		
DRAWN BY: CON:AE:djf	OCTOBER 2011	M0140a	SHEET
CHECKED BY: BMM:CRB	PLAN DATE:		2 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0140a.dgn REV. 10/04/2011			

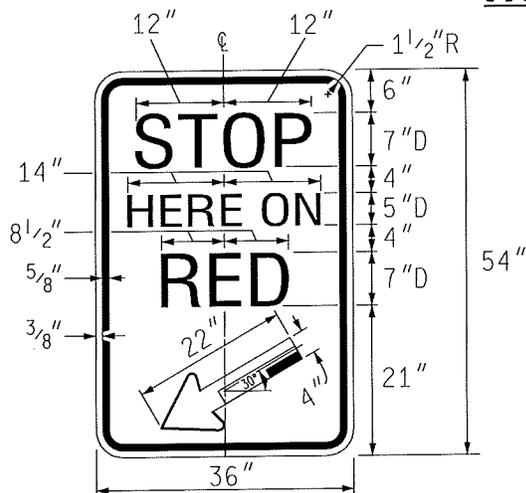
NOT TO SCALE



## NOTES

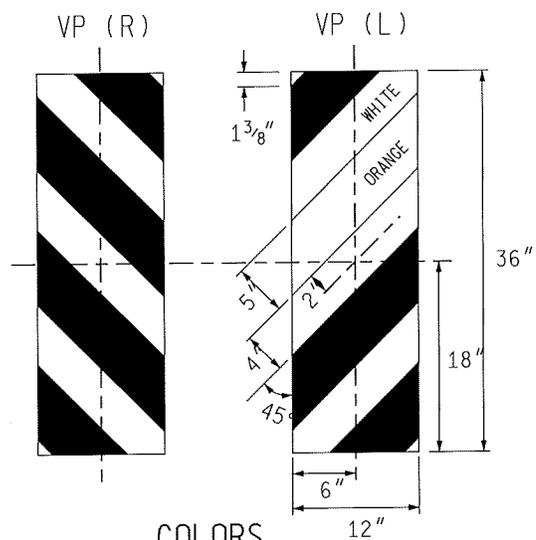
- 1A. SEE M0020a FOR "D" VALUES.
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (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.
- 4C. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES IN THE TAPER AREA(S) SHOULD BE 15 FEET.
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.
- 14A. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-3 SIGNS.
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.
22. BARRIER REFLECTORS AND RAISED PAVEMENT MARKERS WHICH ARE EITHER BI-DIRECTIONAL TWO COLOR OR SINGLE REFLECTORS PLACED BACK TO BACK, WHICH REFLECT THE APPROPRIATE COLOR FOR THE TRAFFIC PATTERN, SHOULD BE USED TO DELINEATE EACH EDGE OF THE TRAVELED PATH THROUGH THE WORK AREA.
23. TEMPORARY CONCRETE BARRIER SHALL BE APPLIED AS PER THE CURRENT STANDARD PLAN.
24. VERTICAL PANELS SHALL BE USED IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER.

### SIGN DETAIL



#### COLORS

LEGEND AND BORDER - BLACK (NON-REFLECTORIZED)  
BACKGROUND - WHITE (REFLECTORIZED)



#### COLORS

STRIPES - ORANGE (REFLECTORIZED)  
AND WHITE (REFLECTORIZED)

### SIGN SIZES

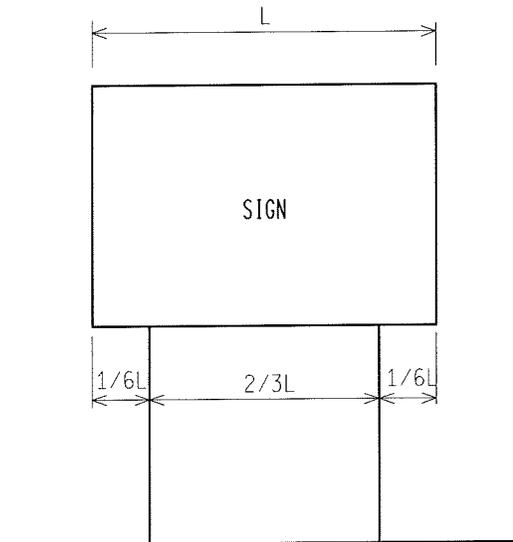
DIAMOND WARNING - 48" x 48"  
R2-1 REGULATORY - 48" x 60"  
R5-18c REGULATORY - 48" x 48"  
R10-6 REGULATORY - 36" x 54"  
VERTICAL PANEL - 12" x 36"

NOT TO SCALE

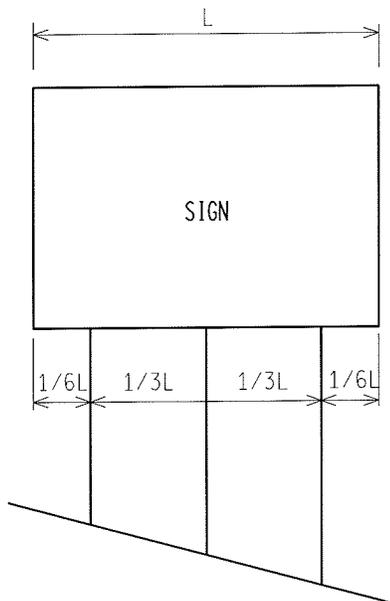
 <b>MDOT</b> Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TEMPORARY TRAFFIC SIGNAL, TWO-LANE TWO-WAY ROADWAY WITH SIGN PLACEMENT ON ONE SIDE OF ROADWAY NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf	OCTOBER 2011	M0180a	SHEET 2 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0180a.dgn REV. 10/10/2011			



## 2 POST SIGN SUPPORT SPACING



## 3 POST SIGN SUPPORT SPACING



\* FOR ALL 11' AND 12' LONG SIGNS ON 3 WOOD SUPPORTS, SPREAD POSTS SO AS TO HAVE A 8' MIN. TO 9' MAX. DISTANCE BETWEEN OUTSIDE POSTS.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

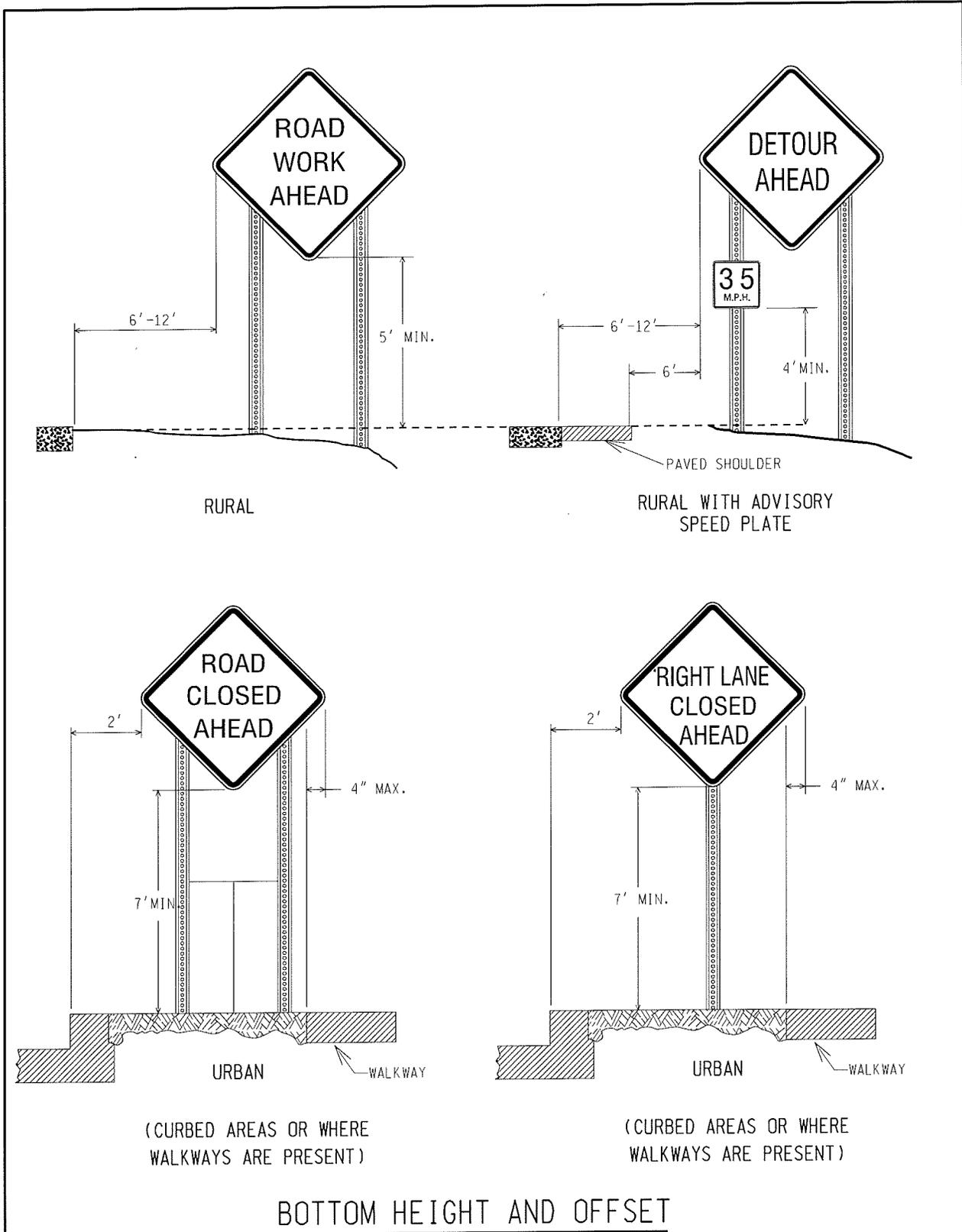
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11/2/2017  
PLAN DATE

WZD-100-A

SHEET  
2 OF 11

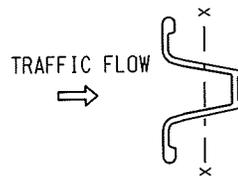
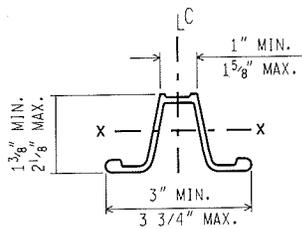
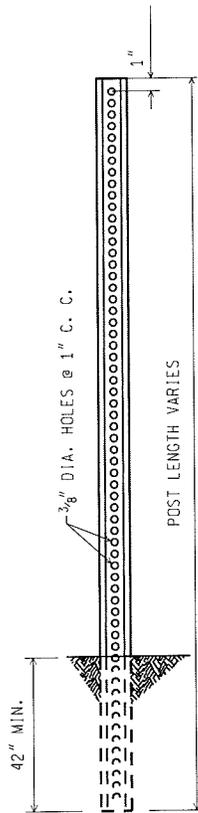
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MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 3 OF 11
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WEIGHT = 3 lbs/ft  
 SECT. MOD. X.-X. = 0.31 CUBIC INCHES MIN.

3 lb. U - CHANNEL STEEL POST  
 (NO SPLICE)

MOUNT SIGN ON OPEN FACE OF  
 U - CHANNEL STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN

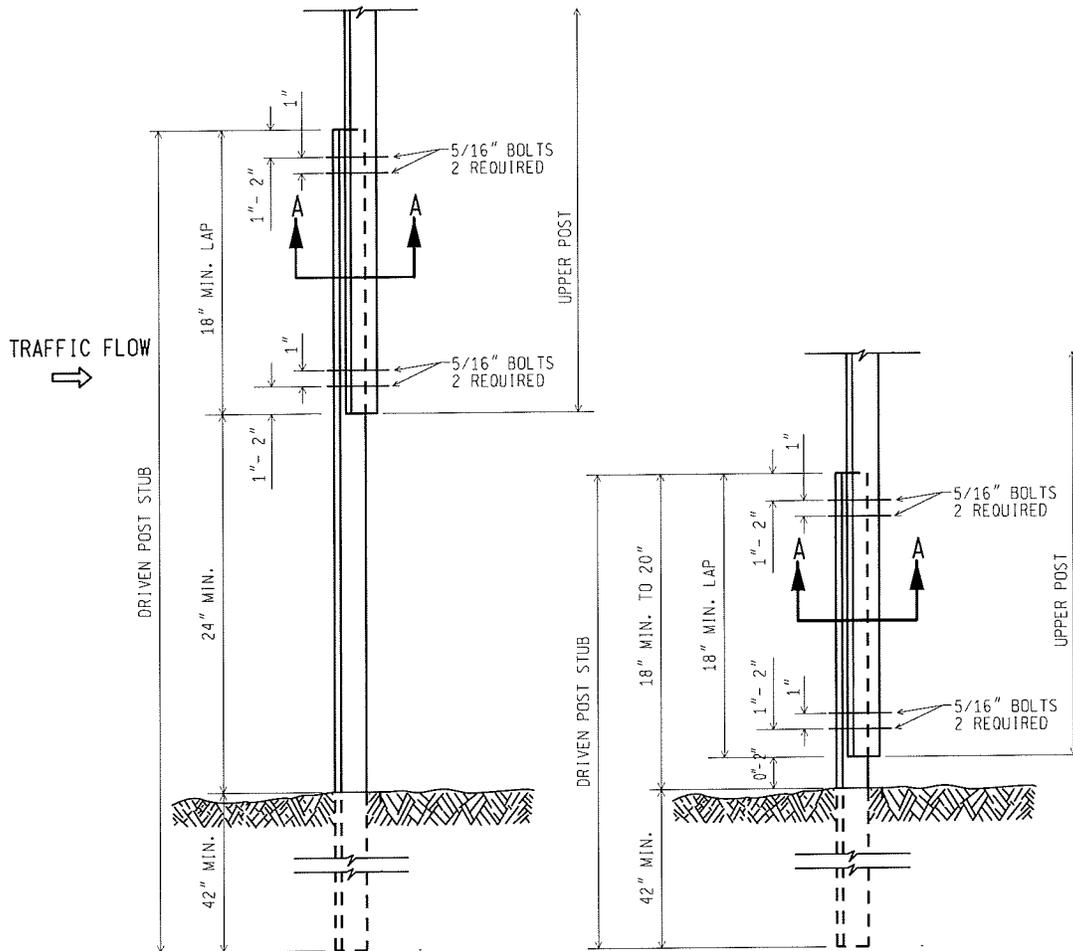
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11/2/2017  
 PLAN DATE

WZD-100-A

SHEET  
 4 OF 11

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3 lb. U - CHANNEL STEEL POST  
(WITH SPLICE)

MOUNT SIGN ON OPEN FACE OF  
UPPER U - CHANNEL STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

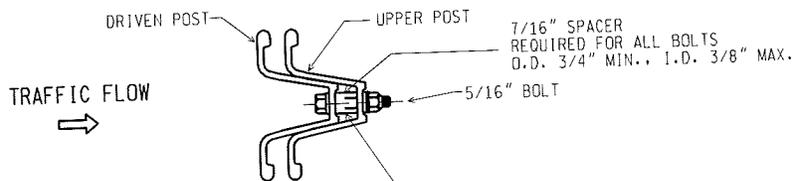
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11/2/2017  
PLAN DATE

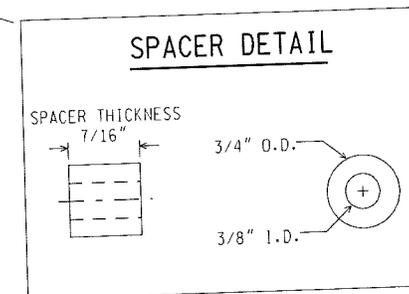
WZD-100-A

SHEET  
5 OF 11

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SECTION A-A



NOTES:

1. THE SPACER THICKNESS SHALL BE 1/16" LESS THAN THE GAP BETWEEN THE POST WHEN POSITIONED IN THE UNBOLTED CONFIGURATION.
2. THE EXTERIOR BOLT (CLOSEST TO LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN A PREPUNCHED HOLE 1" TO 2" FROM THE END OF THE LAP.
3. THE INTERIOR BOLT (FARTHEST FROM LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN THE NEXT PREPUNCHED HOLE.
4. THE DRIVEN POST SHALL ALWAYS BE MOUNTED IN FRONT OF THE UPPER POST WITH RESPECT TO THE ADJACENT ONCOMING TRAFFIC, REGARDLESS OF THE DIRECTION THE SIGN IS FACING.
5. THE SPLICE LAP SHALL BE FASTENED BY FOUR-5/16" DIA. GALVANIZED A449 BOLTS (SAE J429 GRADE 5) OR GALVANIZED A325 BOLTS.

3 lb. U - CHANNEL STEEL POST  
(WITH SPLICE)

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

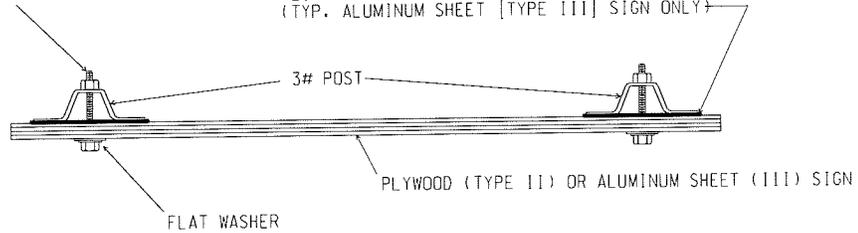
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SHEET  
6 OF 11

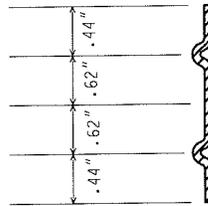
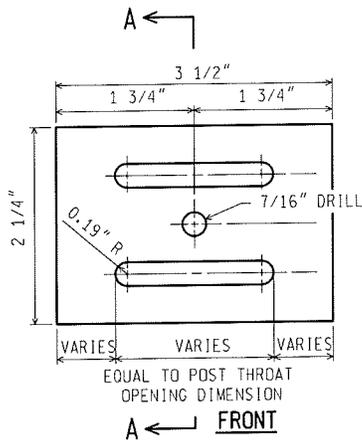
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

5/16" DIAMETER GALVANIZED BOLT AND NUT

SELF-ALIGNING STEEL REINFORCING PLATE (TYP. ALUMINUM SHEET [TYPE III] SIGN ONLY)



SIGN TO 3 lb. POST CONNECTION



SECTION A-A

NOTES: (FOR STEEL SIGN REINF' PLATE)

1. MATERIAL: 12 GAUGE CARBON STEEL.
2. TOLERANCE ON ALL DIMENSIONS  $\pm 0.0625$ "
3. FINISH—AFTER STAMPING AND PUNCHING, GALVANIZE ACCORDING TO CURRENT SPECIFICATIONS FOR ZINC (HOT GALVANIZE) COATINGS ON PRODUCTS FABRICATED FROM PLATES OR STRIPS

STEEL SIGN REINFORCING PLATE  
REQUIRED FOR TYPE III SIGNS ONLY

3 lb. U - CHANNEL STEEL POST SIGN CONNECTION

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

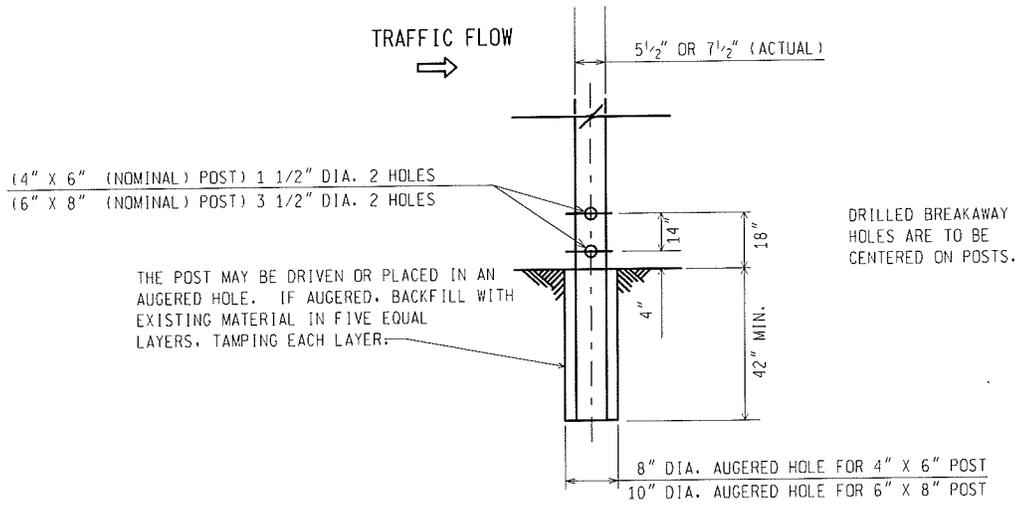
F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

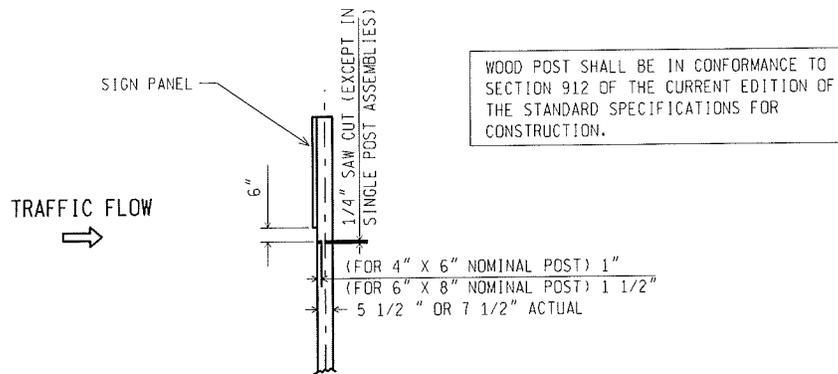
WZD-100-A

SHEET  
7 OF 11

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WOOD POST BREAKAWAY HOLES/  
 DIRECT EMBEDMENT DETAILS



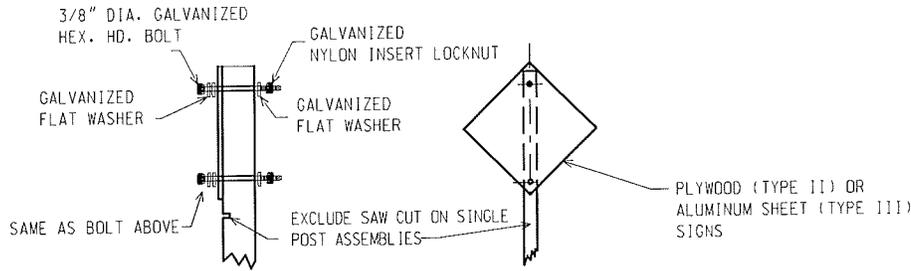
SAW CUT DETAIL  
 (MULTIPLE POST INSTALLATIONS)

WOOD POST DETAILS

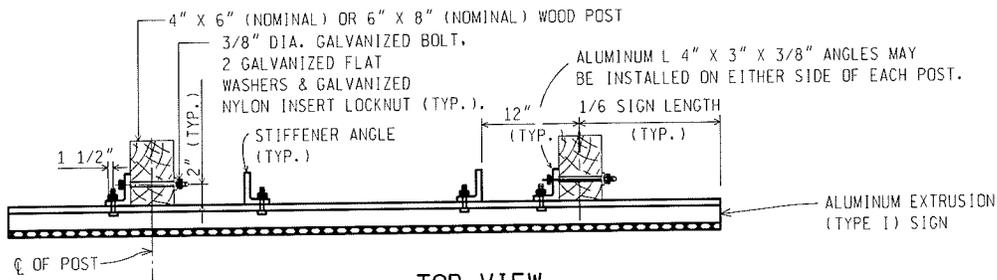
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 8 OF 11
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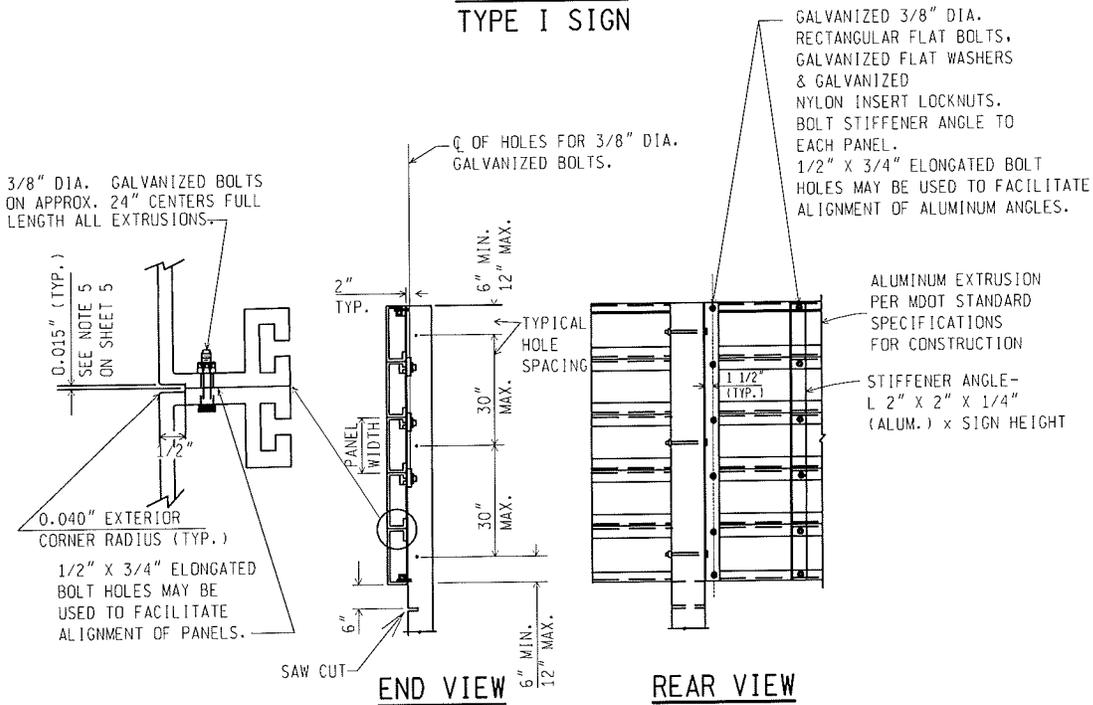
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**TYPE II AND TYPE III SIGNS**



**TOP VIEW  
TYPE I SIGN**



**TYPE I SIGN - ERECTION DETAILS**

**WOOD POST CONNECTIONS**

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN

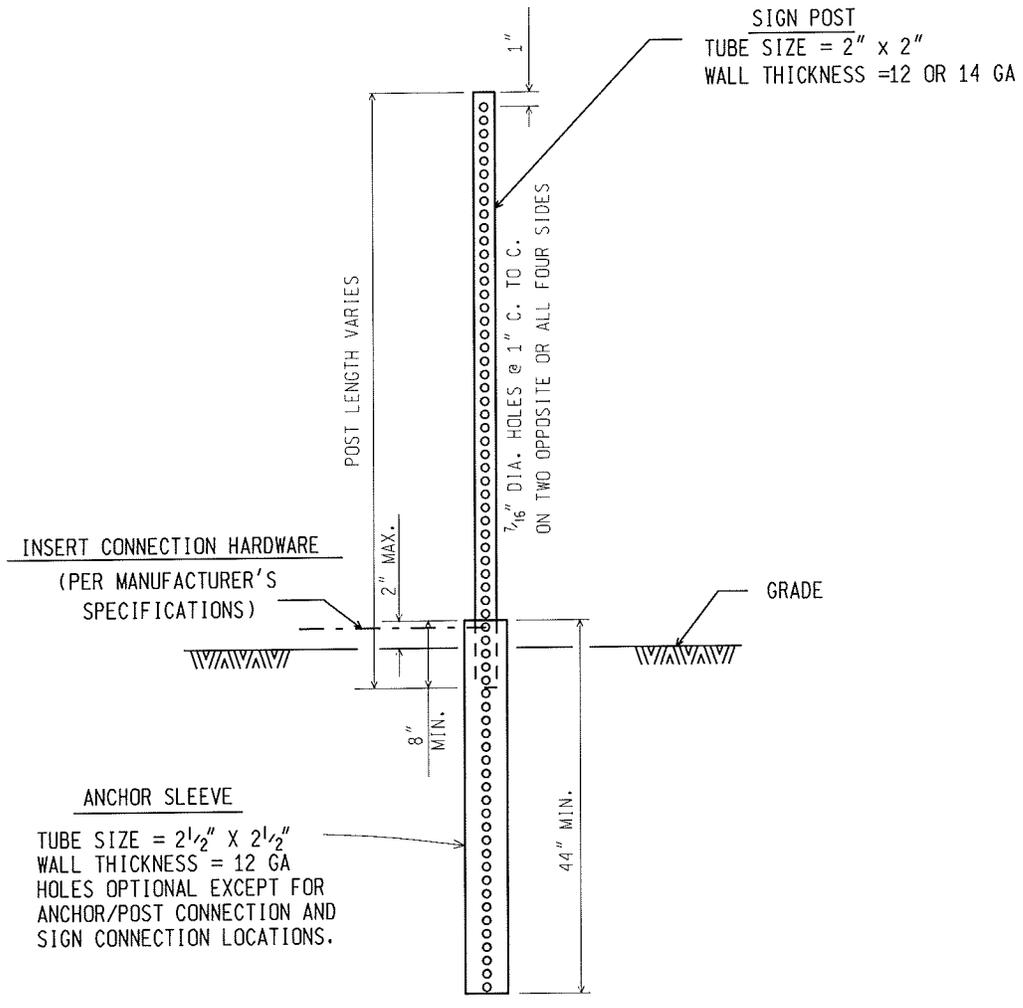
F.H.W.A. APPROVAL

11/2/2017  
PLAN DATE

WZD-100-A

SHEET  
9 OF 11

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



SQUARE TUBULAR STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 10 OF 11
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NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

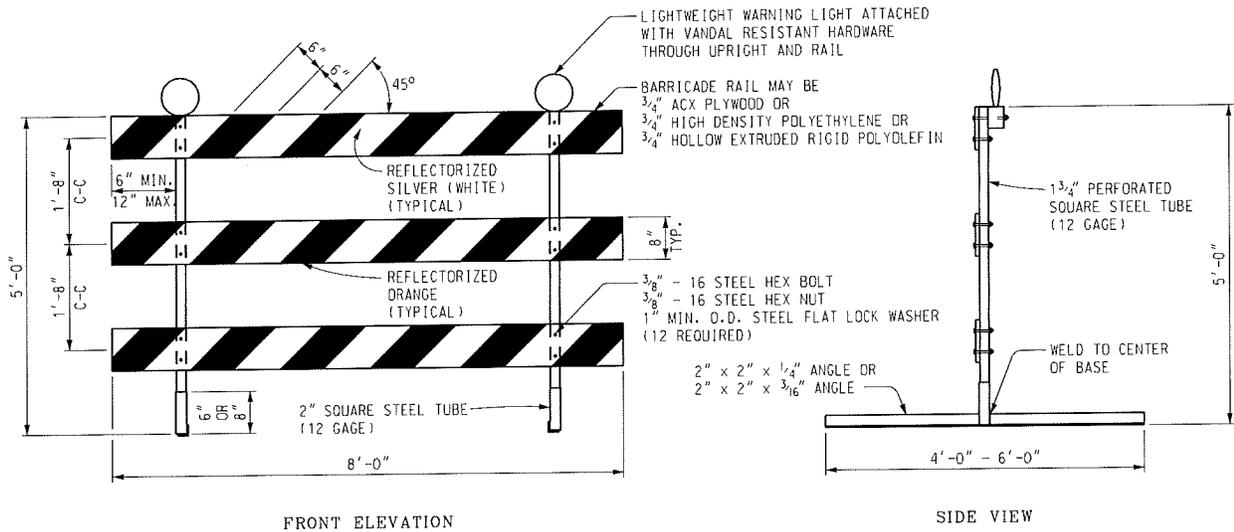
GENERAL NOTES:

1. A MAXIMUM OF TWO POSTS WITHIN A 7 FOOT PATH IS PERMITTED.
2. ALL SIGN POSTS SHALL COMPLY WITH NCHRP 350.
3. ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 42".
4. BRACING OF POST IS NOT PERMITTED.
5. SIGN SHALL BE LEVEL, AND UPRIGHT FOR THE DURATION OF INSTALLATION.
6. ERECT POSTS SO THE SIGN FACE AND SUPPORTS DO NOT VARY FROM PLUMB BY MORE THAN 3/16" IN 3'. PROVIDE A CENTER-TO-CENTER DISTANCE BETWEEN POSTS WITHIN 2 PERCENT OF PLAN DISTANCE.
7. NO MORE THAN ONE SPLICE PER POST, AS SHOWN, WILL BE PERMITTED.
8. POST TYPES SHALL NOT BE MIXED WITHIN A SIGN SUPPORT INSTALLATION.
9. NO VERTICAL JOINTS ARE PERMITTED IN SIGN. NO HORIZONTAL JOINTS THROUGH SIGN LEGEND OR SYMBOLS ARE PERMITTED IN SIGN
10. REMOVE SIGN POSTS AND/OR POST STUBS IN THEIR ENTIRETY WHEN NO LONGER REQUIRED.
11. ALL LABOR, MATERIALS, AND EQUIPMENT, INCLUDING TEMPORARY SUPPORTS REQUIRED TO INSTALL, MAINTAIN, RELOCATE, AND/OR REMOVE THE TEMPORARY SIGN, INCLUDING SUPPORTS, ARE CONSIDERED TO BE INCLUDED IN THE COST OF THE TEMPORARY SIGN.
12. SAW CUTS IN WOOD POSTS ARE TO BE PARALLEL TO THE BOTTOM OF THE SIGN.
13. POSTS SHALL NOT EXTEND MORE THAN 4" ABOVE TOP OF SIGN.
14. TEMPORARY WOOD SUPPORTS DO NOT REQUIRE PRESERVATIVE TREATMENT.

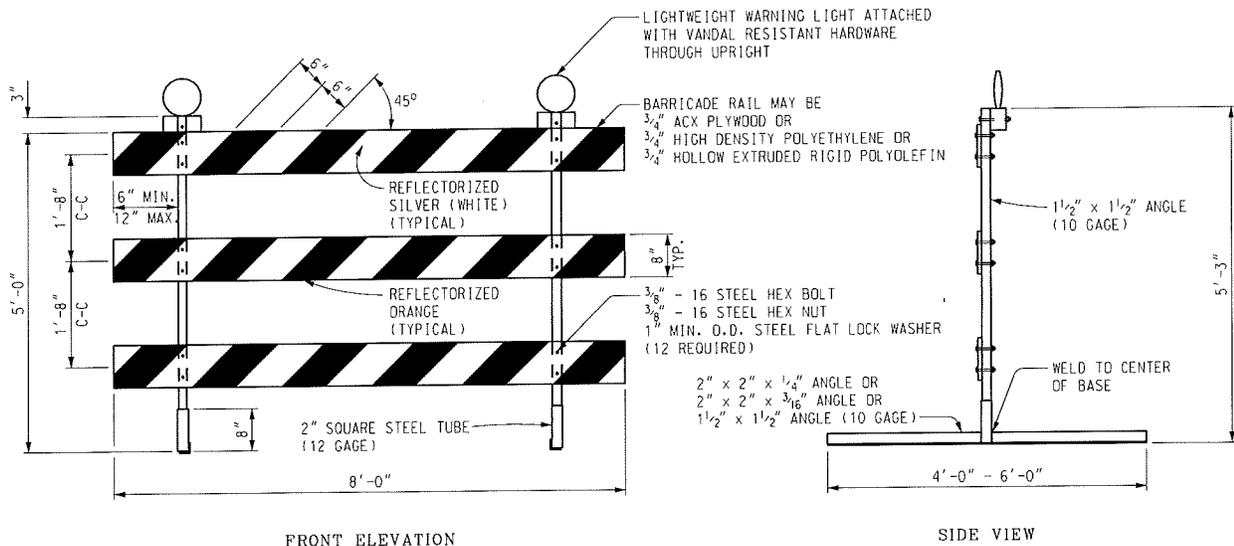
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN	F.H.W.A. APPROVAL	11/2/2017 PLAN DATE	WZD-100-A	SHEET 11 OF 11
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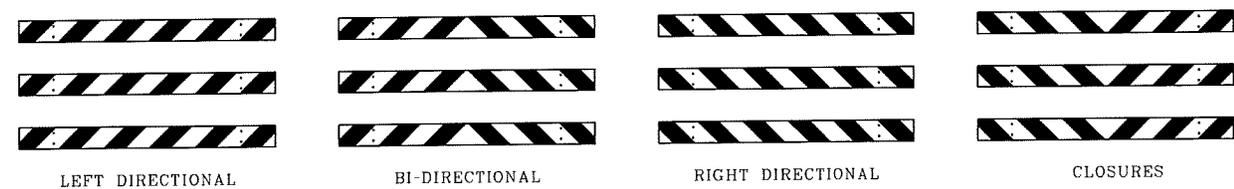
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



FRONT ELEVATION SIDE VIEW  
**PERFORATED SQUARE STEEL TUBE OPTION**



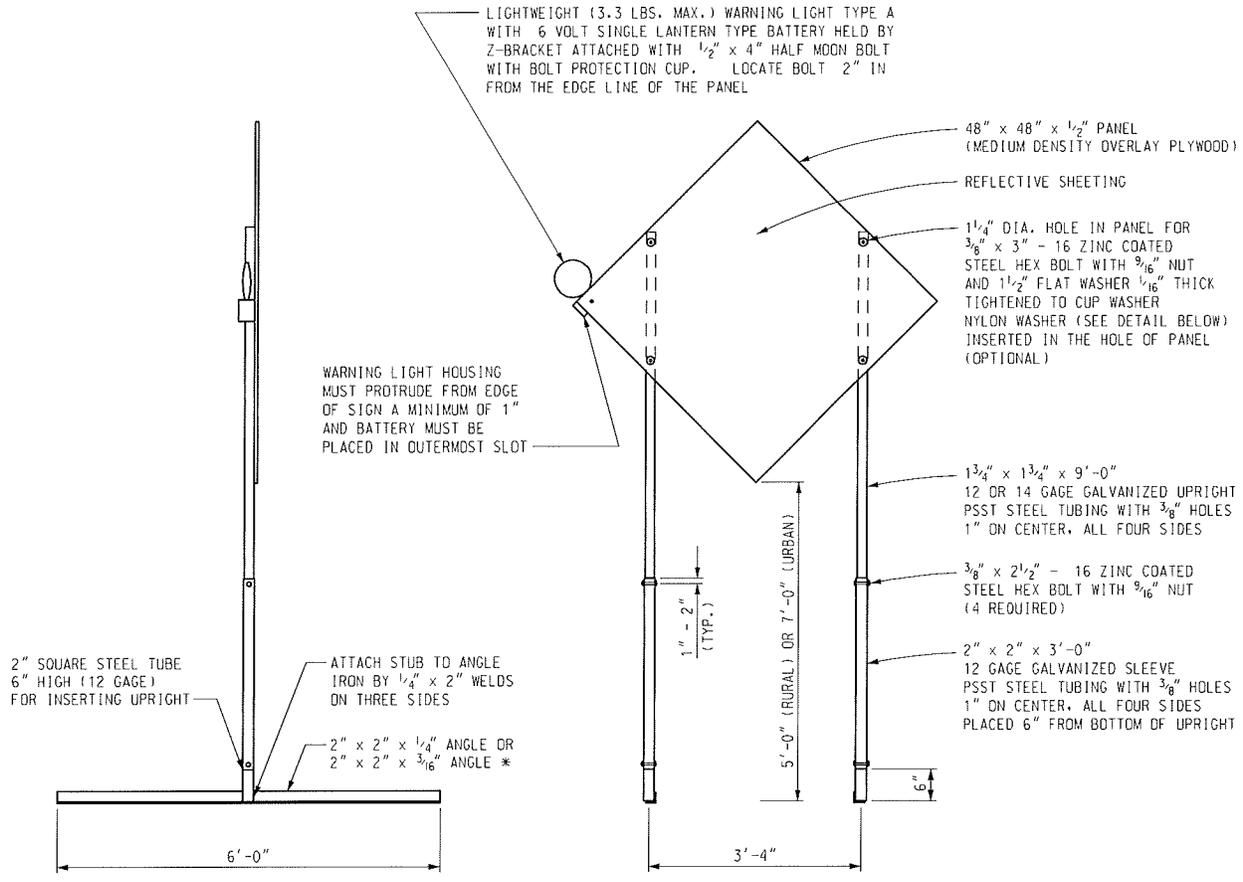
FRONT ELEVATION SIDE VIEW  
**ANGLE IRON OPTION**



**BARRICADE RAIL SHEETING OPTIONS  
 TYPE III BARRICADES**

Other Type III Barricades meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at [http://safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/wzd.htm](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm)

<p>PREPARED BY          DESIGN DIVISION</p> <p>DRAWN BY: <u>ECH</u></p> <p>CHECKED BY: <u>MWB</u></p>	DEPARTMENT DIRECTOR Kirk T. Steudle	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR			
	APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES ENGINEER OF DEVELOPMENT	Temporary Traffic Control Devices			
	APPROVED BY: _____ (SPECIAL DETAIL) DIRECTOR, BUREAU OF DEVELOPMENT	F.H.W.A. APPROVAL	<u>1/18/11</u> PLAN DATE	WZD-125-E	SHEET 1 OF 3



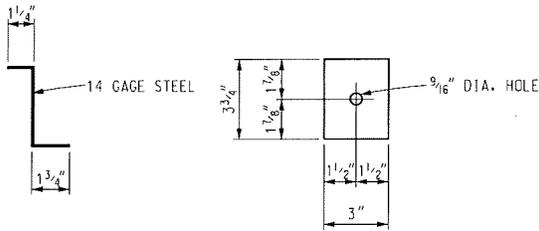
SIDE VIEW

FRONT ELEVATION

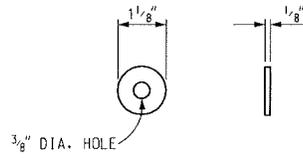
**TEMPORARY SIGN SUPPORT**

(WARNING LIGHT PLACED ON SIDE CLOSEST TO TRAFFIC)

\* SIGN STAND IS BALLASTED WITH FOUR OR MORE 35 LB SANDBAGS. A MINIMUM OF ONE ON EACH END. UPRIGHTS SHALL NOT EXTEND ABOVE THE SIGN PANEL.



Z-BRACKET DETAIL



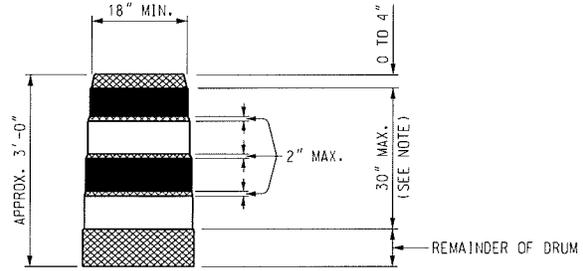
OPTIONAL NYLON WASHER

Other temporary sign supports meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at [http://safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/wzd.htm](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm)

NOT TO SCALE

- PLASTIC DRUM
- ▲▲▲ PROPOSED TYPE III BARRICADE
- △△△ EXISTING TYPE III BARRICADE

**SYMBOLS TO BE USED ON PLANS**



- REFLECTORIZED ORANGE
- REFLECTORIZED WHITE
- ▨ NON REFLECTORIZED ORANGE

NOTE:  
 DRUMS SHALL HAVE AT LEAST 4 HORIZONTAL REFLECTORIZED STRIPES (2 ORANGE AND 2 WHITE) OF 6" UNIFORM WIDTH, ALTERNATING IN COLOR WITH THE TOPMOST REFLECTORIZED STRIPE BEING ORANGE. NON REFLECTORIZED SPACES BETWEEN THE HORIZONTAL REFLECTORIZED ORANGE AND WHITE STRIPES SHALL BE ORANGE IN COLOR AND EQUAL IN WIDTH.

**PLASTIC DRUM**

NOTES:

2" PERFORATED SQUARE STEEL TUBES MAY BE USED TO FABRICATE THE HORIZONTAL BASE OF THE TYPE III BARRICADE.

WARNING LIGHTS SHALL BE PLACED ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ALL OTHER PROVISIONS IN THE CONTRACT ON TYPE III BARRICADES.

SEE ROAD STANDARD PLANS R-113-SERIES FOR TEMPORARY CROSSOVERS FOR DIVIDED ROADWAY, AND R-126-SERIES FOR TYPICAL LOCATION AND SPACING OF PLASTIC DRUMS FOR PLACEMENT OF TEMPORARY CONCRETE BARRIER.

SIGNS, BARRICADES, AND PLASTIC DRUMS SHALL BE FACED WITH PRESSURE-SENSITIVE REFLECTIVE SHEETING ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SANDBAGS SHALL BE USED WHEN SUPPLEMENTAL WEIGHTS ARE REQUIRED TO ACHIEVE STABILITY OF THE BARRICADE. THE SANDBAGS SHALL BE PLACED SO THEY WILL NOT COVER OR OBSTRUCT ANY REFLECTIVE PORTION OF THE TRAFFIC CONTROL DEVICE.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN

(SPECIAL DETAIL)  
 F.H.W.A. APPROVAL

1/18/11  
 PLAN DATE

WZD-125-E

SHEET  
 3 OF 3

MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
  
SPECIAL PROVISION  
FOR  
**VERTICAL EXPLORATORY INVESTIGATION**

SIG:EMS

1 of 2

APPR:DMG:NL:06-27-17  
FHWA:APPR:07-11-17

**a. Description.** The use of this special provision is to compensate the Contractor to locate underground infrastructure, such as culverts, sewers and utilities, and must only be used as directed and approved by the Engineer. This special provision is not to compensate the Contractor for the responsibilities in subsection 107.12 of the Standard Specifications for Construction.

This work consists of conducting a vertical exploratory investigation to expose an existing culvert, sewer or utility in order to verify the location, condition, size, material and/or alignment; allowing the Engineer to document the necessary information; and backfilling the excavation. This work includes providing necessary lane, shoulder and/or sidewalk closures required to perform work.

**b. Materials.** Use Granular Material Class III in accordance with section 902 of the Standard Specifications for Construction for backfill. Use material removed during exploratory investigation for backfill only if approved by of the Engineer.

**c. Construction.** The owner of any sewer or utility to be exposed will not take the facilities out of service during the exploratory investigation. Contact utility owners in accordance with subsection 107.12 of the Standard Specifications for Construction.

Establish necessary lane, shoulder and/or sidewalk closures required to perform work.

Advance the exploratory excavation using vacuum excavation, hand digging, conventional machine excavation, or a combination thereof subject to approval of the Engineer. Allow the Engineer access to document the necessary information. If the technique used to advance the excavation causes any damage to the existing facilities, immediately contact the utility owner and cease all work until an alternate method is approved by the Engineer.

Take care to protect the exposed culvert, sewer or utility from damage during construction. Repair or replace culvert, sewer or utility, damaged during exploratory excavation, in accordance with the standard specifications and as approved by the Engineer.

Obtain the Engineer's approval before backfilling the excavation. Complete backfilling no later than 24 hours after approval has been given. Backfill in accordance with subsection 204.03.C of the Standard Specifications for Construction. Dispose of excess material in accordance with the standard specifications.

The Contractor is responsible for all costs associated with the repair work and out of service time of all broken or damaged existing culverts, sewers or utilities as a result of any action by the Contractor. If the exploratory investigation results in damage to utilities, contact the owner of such utility to coordinate the repair.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Exploratory Investigation, Vertical.....	Foot

**Exploratory Investigation, Vertical** will be measured by the foot from top of existing grade vertically to the bottom of the excavation for a 4-foot maximum diameter hole, or as approved by the Engineer. The excavated depth of each 4-foot maximum diameter hole will be measured separately for payment.

**Exploratory Investigation, Vertical** includes all labor, equipment and materials required to complete the work, including all costs associated with repair or replacement resulting from the Contractor's activities.

CITY OF BATTLE CREEK

SPECIAL PROVISION  
FOR  
**RELOCATE BUSINESS SIGN**

OHM:mrl

1 of 1

06/15/18

**a. Description.**-This work shall be subject to the requirements, conditions, and specifications provided herein and shall include the furnishing of all labor, materials, tools, equipment, accessories and services necessary for relocating the items as shown on the Contract Drawings and/or as herein required. The work consists of removing, salvaging and reinstalling or reconstructing, the existing privately owned business sign to a location approved by the property owner.

**b. Construction Methods.**-The existing may be of wood, brick or metal construction. The contractor shall evaluate the existing sign and determine how much of the sign can be relocated and how much will have to be reconstructed. After the evaluation, the contractor shall submit a shop drawing for approval showing the suggested method of relocation/reconstruction. No work shall be complete prior to the approval of the shop drawing. The relocation of this existing sign is critical to clearing the proposed right-of-way so early submittal of the shop drawings is required. Sign may require a concrete foundation which will not be able to be salvaged and must be replaced at the new location.

**c. Materials.**- Concrete used for post stability (if required) may be a commercial bag mix as approved by the Engineer. Materials damaged by the Contractor shall be repaired or replaced by the Contractor as directed by the Engineer at no additional cost to the contract.

**d. Measurement and Payment.**-The completed work as measured for Relocate Business Sign will be paid for at the contract unit price for the following contract items (Pay Items).

**Contract Item (Pay Item)**

**Pay Unit**

Relocate Business Sign.....Each

Relocate Business Sign will be measured in place at each location and will be paid for by the each unit price for each relocation, which shall be payment in full for all labor, materials, and equipment needed to accomplish this work. Removal of any existing sign foundation as directed by the Engineer shall also be included in cost of the relocation.

**CITY OF BATTLE CREEK**  
**SPECIAL PROVISION**  
**FOR**  
**RELOCATION OF LIGHT POLE**

OHM:mrl

1 of 1

7/3/2018

**a. Description.** This work costs of relocation existing features on private property that are in conflict with the proposed work. Work shall be performed in accordance with the 2012 MDOT Standard Specifications for Construction, details shown on the plans, and this special provision.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction.

**Construction Methods.** Examine the site and notify the Engineer of any site conditions that may adversely affect the relocation of these items.

**Relocate Light Pole** shall consist of relocating existing light poles from their existing location to a designated spot as determined by the property owner or Engineer. The work includes removing the light poles from any existing foundation, chipping away any existing concrete attached to the pole, digging a foundation that matches the existing light pole bury depth, placing the pole in a concrete foundation of the same dimensions from what was removed (if previously set in concrete), and resetting the light pole plum to the exiting ground. All disposals from this work are included in this work. Existing wiring may be reused if relocations are in the vicinity of the previous location, however no wire splicing is allowed. If new wiring is required, the work of placing it in conduit is included in the cost of the light relocation.

**c. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Relocate Light Pole .....	Each

All relocation items will be paid by the Each, for each item relocated and shall include all materials, labor, and equipment necessary to complete the work as described in this specification.

CITY OF BATTLE CREEK

SPECIAL PROVISION  
FOR  
**SUBGRADE UNDERCUTTING, TYPE II, MODIFIED**

OHM/mrl

1 of 1

06/15/18

**a. Description.** This work shall be done in accordance with Section 205, Roadway Earthwork, of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction except as modified herein.

**b. Materials.** The backfill material for Subgrade Undercutting, Type II, Modified shall be 21AA aggregate and shall meet the requirements for Dense-Graded Aggregates specified in Section 902 of the MDOT 2012 Standard Specifications for Construction with the aggregate material being 21AA as per the specifications for, Aggregate Base Course.

**c. Construction Methods.** Subgrade Undercutting, Type II, Modified shall be performed on poor subgrade soils beneath the proposed aggregate base, as deemed necessary by the Engineer. This work shall be done in accordance with Section 205 of the MDOT 2012 Standard Specifications for Construction.

**d. Measurement and Payment.** The completed work for Subgrade Undercutting, Type II, Modified will be paid for at the contract unit price for the following contract item (pay item):

<u>Pay Item</u>	<u>Pay Unit</u>
Subgrade Undercutting, Type II, Modified.....	Cubic Yard

**Subgrade Undercutting, Type II, Modified** will be measured in its original position by the unit cubic yard and paid for at the contract unit price per cubic yard, which price shall be payment in full for all labor, materials, and equipment needed to accomplish this work. Payment for this contract item includes removal and disposal of undesirable material and replacement with the type of material specified.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
TEMPORARY PORTABLE DRIVE WAY ASSISTANCE DEVICE FOR JOB NUMBER  
123168

COL:JS

1 of 2

APPR:XXX:YYY:00-00-00

**a. Description.** This work consists of furnishing, installing, operating, maintaining, relocating, and removing a driveway assistance device as identified in the proposal or on the plans. Use temporary driveway assistance devices to control low volume traffic entering a one-lane two-way road, from local streets or driveways. Driveway assistance devices must be used with a signal system having a minimum of two temporary or portable signals as detailed on the plans.

**b. Materials.** Provide a temporary driveway assistance device that meets the following requirements:

1. The driveway assistance device is a self-contained mobile unit with a small footprint. This includes a single vertical mast that supports a single signal head. The body of the unit can be a trailer to be moved by a vehicle, or a cart designed to be moved by an individual.

2. Ensure the electrical power source for the signal unit is self-contained, allows for continuous operation while deployed, and may consist of one or a combination of:

A. On board batteries, secured to prevent theft.

B. Solar panels attached to the signal unit.

C. An internal or external generator used to charge the batteries.

3. Ensure the driveway assistance device is equipped with one signal head containing one 12 inch diameter, red circular light emitting diode (LED) indication, with two 8 inch diameter red arrow LED indications mounted on either side of the red circular indication. Ensure the driveway assistance device is operated by a solid state controller with a maximum of three driveway assistance devices being controlled by a single controller.

4. Ensure all signals on the project maintain communication at all times. This may be facilitated through wireless radio communications, or hardware cable communications. Acceptable driveway assistance devices must be configured to facilitate both wireless radio and hardwired remote control devices are all acceptable components.

5. Upon a signal system fault, the driveway assistance device must display a solid red indication until that signal is removed from service or the error is corrected and the program restarted. The default setting for portable or temporary signals within the system is at the direction of the Engineer.

6. Provide a remote monitoring system that is capable of reporting signal location, battery voltage/battery history and system default on all devices that are appropriately equipped. The monitoring system must include a password-protected web site viewable from any computer with internet capability. In the event of a system fault, the monitoring system must provide specific information concerning the cause of the system fault (i.e...red lamp on signal number 1). The monitoring system must provide a notification via text messaging and/or email upon a fault. Ensure the running program operating the temporary signal system is available and viewable through the monitoring system website at all times.

**c. Construction.** Equip the driveway assistance devices as directed by the Engineer and install the signal at the locations provided in the contract.

1. Prior to installation, the Contractor must provide written notification to all residences and businesses whose drives will be controlled by a driveway assistance device. This notification includes anticipated dates of operation and instructions to safely interact with the signal.

2. Locate the signal opposite the road or driveway to be controlled, ensure the indications are clearly visible to approaching traffic. Avoid placing the signal on non-motorized facilities or in active work areas.

3. Extend the mast so the signal head is positioned a minimum of 9 feet above the road surface. Ensure the signal head is leveled to provide a maximum visibility for vehicles in the queue. Verify all signals are functioning properly before closing any lanes.

4. Ensure the driveway assistance devices operate continuously throughout the life of the contract. This includes maintaining adequate electrical power according to the manufacturer's recommendations. Ensure faults in the driveway assistance device are corrected promptly, and may necessitate replacing the unit. If the unit must be replaced due to an equipment defect, a replacement unit must be provided at no additional cost.

5. Do not attach any signage to the signal mast. Any information signage needed in conjunction with the driveway assistance device must be posted adjacent to the signal and conform to all applicable temporary sign construction requirements. These signs, if included in the contract, will be paid for as Sign, Type \_\_, Temp, Prismatic, Furn, and Sign, Type \_\_, Temp, Prismatic, Oper.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Driveway Assistance Device, Portable, Temporary.....	Each

**Driveway Assistance Device, Portable, Temporary** includes all labor, equipment, and materials needed to install, continuously operate, reconfigure, remotely monitor and support, relocate, repair, replace, and remove one signal unit throughout the life of the contract.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
  
SPECIAL PROVISION  
FOR  
TRAFFIC CONTROL QUALITY AND COMPLIANCE

OPR:JJG

1 of 2

APPR:CER:DBP:01-20-11

FHWA:APPR:06-20-11

**Delete the subsection 812.03.C, Deficient Traffic Control Operations on page 601 of the Standard Specifications for Construction in its entirety, and replace with the following.**

**C. Deficient Traffic Control Operations.**

1. **Traffic Control Quality and Compliance.** The following applies to all aspects of the traffic control plan and traffic control devices except the Type D lights on plastic drums which are covered elsewhere in the contract.

a. **Traffic Control not Anticipated in Design.** If at any time during the project, including the time during the seasonal suspension, the Engineer documents that the traffic control requires improvements beyond the scope of the Traffic Control Plan, the Engineer will provide written instructions to the Contractor and traffic control supplier what improvements are required. The Contractor must develop and submit to the Engineer for approval, a written implementation schedule for improvements. If the schedule is not approved, or if the schedule is approved but is not followed, the Department will adjust the contract according to subsection 812.03.C.1.c.iii. If the implementation schedule is not followed, the Engineer will notify the Contractor and traffic control supplier in writing that they are in violation of this subsection. The work of making traffic control improvements directed by the Engineer that are beyond the scope of the Traffic Control Plan will be paid for as extra work.

b. **As Designed Traffic Control.** If at any time during the project, including the time during the seasonal suspension, the Engineer documents that the traffic control is deficient, inadequate or improperly placed, the Engineer will provide written notification with instructions for corrective action to the Contractor and traffic control supplier. Upon receipt of the notification of corrective action, the Contractor has 4 hours to correct the traffic control. If the traffic control cannot be corrected within the 4 hour time period, the Contractor will develop a written implementation schedule for the corrective action and submit the schedule to the Engineer for approval within 1 hour of receiving the written notification. If the schedule is not approved, or if the schedule is approved but is not followed, the Department will adjust the contract according to subsection 812.03.C.1.c.iii. If the implementation schedule is not followed, the Engineer will notify the Contractor and traffic control supplier in writing that they are in violation of this subsection.

c. **Corrective Action.** The Engineer will give written notification to the Contractor as identified above. Failure to make corrections within the timeframe required may result in the following actions by the Engineer:

- i. Stop work on the project until the Contractor completes corrective action,
- ii. Order corrective action by others in accordance with subsection 107.07, subsection 108.02, subsection 812.03.B, and in the interest of public safety.
- iii. A contract price adjustment will be made in the amount of \$100 per hour for every hour or portion thereof the improvements or corrective action remains incomplete as described herein. If improvements or corrections have not been made to the satisfaction of the Department, the contract will be adjusted until the traffic control is acceptable.

CITY OF BATTLE CREEK  
SPECIAL PROVISION  
FOR  
BOULDER, RELOCATE

OHM:TEG

1 of 1

06-15-18

**a. Description.** This work consists of removing large (>2-foot diameter) decorative boulders at the locations noted on the plans, storing on the project site in safe location (if owner wants materials) and relocating the boulders as directed by the Engineer, or disposing of the boulders.

**b. Materials.** None specified

**c. Construction.** Use equipment of the appropriate size to safely lift and transport the boulder to designated location. Lift and place the boulder using nylon straps or similar lifting supports to evenly support the boulder and prevent damaging the surface of the boulder.

Use care when relocating the boulder to prevent scratching or gouging the surface of the boulder. Boulders that are observed as significantly cracked or damaged during relocation must be removed from the project site and replaced by the Contractor at no expense to the Department.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Boulder, Relocate.....	Each

CITY OF BATTLE CREEK  
SPECIAL PROVISION  
FOR  
MODULAR BLOCK WALL

OHM:ALH

1 of 2

07-09-18

**a. Description.** Construct a gravity modular block wall to the line and elevations shown on the plans. Provide shop drawings prepared and stamped by a Professional Engineer licensed in the State of Michigan to the Engineer. Allow 3 weeks for review of the shop drawings. No work can begin on the gravity modular block walls prior to approval of the shop drawings. This work includes topsoil stripping and excavating as required; preparing a leveling pad or base; erecting the wall; placing backfill for the wall. Complete this work according to the standard specifications, details shown on the plans, the manufacturer’s recommended wall system installation procedures and this special provision.

Design the modular block walls in accordance with the AASHTO Bridge Design Specifications.

Provide the manufacturer’s recommended installation procedure and a sample of the color and texture to the Engineer for approval at the preconstruction meeting. The natural gray block color is desired.

**b. Materials.** Use material meeting the following:

Leveling Pad

Coarse aggregate 6 A (minimum 80 percent crushed) or Granular Material Class II..... 902

Backfill

Open graded aggregate 34 R or Granular Material Class II ..... 902

Non-woven geotextile separator ..... 910

Modular Blocks (wall and cap)

Provide modular blocks with the color and texture approved by the Engineer that conform to ASTM C 1372 for normal weight classification and the following:

1. Minimum 28 day compressive strength of the blocks must be 4000 psi and have 5 to 8 percent entrained air.
2. The maximum average loss on five specimens must not exceed one percent.
3. The modular block must have the nominal dimensions as shown on the plans unless approved by the Engineer.
4. Color must be uniform throughout the wall.
5. Furnish modular block by the manufacturer’s listed below or an approved equal:

**RediRock**  
 Grand Rapids Gravel  
 2700 28<sup>th</sup> Street, SW  
 PO Box 9160  
 Grand Rapids, MI 49509  
 Contact: Dennis Drier  
 Phone: 616-538-9000

**Stone Strong System**  
 Mack Industries  
 8265 White Lake Rd  
 White Lake, MI 48386  
 Phone: 248-620-7400

**Recon Retaining Wall Systems**  
 RA Bright Construction Inc  
 23808 West Andrew Rd  
 Plainfield, IL 60585  
 Contact: Steve Warner  
 Phone: 815-439-5760

Protect blocks from damage, chipping and soiling during delivery and storage. Store blocks off the ground on pallets or wood platforms. Do not use blocks with chips, cracks, voids, discoloration or other visible defects.

Provide manufacturer's test data certification, according to the Materials Quality Assurance Procedures Manual, documenting that the blocks meet these specifications and ASTM C 1372.

**c. Construction.** Erect the wall according to the details shown on the plans, manufacturer's recommendations and the following.

1. Excavate to the lines and grades shown on the plans, or as directed by the Engineer, for construction of the leveling pad. Prior to placing the leveling pad, the Engineer will determine the suitability of the in-situ soil. Excavate unsuitable soils to the limits determined by the Engineer and backfill per section 206 of the Standard Specifications for Construction. Compact the leveling pad or base to provide a level firm surface as directed by the Engineer on which to place the first course of blocks.

2. Place the first course of blocks in full contact with the prepared leveling pad and according to the manufacturer's instructions. Construct each layer to grade for the entire length of the wall. If any layer deviates from the grade more than 1 inch per 10 feet, remove the entire layer and reinstall. All costs associated with this removal and reinstallation will be borne by the Contractor.

3. At the angled corner of the wall, place geotextile separator against the blocks, fill the void area with aggregate of same type as leveling pad and wrap the geotextile around the aggregate prior to backfilling the wall.

4. Place the foundation underdrain as shown on the plans and as directed by the Engineer prior to backfilling the modular block wall.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Modular Block Wall .....	Square Foot

**Modular Block Wall** will be measured in place, in square feet of wall face, from the top of the leveling pad to the top of the wall cap.

**Modular Block Wall** includes foundation underdrain installation and furnishing all labor, materials, and equipment necessary to complete the work as described except for excavation of unsuitable soils and backfill of that excavation will be paid for separately.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
  
SPECIAL PROVISION  
FOR  
**TURF ESTABLISHMENT, PERFORMANCE**

DES:JLB

1 of 5

APPR:DMG:LML:01-13-15

**a. Description.** For the work identified in this special provision paid for by the pay item Turf Establishment, Performance only, delete section 816 of the Standard Specifications for Construction and replace it with this special provision. The Contractor is responsible for the performance and quality of turf growth in the areas indicated on the plans and as identified by the Engineer. Comply with all local, state and federal laws when completing this work.

Establish a durable, permanent, weed-free, mature, perennial turf. The work consists of fundamental turf work, including but not limited to topsoiling, seeding, mulching, erosion control, maintenance, watering and repair of turf as described herein during the life of the contract and during the life of any supplemental performance bond which may ensue.

Choose and implement proven turf establishment industry practices; provide all necessary labor and equipment; select and provide all turf establishment materials; and control erosion and any subsequent sedimentation at all times.

Perform a site analysis, interpret the results and implement a turf establishment program to ensure compliance with this specification. The site analysis must take into consideration topsoil needs, fertilizer and pH requirements, seed mix, existing and future soil moisture levels, slopes and grades, required erosion control items and devices, maintenance requirements, local highway snow removal and deicing practices, and any other characteristics that influence and affect turf establishment.

Subsection 107.11 of the Standard Specifications for Construction is revised relative to the Contractor's responsibility for the repair of turf establishment work as follows. The Contractor is responsible, at no additional cost to the contract, for the repair of turf establishment work occasioned by storm events up to 3 inches of rain in a 24 hour period as documented by local meteorological data submitted to the Engineer for review and approval. All other portions of subsection 107.11 remain unchanged.

1. Contractor Turf Establishment Experience Requirements. Ensure weed control is done by a commercial herbicide applicator, licensed by the State of Michigan and certified by the Michigan Department of Agriculture (MDA) in the appropriate category to apply herbicides. Use application procedures and materials according to federal, state and local regulations. Use of restricted use chemicals is prohibited. Provide appropriate documentation and secure approval from the Engineer before application of herbicides.

At least 10 work days prior to start of turf establishment, provide documentation to the Engineer, from the Contractor performing the turf establishment work, that they meet one or both of the following requirements.

A. At least one person employed by the Contractor performing the turf establishment work and assigned to the job site has a degree or certificate in Turf

Management, Horticulture or related field.

B. At least one person employed by the Contractor performing the turf establishment work and assigned to the job site has at least 5 years of experience in roadside turf establishment.

**b. Materials.** Provide topsoil, seed, mulch, pesticide, herbicide, mulch blankets and any other unique erosion control materials as necessary to fulfill this specification, as detailed on the plans. Use additional materials, as necessary, to meet the standards set forth for turf establishment in this special provision. The use of sod on the project requires the prior approval of the Engineer and if approved, may be used at limited site locations only.

Selection of all materials is the responsibility of the Contractor with the following minimum conditions.

1. Soil. Provide furnished or salvaged topsoil, which may be blended compost, that will support vigorous growth. Ensure topsoil is humus bearing and placed at least 4 inches deep. Ensure it is free of stones larger than 1/2 inch (2 inches on freeway projects) in diameter and other debris. Trim and grade the finished slope in accordance with subsection 205.03.N of the Standard Specifications for Construction.

2. Seed. Use a seeding mixture that is composed of four or more species of perennial grass. Use only species and their cultivars or varieties which are guaranteed hardy for Michigan.

Recommended species of perennial grasses include: Kentucky Bluegrass, Perennial Ryegrass, Hard Fescue, Creeping Red Fescue, Chewings Fescue, Turf-type Tall Fescue, Buffalo grass, and Alkaligrass-Fults Puccinellia distans. Select cultivars or varieties of grasses that are disease and insect resistant and of good color. Ensure that no one species in the mix is less than 5 percent, or more than 25 percent, of the mixture by weight. Do not select grass species considered noxious or objectionable, such as Quack Grass, Smooth Brome, Orchard Grass, Reed Canary Grass and others.

A. Ensure the seed is legally saleable in Michigan. Ensure the seed product does not contain more than 10 percent inert materials. Ensure the seed source is an MDOT approved certified vender.

B. Adapt the species and varieties of seed to the site conditions, to the site use, and to the soils, moisture and local climate. Site use may include, but is not limited to, detention pond, wildlife habitat, playground, wetlands, forested wetland, rural roadside, urban roadside and highly maintained front yard.

C. Ensure at least two of the species in the mixture proposed to be planted within 15 feet behind the curb or the shoulder are salt tolerant.

3. Mulch. Mulch seeded areas with the appropriate materials for the site conditions to promote germination and growth of seed and to mitigate soil erosion and sedimentation.

4. Herbicides. Comply with all federal, state and local laws. As part of the MDA weed control application, the Contractor is required to make proper notifications and/or postings as per label and MDA requirements for all locations that will be sprayed. Notify the Engineer at least 48 hours prior to any applications being made. Furnish and apply herbicide(s) as

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needed. It is the Contractor's responsibility to select the herbicide(s) and the rate at which it is used. Obtain the Engineer's approval of work methods and herbicide(s) selected prior to the application of the herbicide(s). Complete a spray log and submit to the Engineer each day an application is made.

Do not draw water from any waterway (i.e. river, ditch, creek, lake etc.) located on state, county or municipal right-of-way, for mixing with herbicides.

5. Fertilizers. Furnish and apply fertilizer(s) as needed. It is the Contractor's responsibility to select the fertilizer(s) and the rate at which it is used. Phosphorus is allowed for use only at the time of planting and when required by soil conditions. Obtain the Engineer's approval of work methods and fertilizer(s) prior to the application of the fertilizer(s).

6. Water. Furnish and apply water from an approved source at a rate to promote healthy growth.

**c. Construction.** The Contractor is responsible for all work and all construction methods used in completing this work. Implementation of any part of the standard specifications or standard plans by the Contractor does not relieve the Contractor of responsibility for acceptability of the construction methods or for the quality of the work.

1. Inspection of the Work. The Contractor is responsible for all inspection of turf establishment work.

Use a Contractor's Daily Report, approved by the Engineer, to report inspections made and to document turf establishment work performed on this project. Complete and submit a Contractor's Daily Report to the Engineer when any work performed under this special provision is in progress.

Include all necessary materials documentation including tests slips, certifications, etc. with the associated Contractor's Daily Report.

The Engineer will determine the acceptability of the Contractor's Daily Report in terms of their completeness and accuracy. The Engineer reserves the right to verify all submitted measurements and computations. Failure by the Contractor to submit acceptable and timely reports to the Engineer may result in withholding of progress pay estimates on turf-related items until such time as reports are submitted and deemed acceptable.

The Engineer reserves the right to inspect the project for any reason in accordance with subsection 104.01 of the Standard Specifications for Construction, including the fulfillment of other inspection requirements such as Soil Erosion and Sedimentation Control, NPDES, etc. Inspections made by the Engineer do not relieve the Contractor of the responsibility for inspections required by this special provision or the Contractor's responsibilities for erosion control and turf establishment.

2. Erosion Control. Control erosion at all times according to section 208 of the Standard Specifications for Construction. Control of soil erosion is the responsibility of the Contractor. However, sedimentation controls must be placed as indicated on the plans or as directed by the Engineer. Continuously monitor the site for needed erosion repair from any cause as addressed in the contract. Return all eroded areas to original grade as detailed in the contract.

Take immediate corrective action if sedimentation occurs in drainage structures or any watercourse or water containment area and stabilize all disturbed areas contributing to this sedimentation within 24 hours after the erosion occurrence. Remove sediment deposited as a result of the Contractor's inability to control the soil erosion at the Contractor's expense.

Reimburse the Department for any costs levied against the Department, such as fines, environmental costs, costs for remedies required, or any other costs as a result of the Contractor's failure to comply with this special provision and with federal, state and local laws.

3. Erosion Repair. The Contractor is responsible for all repairs and liable for all consequences (legal, monetary or other) associated with erosion or sedimentation damage to finished or unfinished work.

Report all erosion occurrences and the repairs made by the Contractor to the Engineer in the format and at the frequency required by the Engineer. Repair any erosion, displacement or disturbance to ongoing or completed work by any cause at no additional cost to the contract unless otherwise noted herein.

The Contractor is responsible and liable for all traffic control and safety measures required to repair and protect damaged turf areas. Repair any eroded area that may affect the support of the roadbed or safety of the public within 24 hours of the erosion occurrence.

Place protective devices such as barriers, directional signs/signals, temporary fence, or any other safety measures immediately after any erosion damage occurs that has the potential of endangering the public. In these instances, provide the Engineer with a written summary of the immediate action taken describing the repairs made and the safety measures taken, within 24 hours of the occurrence of the damage.

4. Mowing and Weeding. Maintain turf to a visually appealing level, and not more than 8 inches in height at any time, prior to acceptance. Weeds must be controlled to less than 10 percent of the turf establishment area at all times during construction.

5. Final Acceptance and Supplemental Performance Bond.

A. Final Acceptance Parameters. Ensure before final acceptance of the turf establishment work, all of the following minimum parameters are met throughout all exposed areas of the project designated on the plans or identified by the Engineer as turf establishment areas: there must be no exposed bare soil and the turf must be fully germinated, erosion free, weed free, disease free, dark green in color and in a vigorous growing condition.

The Engineer will notify the Contractor of the dates and times of all acceptance inspections. The Contractor may accompany the Engineer during these inspections. If the Contractor does not agree with the decision made by the Engineer, the Contractor may request an inspection by a mutually agreed upon third party (Michigan State University Extension service or other). A joint inspection, to include the Engineer, the Contractor, and the third party, will be scheduled by the Engineer. Pay all expert fees and expenses charged by the third party.

B. Supplemental Performance Bond. In the event that all contract items of work are

completed, including the placement of all turf establishment items of work, and the final acceptance of the project is delayed because the final acceptance parameters for the turf establishment work have not been fully met; the Contractor may propose to the Engineer the use of a supplemental performance bond.

The bond serves to secure the successful completion of turf establishment work and fulfillment of all final acceptance parameters for the turf establishment work. Ensure the supplemental performance bond, in all respects, is satisfactory and acceptable to the Department and executed by a surety company authorized to do business with the State of Michigan.

Ensure the bond is in an amount equal to 50 percent of the turf establishment work items covered by this special provision. Ensure the bond remains in place for two growing seasons. At the discretion of the Engineer, the bond may be reduced on a prorated basis as portions of the areas designated for turf establishment on the project meet the final acceptance parameters.

Prior to commencement of any work necessary to meet the acceptance parameters during the bonded period, the Contractor must apply for a permit to work within MDOT right-of-way using Form 2205. The permit fee and an individual permit performance bond will not be required. The permit insurance requirements, however, will be required.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Turf Establishment, Performance.....	Square Yard

**Turf Establishment, Performance** will include all labor, equipment and materials required or selected by the Contractor to install, maintain, inspect, repair and meet the acceptance parameters for turf establishment specified in this special provision, including preparation, updating and submittal of the Contractor's Daily Reports.

Repairs made to damaged turf establishment areas as a result of a documented storm by local meteorological data resulting in rainfall amounts of more than 3 inches in a 24 hour period will be paid for as an increase to original quantities in accordance with subsection 109.05 of the Standard Specifications for Construction.

The following schedule of payment applies to work performed according to this special provision. Upon completion of topsoil surfacing stage, 50 percent of the authorized amount for **Turf Establishment, Performance** will be paid to the Contractor. The remaining 50 percent of the authorized amount will be paid upon completion of all other work necessary to comply with this special provision and to meet all final acceptance parameters for **Turf Establishment, Performance** or at such time as the supplemental performance bond is accepted by the Department.

The supplemental performance bond and all costs associated with turf establishment work performed during the duration of the performance bond will not be paid for separately. These costs which may include, but are not limited to, mobilization, traffic control devices, and the required permit insurance are included in the unit price bid for **Turf Establishment, Performance**.

MICHIGAN  
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION  
FOR  
WATER MAIN CONFLICT

MAR:SF

1 of 1

C&T:APPR:SJU:DBP:02-28-12

**a. Description.** This work consists of relocating a portion of water main to avoid a conflict with a proposed sewer, where proposed water main is not otherwise being installed. This work includes furnishing all labor, equipment, and materials required for excavation, installation, disinfection, and backfilling as shown on the plans and specified herein.

**b. Materials.** All material must be in accordance with section 823 of the Standard Specifications for Construction.

**c. Construction.** All construction methods must be in accordance with section 823 of the Standard Specifications for Construction.

**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:

<b>Pay Item</b>	<b>Pay Unit</b>
Water Main Conflict, __ inch.....	Each

**Water Main, Conflict, \_ inch** applies to those water mains where it is necessary to relocate a portion of the existing water main due to direct conflict with a proposed sewer or as approved by the Engineer. **Water Main, Conflict, \_\_ inch** includes furnishing and installing pipe and miscellaneous fittings as needed. Excavating, backfilling, pavement cuts and repairs, jacking or boring, disinfection, supporting of existing utilities, and any other items or operations necessary to complete the work ready for use is not to be paid for separately but is to be included in **Water Main, Conflict, \_\_ inch**. This pay item only applies at isolated locations where proposed water main is not otherwise being installed.

## CITY OF BATTLE CREEK

### SPECIAL PROVISION FOR EMBANKMENT, SITE

OHM: AMB

1 of 2

7/9/2018

**a. Description.** This work consists of providing all labor, equipment and materials required for furnishing, hauling, placing, spreading, shaping, compacting and maintaining the proposed embankment in accordance with section 205 of the Standard Specifications for Construction, except as modified here.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction. Excavated material shall be reused on the project as embankment if determined suitable and approved by the Engineer. Borrow material is subject to approval by the Engineer.

Embankment shall be excavated (on-site) soil material or borrow material and generally be granular, free from frozen earth, boulders, rocks, stones larger than 3 inch in size, debris, expansive clays, and organic material.

**c. Construction.**

1. On sites which call for both excavation and embankment (cut and fill), the contractor shall balance the site prior to hauling off or importing material. The Engineer shall assess the suitability of excavated soil for use as on-site embankment and shall approve the quantity of soil to be exported, imported, or balanced in advance of the operations.
2. Contractor shall fill with suitable earth material the areas identified on the plans where final or proposed grades are higher than existing or interim grades in areas for proposed pavement, walks, utility construction, open space, or other proposed feature.
3. Contractor shall place fill on soils free of mud, frost, snow, or ice.
4. Contractor shall maintain the overall storm water flow direction of the site until measures and utilities are in place to manage the modified or final flow condition.
5. Contractor shall prepare subgrade in fill areas by smoothly grading and compacting the surface with equipment necessary to achieve the specified density.
6. Contractor shall place fill material in 12 inch lifts and compact the entire lift to the specified density before placing an additional lift. This procedure shall be repeated until all areas have reached indicated subgrade elevation.
7. Embankment material shall be placed in layers not to exceed 12 inches in thickness unless the Contractor can demonstrate to the satisfaction of the Engineer that he can consistently attain the specified density on thicker lifts.
8. If the moisture content of cohesive fill material exceeds the optimum moisture content for maximum density by more than three percent (3%), the Contractor shall dry the material to meet the foregoing moisture content limitation or provide, at his own expense, MDOT Granular Material Class III. No sloppy or wet backfill will be allowed, as determined by the Engineer.

- 9. Minimum density: not less than 95 percent (not average 95 percent) of all tests of maximum unit weight when tested in accordance with ASTM D 6938 (nuclear gauge).
- 10. Maximum unit weight will be determined by ASTM D 1557 (modified proctor), current methods of Test for Compaction and Density of Soil, AASHTO Designation T-180 or by the Cone Density Method developed by MDOT, as directed by the Owner or Owner's Representative.
- 11. If job excavated material is not suitable to obtain 95 percent minimum compaction, the Contractor shall, at his expense, remove unsuitable materials and replace with granular materials, to obtain ninety-five percent (95%) minimum compaction as specified.
- 12. Compaction tests will be made by a representative of the Owner and paid for by the Owner, unless otherwise specified in the Contract Documents.
- 13. Any depression resulting from settlement of any backfill prior to the date of final payment for all work under this contract shall be brought to the proper grade and surface and made to match the adjacent surface.
- 14. Construct all work in accordance with the applicable sections of the standard specifications. Grade the area as required and to the requirements as shown on the plans.

**d. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Embankment, Site .....	Cubic Yards

All embankment will be paid by the in-place cubic yard and shall include all materials, labor, and equipment necessary to complete the work as described in this specification.

Measurement shall be by the Engineer, using pre-construction and post-construction surveys. The approved net change in earth volume in non-roadway areas that have a higher post-construction elevation than the pre-construction elevation will be paid as **Embankment, Site**.

Stripping, stockpiling, placement, and restoration of topsoil shall be paid under a different item and shall not be included in the measured and paid quantity for **Embankment, Site**.

Repeated handling of earth materials and/or relocating of stockpiles in order to comply with project-required staging, phasing, traffic control, or execution shall be considered incidental to the contract.

All stockpiles shall be removed from the site at the conclusion of the project at no additional cost.

Hauling of unsuitable or excess soil materials off site shall be incidental to the contract. Furnishing and hauling of embankment material to each site shall be incidental to the contract.

## CITY OF BATTLE CREEK

### SPECIAL PROVISION FOR EXCAVATION, SITE

OHM: AMB

1 of 2

7/9/2018

**a. Description.** This work consists of earthwork on private property in order to grade the site according to the contract drawings and as directed by the Engineer. Work shall be performed in accordance with the 2012 MDOT Standard Specifications for Construction, contract plan drawings and details, and this special provision.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction. Excavated material shall be reused on the project as embankment if determined suitable and approved by the Engineer.

**c. Construction.**

1. Utility Locator Service: Notify MISS DIG for area where Project is located before beginning excavation. Provide a minimum of three full working days advance notification.
2. All excavation shall be by open cut from the surface using appropriate and efficient equipment to handle the materials.
3. On sites which call for both excavation and embankment (cut and fill), the contractor shall balance the site prior to hauling off or importing material. The Engineer shall assess the suitability of excavated soil for use as on-site embankment and shall approve the quantity of soil to be exported, imported, or balanced in advance of the operations.
4. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
5. Unauthorized Excavation is defined as below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Excavation in fill areas (areas that call for embankment or fill) require permission from the Engineer to be considered authorized.
6. Excavate and grade soils as needed to construct to the contract plans and details where final or proposed grades are lower than existing or interim grades in areas for proposed pavement, walks, utility construction, open space, or other proposed feature.
7. Contractor shall prepare subgrade in excavation areas by smoothly grading and compacting the subgrade to at least 95% of its maximum unit weight with equipment necessary to achieve the specified density.
8. Stockpile job excavated soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
9. All excavation and grading must be done in such a manner as to provide positive drainage, disperse runoff and control erosion.

10. Construct all work in accordance with the applicable sections of the standard specifications. Grade the area as required and to the requirements as shown on the plans.

d. **Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Excavation, Site.....	Cubic Yards

All excavation will be paid by the in-place cubic yard and shall include all materials, labor, and equipment necessary to complete the work as described in this specification.

Measurement shall be by the Engineer, using pre-construction and post-construction surveys. The approved change in earth volume in non-roadway areas that have a lower post-construction elevation than the pre-construction elevation will be paid as **Excavation, Site**.

Stripping, stockpiling, placement, and restoration of topsoil shall be paid under a different item and shall not be included in the measured and paid quantity for **Excavation, Site**.

Repeated handling of earth materials and/or relocating of stockpiles in order to comply with project-required staging, phasing, traffic control, or execution shall be considered incidental to the contract.

All stockpiles shall be removed from the site at the conclusion of the project at no additional cost. Any materials left on site will be deducted from the calculated pay quantity for **Excavation, Site**.

Hauling of unsuitable or excess soil materials off site shall be incidental to the contract.

Unauthorized excavation, as well as remedial work directed by Engineer, shall be executed without payment.

**CITY OF BATTLE CREEK**

**SPECIAL PROVISION  
FOR  
EROSION CONTROL, STRAW WATTLE CHECK DAM**

OHM: amb

1 of 1

7/9/2018

**a. Description.** The work shall consist of laying and anchoring straw-filled tubes made of on the contour across the slope. The wattles are placed on the contour to intercept water flowing down the slope or along a swale/ditch and trap the sediments being moved with the water. Work shall be performed in accordance with the 2012 MDOT Standard Specifications for Construction, contract plan drawings and details, and this special provision.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction.

1. The tubes shall be jute, nylon, or other photo-degradable materials, 8 to 12 inches in diameter filled with compressed, weed-free straw. The individual tubes shall be 20 to 25 feet in length.
2. Stakes shall be 1" x 2", 1" x 1", or 2" x 2" wood stakes 18" to 24" in length

**c. Construction.** Placement shall be in accordance with the contract plans, the Engineer, and the local soil erosion regulator. In the event of a conflict, the local regulator shall take precedence.

Excavate a 2-3" deep trench for placement of the wattle and install so that it contours to the soil surface. Compact soil from the excavated trench against the wattle on the uphill/upstream side.

Install stakes every 5 feet along the wattle and at each end.

Spacing of check dams shall be per plan or as directed by the Engineer, no greater than 50 feet for slopes 6:1 or flatter.

**d. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Erosion Control, Straw Wattle Check Dam .....	Each

All relocation items will be paid by the Each, for each item furnished and installed and shall include all materials, labor, and equipment necessary to complete the work as described in this specification. Removal and replacement of installed wattles that become damaged through use or filled with sediment shall be incidental to the contract. Removal of wattles at the conclusion of the project, after restoration and seed establishment, and when permitted by the Owner or the local regulator shall be incidental to the contract.

## CITY OF BATTLE CREEK

### SPECIAL PROVISION FOR SITE RESTORATION

OHM: AMB

1 of 2

7/9/2018

**a. Description.** This work consists of providing all labor, equipment and materials required for furnishing, placing, spreading, and maintaining the seeding required to restore the disturbed areas of the site in accordance with section 816 of the Standard Specifications for Construction, except as modified here.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction.

Topsoil shall be salvaged (stripped) topsoil that is free of roots, debris, and other deleterious materials.

Provide seed that complies with TUF mix per MDOT Specification 917

Fertilizers shall comply with MDOT Section 917.

**c. Construction.**

1. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1 inch in any dimension, and other objects that may interfere with planting or maintenance operations.
2. Prepare planting area for soil placement and mix planting soil according to MDOT Section 816.
3. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
4. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.
5. Sow and Rake seed in accordance with MDOT Specification 816.03.C.1
6. Protect seeded areas by installing mulch blankets (separate pay item).
7. Hydroseeding may be used as an alternative seeding method, at no additional cost to the owner. Hydroseeding shall be performed in accordance with MDOT Specification 816.
8. Any depression resulting from settlement of any backfill prior to the date of final payment for all work under this contract shall be brought to the proper grade and surface and made to match the adjacent surface. Restoration of repaired areas shall be incidental.
9. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

- 10. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings.
- 11. Contractor shall be responsible for mowing as directed by the Owner.
- 12. Satisfactory Site Restoration: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
- 13. Construct all work in accordance with the applicable sections of the standard specifications. Grade the area as required and to the requirements as shown on the plans.

**d. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Site Restoration.....	Acre

All site restoration will be paid by the acre and shall include all materials, labor, and equipment necessary to complete the work as described in this specification.

Measurement shall be by the Engineer, using the contract plans. Areas disturbed by incidental construction traffic or expanded activities by the contractor, which are not shown on the plans, shall be restored per this provision, but excluded from measurement and payment.

Stripping, stockpiling, and placement of topsoil shall be paid under a different item.

Salvaged topsoil that has been contaminated or intermixed with other materials, as determined by the Engineer, shall be removed from the site and replaced with screened, suitable topsoil, acceptable to the Engineer, at no additional cost.

CITY OF BATTLE CREEK

SPECIAL PROVISION  
FOR  
STRIPPING AND STOCKPILING TOPSOIL

OHM: AMB

1 of 2

7/9/2018

**a. Description.** This work consists of providing all labor, equipment and materials required for excavating, stockpiling, placing, and preparing topsoil for site restoration as required in the disturbed areas of the site in accordance with the Standard Specifications for Construction, except as modified here.

**b. Materials.** Materials used shall be consistent with material required for similar items of work as specified in the 2012 MDOT Standard Specifications for Construction.

Topsoil for restoration (separate pay item) shall be salvaged (stripped) topsoil that is free of roots, debris, and other deleterious materials.

Imported topsoil shall comply with Section 917.

**c. Construction.**

1. Remove and dispose of all vegetation, roots, stumps, and debris.
2. Strip or excavate topsoil from areas as indicated on the plans to the full depth as indicated.
3. Stockpile topsoil, without intermixing or contaminating.
4. Upon completion of all grading, embankment, and other excavation work, place the salvaged topsoil in the disturbed areas in accordance with Section 816 of the Standard Specifications for Construction.
5. Surplus topsoil shall be stockpiled or placed as directed by the Engineer.
6. Execute **Site Restoration** as directed within that Special Provision.

**d. Measurement and Payment.** The completed work as described will be measured and paid for at the contract unit price for the following contract items (pay items):

<u>Pay Item</u>	<u>Pay Unit</u>
Stripping and Stockpiling Topsoil.....	Cubic Yard

All topsoil stripping and stockpiling will be paid by the in-place cubic yard and shall include all materials, labor, and equipment necessary to complete the work as described in this specification.

Topsoil shall be measured using the contract plans, surveys, field measurement, soil borings, and/or test pits as determined by the Engineer.

Stockpiling, placement, and preparation of topsoil for site restoration shall be considered incidental to this pay item.

Site restoration and excavation of subgrade soil shall be paid under different items.

Salvaged topsoil that has been contaminated or intermixed with other materials, as determined by the Engineer, shall be removed from the site and replaced with screened, suitable topsoil, acceptable to the Engineer, at no additional cost.

Vegetation and debris removal shall be considered incidental to this pay item.

## ITEM X-100 GENERAL PAY ITEMS

### DESCRIPTION

**100-1.1** This item shall consist of work and operations, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

### MATERIALS

**100-2.1 Posted Notices.** Prior to commencement of construction activities the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor. These notices must remain posted until final acceptance of the work by the Owner. The Contractor shall replace documents as requested by Owner or Engineer should they become damaged due to weather or other reasons.

a. Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended

**100-2.2 Construction Safety and Phasing.** All materials required for Contractor compliance with the approved Construction Safety and Phasing Plan and Safety Plan Compliance Document shall be as indicated on the plan sheets and as directed by the Engineer.

### METHOD OF MEASUREMENT

**100-3.1** Mobilization shall be measured as a lump sum item and shall include preparatory, continuing, and close out operations which are necessary direct costs to the Contractor but are of a general nature and not directly attributable to, or specified as incidental to, other contract pay items. This item shall include, but is not limited to, movement of personnel, equipment, supplies and incidentals to the project sites; establishment of the Contractor's offices, buildings, and facilities necessary to undertake the work; operations which must be performed and costs incurred prior to beginning work on other pay items; preconstruction costs exclusive of bidding costs, including public and private utility investigation and locating; continuing general conditions and general maintenance of the contract; restoration and general clean-up of the contract areas; and other similar costs.

**100-3.2** Safety and Security shall be measured as a lump sum item and shall include direct costs to the Contractor involving safety of aircraft, on site surface transportation, and the general public, which costs are not directly attributable to, or specified as incidental to, other contract pay items. This item shall include, but is not limited to, furnishing, installing, maintaining, moving and removing of all necessary temporary signs, flags, barricades, lights, and devices, to protect air traffic in active air operations areas, and affected pedestrians and surface transportation in contract areas; operations and vehicle identification devices on controlled airports; providing security of Contractor's areas and openings in boundaries of airports; and other similar costs.

### BASIS OF PAYMENT

**100-4.1** Based upon the contract lump sum price for Mobilization, partial payments will be allowed as follows:

a. When 5% or more of the original contract is earned, 25%.

- b. When 15% or more of the original contract is earned, an additional 15%.
- c. When 25% or more of the original contract is earned, an additional 10%.
- d. When 50% or more of the original contract is earned, an additional 25%.
- e. When 75% or more of the original contract is earned, an additional 15%.

f. After final inspection, staging area clean-up and delivery of all project closeout materials as required by 90-11, the final 10%.

The total sum of all payments for this item shall not exceed the original contract amount bid for Mobilization, regardless of the fact that the Contractor may have for any reason, shut down work on the project, moved equipment away from the project and then back again, or for additional quantities or items of work added to the contract.

**100-4.2** Based upon the contract lump sum price for Safety and Security, partial payments will be allowed as follows:

- a. When 5% or more of the original contract is earned, 15%.
- b. When 15% or more of the original contract is earned, an additional 5%.
- c. When 25% or more of the original contract is earned, an additional 5%.
- d. When 50% or more of the original contract is earned, an additional 25%.
- e. When 75% or more of the original contract is earned, an additional 25%.

f. After final inspection, staging area clean-up and delivery of all project closeout materials as required by 90-11, the final 25%.

Payment will be made under:

- Item 100001            Mobilization – per lump sum
- Item 100002            Safety and Security – per lump sum

END OF ITEM X-100

## ITEM P-101 SURFACE PREPARATION

### DESCRIPTION

**101-1.1** This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable drawings.

### EQUIPMENT

**101-2.1** All equipment shall be specified here and in the following paragraphs or approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

### CONSTRUCTION

#### **101-3.1 Removal of existing pavement.**

**a. Concrete pavement.** The existing concrete pavement to be removed shall be freed from the pavement to remain by sawing through the complete depth of the slab one foot (30 cm) inside the perimeter of the final removal limits or outside the dowels, whichever is greater when the limits of removal are located on the joints. The pavement between the perimeter of the pavement removal and the saw cut shall be carefully broken up and removed using hand-held jackhammers, weighing 30 pounds (14 kg) or less, or other light-duty equipment which will not cause distress in the pavement which is to remain in place. The Contractor shall have the option of sawing through the dowels at the joint, removing the pavement and installing new dowels. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, then the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods suitable to the Engineer which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size designated by the Engineer. The Contractor's removal operation shall not cause damage to cables, utility ducts, pipelines, or drainage structures under the pavement. Concrete slabs that are damaged by under breaking shall be removed. Any damage shall be repaired at the Contractor's expense.

**b. Asphalt concrete pavement.** Asphalt concrete pavement to be removed shall be cut to the full depth of the bituminous material around the perimeter of the area to be removed. The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot (30 cm) from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil. The material shall be disposed of off-site.

**101-3.2 Preparation of joints and cracks.** Remove all vegetation and debris from cracks to a minimum depth of 1 inch (25 mm). If extensive vegetation exists treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks, ignoring hairline cracks (< 1/4 inch (6 mm) wide) with a crack sealant per ASTM D6690. Wider cracks (over 1-1/2 inch wide (38 mm)), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below. Any excess joint or crack sealer on the surface of the pavement shall also be removed from the pavement surface.

**101-3.3 Removal of paint and rubber.** All paint and rubber over 1 foot (30 cm) wide that will affect the bond of the new overlay shall be removed from the surface of the existing pavement. Chemicals, high-pressure water, heater scarifier (asphaltic concrete only), cold milling, or sandblasting may be used. Any methods used shall not cause major damage to the pavement. Major damage is defined as changing the properties of the pavement or removing pavement over 1/8 inch (3 mm) deep. If chemicals are used, they

shall comply with the state's environmental protection regulations. No material shall be deposited on the runway shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

#### **101-3.4 Concrete spall or failed asphaltic concrete pavement repair.**

**a. Repair of concrete spalls in areas to be overlaid with asphalt.** The Contractors shall repair all spalled concrete as shown on the plans or as directed by the Engineer. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches (50 mm) deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphaltic concrete with a minimum Marshall stability of 1,200 lbs (544 kg) and maximum flow of 20 (units of 0.01 in). The material shall be compacted with equipment approved by the Engineer until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches (100 mm) in depth. This method of repair applies only to pavement to be overlaid.

**b. Asphaltic concrete pavement repair.** The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. The base course and subbase shall be replaced if it has been infiltrated with clay, silt, or other material affecting the load-bearing capacity. Materials and methods of construction shall comply with the other applicable sections of this specification.

**101-3.5 Cold milling.** Milling shall be performed with a power-operated milling machine or grinder, capable of producing a finished surface that provides a good bond to the new overlay. The milling machine or grinder shall operate without tearing or gouging the under laying surface. The milling machine or grinder shall be equipped with automatic grade and slope controls. All millings shall be removed and disposed off Airport property, unless otherwise specified. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material that was removed with new material at no additional cost to the Owner.

**a. Patching.** The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The Engineer shall layout the area to be milled with a straightedge in increments of 1 foot (30 cm) widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall not be included in the measurement for payment.

**b. Profiling, grade correction, or surface correction.** The milling machine shall have a minimum width of 7 feet (2 m) and it shall be equipped with electronic grade control devices that will cut the surface to the grade and tolerances specified. The machine shall cut vertical edges. A positive method of dust control shall be provided. The machine shall have the ability to remove the millings or cuttings from the pavement and load them into a truck.

**c. Clean-up.** The Contractor shall sweep the milled surface daily and immediately after the milling until all residual aggregate and fines are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove any remaining aggregate or fines.

**101-3.6. Preparation of asphalt pavement surfaces.** Existing asphalt pavements indicated to be treated with a surface treatment shall be prepared as follows:

**a.** Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt concrete similar to that of the existing pavement in accordance with paragraph 101-3.4.

**b.** Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

**101-3.7 Maintenance.** The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the Engineer. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

**101-3.8 Preparation of Joints in Rigid Pavement.**

**101-3.8.1 Removal of Existing Joint Sealant.** All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch (2 mm) from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry. Allow sufficient time to dry out joints prior to sealing.

**101-3.8.2 Cleaning prior to sealing.** Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Clean joints by sandblasting, or other method approved by the Engineer, on each joint face with nozzle held at an angle and not more than three inches (75 mm) from face. Following sandblasting, clean joints with air free of oil and water. Joint surfaces will be surface-dry prior to installation of sealant.

**101-3.9 Preparation of Cracks in Flexible Pavement.**

**101-3.9.1 Preparation of Crack.** Widen crack with router by removing a minimum of 1/16 inch (2 mm) from each side of crack. Immediately before sealing, joints will be blown out with a hot air lance combined with oil and water-free compressed air.

**101-3.9.2 Removal of Existing Sealant.** Existing sealants will be removed by routing. Following routing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

**METHOD OF MEASUREMENT**

**101-4.1 Pavement removal.** The unit of measurement for pavement removal shall be the number of square yards (square meters) removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment.

**BASIS OF PAYMENT**

**101-5.1 Payment.** Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item 101001                      Asphalt Pavement Removal – per square yard

**MATERIAL REQUIREMENTS**

ASTM D6690

Standard Specification For Joint And Crack Sealants, Hot Applied, For Concrete  
And Asphalt Pavements

**END OF ITEM P-101**

## ITEM P-151 CLEARING AND GRUBBING

### DESCRIPTION

**151-1.1** This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Engineer.

**a. Clearing** shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.

**b. Clearing and grubbing** shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the Engineer is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

### CONSTRUCTION METHODS

**151-2.1 General.** The areas denoted on the plans to be cleared or cleared and grubbed shall be staked on the ground by the Engineer. The clearing and grubbing shall be done at a satisfactory distance in advance of the grading operations.

All spoil materials removed by clearing or by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the Engineer. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case shall any discarded materials be left in windows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the Engineer and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the Engineer permission in writing from the property owner for the use of private property for this purpose.

Blasting shall not be allowed. The removal of existing structure and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone or telegraph pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the Engineer who will notify the proper local authority or owner to secure prompt action.

**151-2.2 Clearing.** The Contractor shall clear the staked or indicated area of all objectionable materials. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the Engineer. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a location designated by the Engineer if the fence is to remain the property of a local owner or authority.

**151-2.3 Clearing and grubbing.** In areas designated to be graded, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials shall be removed.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet (60 cm) below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes under embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

#### **METHOD OF MEASUREMENT**

**151-3.1** Clearing and grubbing is incidental to Topsoil Stripping and Restoration.

#### **BASIS OF PAYMENT**

**151-4.1** No direct payment will be made for clearing and grubbing. It shall be incidental to Topsoil Stripping and Restoration.

END OF ITEM P-151

## ITEM P-152 EXCAVATION, SUBGRADE, AND EMBANKMENT

### DESCRIPTION

**152-1.1** This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

**152-1.2 Classification.** All material excavated shall be classified as defined below:

**a. Unclassified excavation.** Unclassified excavation shall consist of the excavation, redistribution or disposal of all material, regardless of its nature which is not otherwise classified and paid for under one of the following items.

**b. Borrow placement.** Borrow placement shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from areas outside the airport boundaries and shall generally be free draining, free of organic material, and free of expansive clays that may experience excessive swelling and shrinking. Soils that meet the requirements of MDOT class III granular material shall be acceptable. If available soils do not meet the requirements of MDOT Class III, soils may be visually accepted by the on-site engineer when deemed suitable for use as engineering fill.

**152-1.3 Unsuitable excavation.** Any material containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the Engineer.

### CONSTRUCTION METHODS

**152-2.1 General.** Before beginning excavation, grading, and embankment operations in any area, the area shall be completely cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of off-site.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the Engineer notified. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the limits of the pavement areas where the top layer of soil material has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor, at his or her expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

**152-2.2 Excavation.** No excavation shall be started until the work has been staked out by the Engineer. All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be reused for restoration of the graded site. Topsoil handling shall be included in the Topsoil Stripping and Restoration item. All

suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes shown on the plans. All unsuitable material shall be disposed of off-site.

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or disposed as directed by the Engineer. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the work. Such temporary drains and drainage ditches shall be the responsibility of the Contractor and shall not be paid for separately but shall be included in other items of work. Any de-watering required shall be the responsibility of the Contractor.

**a. Selective grading.** *Not Applicable.*

**b. Undercutting.** Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the Engineer. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard (per cubic meter) for unclassified excavation. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

**c. Overbreak.** Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the Engineer. All overbreak shall be graded or removed by the Contractor and disposed of as directed by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his or her decision shall be final. Payment will not be made for the removal and disposal of overbreak that the Engineer determines as avoidable. Unavoidable overbreak will be classified as "Unclassified Excavation."

**d. Removal of utilities.** The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by someone other than the Contractor; for example, the utility unless otherwise shown on the plans. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the Engineer. All foundations thus excavated shall be backfilled with suitable material and compacted as specified.

**e. Compaction requirements.** The subgrade under all areas shall be compacted to a depth of 8 and to a density of not less than 95 percent of the maximum density as determined by ASTM D698. The material to be compacted shall be within  $\pm 2\%$  of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils).

The in-place field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade. The finished grading operations, conforming to the typical cross-section, shall be completed and maintained at least 1,000 feet (300 m) ahead of the paving operations or as directed by the Engineer.

All loose or protruding rocks on the back slopes of cuts shall be pried loose or otherwise removed to the slope finished grade line. All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the Engineer.

Blasting shall not be allowed.

**f. Proof rolling.** After compaction is completed, the subgrade area shall be proof rolled with a heavy pneumatic-tired roller having four or more tires abreast, each tire loaded to a minimum of 30,000 pounds (13.6 metric tons) and inflated to a minimum of 125 psi (0.861 MPa) in the presence of the Engineer. Apply a minimum of 25% coverage, or as specified by the Engineer, to all paved areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications.

**152-2.3 Borrow placement.** The Contractor shall notify the Engineer at least 15 days prior to beginning the excavation so necessary measurements and tests can be made. All borrow sites shall be opened up to expose the various strata of acceptable material to allow obtaining a uniform product. All unsuitable material shall be disposed of by the Contractor. Prior to any borrow source being utilized on the project, the Contractor shall submit test reports of material properties for the borrow source. The Engineer shall approve all sources and test results prior to any material from the borrow source being installed.

**152-2.4 Drainage excavation.** *Not Applicable*

**152-2.5 Preparation of embankment area.** Where an embankment is to be constructed all sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted as indicated in paragraph 152-2.6.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

**152-2.6 Formation of embankments.** Embankments shall be formed in successive horizontal layers of not more than 12 inches (300 mm) in loose depth for the full width of the cross-section, unless otherwise approved by the Engineer.

The layers shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the Engineer. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each layer shall be within  $\pm 2\%$  of optimum moisture content before rolling to obtain the prescribed compaction. To achieve a uniform moisture content throughout the layer, the material shall be moistened or aerated as necessary. The contractor shall take density measurements once per 3,000 square yards per lift.

Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density for noncohesive soils, and 90% of maximum density for cohesive soils as determined by ASTM D698.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm).

The in-place field density shall be determined in accordance with ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor's laboratory shall perform all density tests in the Engineer's presence and provide the test results upon completion to the Engineer for acceptance.

Compaction areas shall be kept separate, and no layer shall be covered by another layer until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each layer is placed. Layer placement shall begin in the deepest portion of the embankment fill. As placement progresses, the layers shall be constructed approximately parallel to the finished pavement grade line.

When rock and other embankment material are excavated at approximately the same time, the rock shall be incorporated into the outer portion of the embankment and the other material shall be incorporated under the future paved areas. Stones or fragmentary rock larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 6 inches (150 mm) of the subgrade. Rockfill shall be brought up in layers as specified or as directed by the Engineer and the finer material shall be used to fill the voids with forming a dense, compact mass. Rock or boulders shall not be disposed of outside the excavation or embankment areas, except at places and in the manner designated on the plans or by the Engineer.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet (60 cm) in thickness. Each layer shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The layer shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in layers, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

**152-2.7 Finishing and protection of subgrade.** After the subgrade is substantially complete, the Contractor shall remove any soft or other unstable material over the full width of the subgrade that will not compact properly. All low areas, holes or depressions in the subgrade shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes. All ruts or rough places that develop in the completed subgrade shall be graded and recompacted.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

**152-2.8 Haul.** All hauling of will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

**152-2.9 Tolerances.** In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a Contractor-furnished 12-foot (3.7-m) straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2 inch (12 mm), or shall not be more than 0.05 feet (15 mm) from true grade as established by grade hubs. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 feet (30 mm) from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

**152-2.10 Topsoil.** When topsoil is specified or required as shown on the plans or under specification T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall not be placed within 400 feet of runway pavement or 93 feet of taxiway pavement and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the Engineer, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further rehandling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as directed, or as required in Item T-905.

No direct payment will be made for topsoil under Item P-152. The quantity removed and placed directly or stockpiled shall be included in the payment for Topsoil Stripping and Restoration.

### METHOD OF MEASUREMENT

**152-3.1** The quantity of excavation to be paid for shall be the number of cubic yards measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

**152-3.2** Borrow material placement shall be paid for on the basis of the number of cubic yards measured in its final position.

### BASIS OF PAYMENT

**152-4.1** Unclassified Excavation payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

**152-4.5** Borrow Placement payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 152001	Unclassified Excavation – per cubic yard
Item 152002	Borrow Placement – per cubic yard

### TESTING REQUIREMENTS

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> (600 kN-m/m <sup>3</sup> ))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2700 kN-m/m <sup>3</sup> ))

ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

**END OF ITEM P-152**

## ITEM P-156 TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILTATION CONTROL

### DESCRIPTION

**156-1.1** This item shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be design, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

### MATERIALS

**156-2.1 Grass.** Grass that will not compete with the grasses sown later for permanent cover per Item T-901 shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

**156-2.2 Mulches.** Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

**156-2.3 Fertilizer.** Fertilizer shall be a standard commercial grade and shall conform to all Federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

**156-2.4 Slope drains.** Slope drains may be constructed of pipe, fiber mats, rubble, Portland cement concrete, bituminous concrete, or other materials that will adequately control erosion.

**156-2.5 Silt fence.** The silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

**156-2.6 Other.** All other materials shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

### CONSTRUCTION REQUIREMENTS

**156-3.1 General.** In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

**156-3.2 Schedule.** Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

**156-3.3 Construction details.** The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately if project conditions permit; otherwise, temporary erosion control measures may be required.

The Engineer shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the Engineer.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the Engineer. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the Engineer, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The Engineer may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be acceptably maintained by the Contractor during the construction period.

Whenever construction equipment must cross watercourses at frequent intervals, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

**156-3.4 Installation, maintenance and removal of silt fences.** Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence

shall be removed upon approval of the Engineer. The Contractor is responsible for the removal/disposal of all temporary erosion/pollution control items and the restoration of those sites upon approval of the Engineer. This work will include the repair of any trenching for silt fence, removal of silt build-up, removal of fencing, barriers and silt bales and the associated stakes and the placing of seed or sod to restore those sites.

**156-3.5 Installation, maintenance and removal of check dams.** Check dams shall be made of hay or straw bales lined end to end and staked in place with wooden stakes. No gaps shall be allowed between the bales at the ground surface. Check dams shall be 20' in length centered on the ditch line. The check dams shall be maintained in good working condition by the contractor until permanent erosion control is established. The Contractor is responsible for the removal/disposal of all temporary erosion/pollution control items and the restoration of those sites upon approval of the Engineer. This work will include the repair of grade, removal of silt build-up, removal of bales and the associated stakes and the placing of seed or sod to restore those sites.

### METHOD OF MEASUREMENT

**156-4.1** Temporary erosion and pollution control work required will be performed as scheduled or directed by the Engineer. Completed and accepted work will be measured as follows:

- a. Installation and removal of silt fence will be measured by the linear foot (meter).

**156-4.2** Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

### BASIS OF PAYMENT

**156-5.1** Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the Engineer and measured as provided in paragraph 156-4.1 will be paid for under:

Item 156001                      Installation and Removal of Silt Fence – per linear feet

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the Engineer will be paid for as Extra work.

### MATERIAL REQUIREMENTS

ASTM D6461                      Standard Specification for Silt Fence Materials  
AC 150/5200-33                      Hazardous Wildlife Attractants

END OF ITEM P-156

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**ITEM P-219 RECYCLED CONCRETE AGGREGATE BASE COURSE**

**DESCRIPTION**

**219-1.1** This item consists of a base course composed of recycled concrete aggregate, crushed to meet a particular gradation, constructed on a prepared course per these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

**MATERIALS**

**219-2.1 Aggregate.** Recycled concrete aggregate shall consist of Portland cement concrete (PCC) or other concrete containing pozzolanic binder material. The recycled concrete material shall be free of reinforcing steel and expansion material. Asphalt concrete overlays shall be removed from the PCC surface prior to pavement removal and crushing. Any full-slab asphalt concrete panels (used as a replacement for a removed PCC slab) shall also be removed. An incidental amount of recycled asphalt concrete pavement and other foreign material may be present in the recycled concrete aggregate.

Recycled concrete aggregate base course shall consist of at least 90%, by weight, Portland cement concrete, with the remaining 10% consisting of the following materials:

Wood	0.1% maximum
Brick, mica, schist, or other friable materials	4% maximum
Asphalt concrete	10% maximum

Virgin aggregates may be added to meet the 90% minimum PCC requirement.

The percentage of wood, brick, mica, schist, other friable materials, and asphalt concrete shall be determined by weighing that material retained on the No. 4 sieve, and dividing by the total weight of recycled concrete aggregate material retained on the No. 4 sieve.

The fine aggregate shall be produced by crushing stone, gravel, slag, or recycled concrete that meet the requirements for wear and soundness specified for coarse aggregate. Fine aggregate may be added to produce the correct gradation.

The amount of flat and elongated particles in recycled concrete aggregate shall not exceed 20% for the fraction retained on the 1/2 inch (12 mm) sieve nor 20% for the fraction passing the 1/2 inch (12 mm) sieve when tested per ASTM D4791. A flat particle is one having a width to thickness ratio greater than 3; an elongated particle is one having a length to width ratio greater than 3.

The percentage of wear shall not be greater than 45% when tested per ASTM C131. The sodium sulfate soundness test (ASTM C88) requirement is waived for recycled concrete aggregate.

The fraction passing the No. 40 (0.42-mm) sieve shall have a liquid limit no greater than 25 and a plasticity index of not more than four (4) when tested per ASTM D4318. The fine aggregate shall have a minimum sand equivalent value of 35 when tested per ASTM D2419.

**a. Sampling and testing.** Recycled concrete aggregate samples for preliminary testing shall be furnished by the Contractor prior to the start of base construction. All tests for initial aggregate submittals necessary to determine compliance with the specification requirements will be made by the Engineer at no expense to the Contractor.

Samples of recycled concrete aggregate shall be furnished by the Contractor at the start of production and at intervals during production. The sampling points and intervals will be designated by the Engineer.

The samples will be the basis of approval of specific lots of recycled concrete aggregate for the quality requirements.

Samples of recycled concrete aggregate to check gradation shall be taken at least once daily. Sampling shall be per ASTM D75, and testing shall be per ASTM C136 and ASTM C117.

**b. Gradation requirements.** The gradation of the final mixture shall fall within the design range of MDOT 21AA dense graded aggregate, when tested per ASTM C117 and ASTM C136. The final gradation shall be continuously graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa.

**Requirements for Gradation Of Recycled Concrete Aggregate Base**

Sieve Size	Percentage by Weight Passing Sieves
1-1/2 inch (38 mm)	100
1 inch (25 mm)	85 - 100
1/2 inch (18 mm)	50 - 75
No. 8 (9.50 mm)	20 - 45
No. 200 (0.075 mm)	4 - 8

**EQUIPMENT**

**219-3.1 General.** All equipment necessary to mix, transport, place, compact, and finish the recycled concrete aggregate base course shall be furnished by the Contractor. The Contractor shall provide written certification to the Engineer that all equipment meets the requirements for this section. The equipment shall be inspected by the Engineer at the job site prior to the start of construction operations.

**219-3.2 Mixing equipment.** Base course shall be thoroughly mixed in a plant suitable for recycled concrete aggregate. The mixer shall be a batch or continuous-flow type equipped with a calibrated metering and feeding device that introduce the aggregate and water into the mixer in specified quantities. If necessary, a screening device shall be installed to remove oversized material greater than 2 inches (50 mm) from the recycled concrete aggregate feed.

The Engineer shall have access to the plant at all times for inspection of the plant’s equipment and operation and for sampling the mixed recycled concrete aggregate materials.

**219-3.3 Hauling equipment.** The mixed recycled concrete aggregate base course shall be transported from the plant to the job site in hauling equipment having beds that are smooth, clean, and tight. Truck bed covers shall be provided and used to protect the mixed recycled concrete aggregate base course from rain during transport.

**219-3.4 Placing equipment.** Recycled concrete aggregate shall be placed using a mechanical spreader or machine capable of receiving, spreading, and shaping the material into a uniform layer or lift without segregation. The placing equipment shall be equipped with a strike off plate that can be adjusted to the layer thickness.

**219-3.5 Compaction equipment.** Recycled concrete aggregate base course shall be compacted using one or a combination of the following pieces of equipment: steel-wheeled roller; vibratory roller; pneumatic-tire roller; and/or hand-operated power tampers (for areas inaccessible to rollers).

**219-3.6 Finishing equipment.** Trimming of the compacted recycled concrete aggregate to meet surface requirements shall be accomplished using a self-propelled grader or trimming machine, with a mold board cutting edge of 12 feet (3.7 m) minimum width automatically controlled by sensors in conjunction with an independent grade control from a taut stringline. Stringline will be required on both sides of the sensor controls for all lanes.

## CONSTRUCTION METHODS

**219-4.1 Weather limitations.** Construction is allowed only when the atmospheric temperature is at or above 35°F (2°C). When the temperature falls below 35°F (2°C), the Contractor shall protect all completed areas against detrimental effects of freezing. The Contractor shall repair any areas damaged by freezing, rainfall, or other weather conditions.

**219-4.2 Preparing underlying course.** The underlying course shall be checked by the Engineer before placing and spreading operations are started. Any ruts or soft yielding places caused by improper drainage conditions, hauling, or any other cause shall be corrected at the Contractor's expense before the base course is placed there. Material shall not be placed on frozen material.

To protect the existing layers and to ensure proper drainage, the spreading of the recycled concrete aggregate base course shall begin along the centerline of the pavement on a crowned section or on the greatest contour elevation of a pavement with a variable uniform cross slope.

**219-4.3 Grade control.** Grade control between the edges of the recycled concrete aggregate base course lanes shall be accomplished by grade stakes, steel pins, or forms placed in lanes parallel to the centerline and at intervals of 50 feet (15 m) or less on the longitudinal grade and 25 feet (7.5 m) or less on the transverse grade.

**219-4.4 Mixing.** The recycled concrete shall be uniformly blended during crushing operations and mixed with water in a mixing plant suitable for recycled concrete aggregate. The plant shall blend and mix the materials to meet the specifications and to secure the proper moisture content for compaction.

**219-4.5 Placing.** The recycled concrete aggregate base material shall be placed on the moistened subgrade or base in layers of uniform thickness with an approved mechanical spreader.

The maximum depth of a compacted layer shall be 6 inches (150 mm). If the total depth of the compacted material is more than 6 inches (150 mm), it shall be constructed in two or more layers. In multi-layer construction, the material shall be placed in approximately equal-depth layers.

The previously constructed layer shall be cleaned of loose and foreign material prior to placing the next layer. The surface of the compacted material shall be kept moist until covered with the next layer.

Adjustments in placing procedures or equipment shall be made to obtain grades, to minimize segregation grading, to adjust the water content, and to ensure an acceptable recycled concrete aggregate base course.

**219-4.6 Compaction.** Immediately after completion of the spreading operations, the recycled concrete aggregate shall be compacted. The number, type, and weight of rollers shall be sufficient to compact the material to the required density.

Each layer of the recycled concrete aggregate base course shall be compacted to the required density using the compaction equipment. The moisture content of the material during placing operations shall be within  $\pm 1\frac{1}{2}$  percentage points of the optimum moisture content as determined by ASTM D698.

The compaction shall continue until each layer has reached compaction that is at least 100% of the laboratory maximum density through the full depth of the layer. The Contractor shall make adjustments in compacting or finishing techniques to obtain true grades, to minimize segregation and degradation, to reduce or increase water content and to ensure a satisfactory base course. Any unsatisfactory materials shall be removed and replaced with satisfactory material or reworked, to meet the requirements of this specification.

**219-4.7 Acceptance sampling and testing for density.** The Contractor's laboratory shall perform all density tests in the Engineer's presence and provide the test results upon completion daily to the Engineer for acceptance. Recycled concrete aggregate shall be accepted for density on a lot basis. A lot will consist of one day's production where it does not exceed 2,400 square yards (2000 sq m) per lift. A lot will consist of one-half day's production, where a day's production is between 2,400 and 4,800 square yards (2000 and 4000 sq m) per lift.

Each lot shall be divided into two equal sublots. One density test shall be made for each subplot and shall consist of the average of two random locations for density determination. Sampling locations will be determined by the Engineer on a random basis per ASTM D3665.

Each lot will be accepted for gradation when it falls within the limits and tolerances shown in the table above when tested per ASTM C117 and ASTM C131. If the proper gradation is not attained the gradation test will be repeated. If the re-test does not indicate gradations within the limits of the table above, the entire lot shall be rejected and replaced by the Contractor at the Contractor's expense.

Each lot will be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens prepared from samples of the base course material. The specimens shall be compacted and tested per ASTM D698. The in-place field density shall be determined per ASTM D6938. The field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method and the machines shall be calibrated in accordance with per ASTM D6938. When using the nuclear method, ASTM D4643 shall be used to determine the moisture content of the material. If the specified density is not attained, the entire lot shall be reworked and two additional random tests made. This procedure shall be followed until the specified density is reached.

**219-4.8 Finishing.** The surface of the recycled concrete aggregate base course shall be finished by equipment designed for this purpose.

Adding a thin layer of material to the top of the base course to meet grade shall not be allowed. If the elevation of the layer is 1/2 inch (12 mm) or more below grade, the layer shall be scarified to a depth of at least 3 inches (75 mm), new material added, and the layer shall be recompact. If the finished surface is above plan grade, it shall be cut back to grade and rerolled. The grade shall be measured on a maximum 25-foot (7.5-m) grid (longitudinal and transverse). Thickness results shall be furnished to the Engineer daily for acceptance determination.

Should the surface become rough, corrugated, uneven in texture, or traffic marked prior to completion, the unsatisfactory portion shall be scarified, and recompact or replaced at the Contractor's expense.

**219-4.9 Surface tolerances.** The finished surface shall not vary more than 3/8 inch (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with or at right angles to the centerline. The Contractor shall correct any deviation in excess of this amount, at the Contractor's expense.

**219-4.10 Thickness control.** The completed thickness of the base course shall be within 1/2 inch (12 mm) of the design thickness. Four thickness determinations shall be made for each lot of material placed. Each lot shall be divided into four equal sublots and one test shall be made for each subplot. Sampling locations will be determined per ASTM D3665. Where the thickness is more than 1/2 inch (12 mm) deficient, the Contractor, at his or her expense, shall correct the areas by excavating to the required depth and replacing with new material. Additional test holes may be required to identify the limits of deficient areas.

**219-4.11 Traffic.** Equipment used in construction may be routed over completed portions of the base course, provided there is no damage to the base course. The equipment shall be routed evenly over the full width of the base course to avoid rutting or uneven compaction.

**219-4.12 Maintenance.** The base course shall be maintained until the base course is completed and accepted. Maintenance will include immediate repairs to any defects and shall be repeated as often as necessary to keep the completed work intact. The Contractor, at his or her expense, will rework any area of the recycled concrete aggregate base course that is damaged.

**METHOD OF MEASUREMENT**

**219-5.1** The quantity of recycled concrete aggregate base course will be determined by measurement of the number of cubic yards (cubic meters) of material actually constructed and accepted as complying with the plans and specifications.

**BASIS OF PAYMENT**

**219-6.1** Payment shall be made at the contract unit price per cubic yard (cubic meter) for recycled concrete aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 219001                      Recycled Concrete Aggregate Base Course – per cubic yard

**TESTING REQUIREMENTS**

- ASTM C29                      Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
- ASTM C88                      Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- ASTM D75                      Standard Practice for Sampling Aggregates
- ASTM C117                      Standard Test Method for Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing
- ASTM C131                      Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- ASTM C136                      Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregate
- ASTM D698                      Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
- ASTM D1556                      Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
- ASTM D1557                      Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2700 kN-m/m<sup>3</sup>))
- ASTM D2167                      Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber-Balloon Method
- ASTM D2419                      Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
- ASTM D3665                      Standard Practice for Random Sampling of Construction Materials

ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
ASTM D4718	Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

END OF ITEM P-219

## ITEM D-705 PIPE UNDERDRAINS FOR AIRPORTS

### DESCRIPTION

**705-1.1** This item shall consist of the construction of pipe drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

### MATERIALS

**705-2.1 General.** Materials shall meet the requirements shown on the plans and specified below.

**705-2.2 Pipe.** The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements.

American Association of State Highway and Transportation Officials (AASHTO) M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter
ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM C444	Standard Specification for Perforated Concrete Pipe
ASTM C654	Standard Specification for Porous Concrete Pipe
ASTM F758	Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride)(PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage

**705-2.3 Joint mortar.** Pipe joint mortar shall consist of one part by volume of Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

**705-2.4 Elastomeric seals.** Elastomeric seals shall conform to the requirements of ASTM F477.

**705-2.5 Porous backfill.** Porous backfill shall be free of clay, humus, or other objectionable matter, and shall conform to the gradation in Table 1 when tested in accordance with ASTM C136.

**Table 1. Gradation of Porous Backfill**

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
	Porous Material No. 2
1-1/2 inch (38 mm)	100
1 inch (25 mm)	90 - 100
3/8 inch (9 mm)	25 - 60
No. 4 (4.75 mm)	5 - 40
No. 8 (2.36 mm)	0 - 20
No. 16 (1.18 mm)	
No. 50 (0.30 mm)	
No. 100 (0.15 mm)	

When two courses of porous backfill are specified in the plans, the finer of the materials shall conform to particle size tabulated herein for porous material No. 1. The coarser granular material shall meet the gradation given in the tabulation for porous material No. 2.

**705-2.6. Granular material.** Granular material used for backfilling shall conform to the requirements of ASTM D2321 for Class IA, IB, or II materials, or shall meet the requirements of AASHTO Standard Specification for Highway Bridges Section 30.

**705-2.7. Filter fabric.** The filter fabric shall conform to the requirements of AASHTO M288 Class 2.

**Table 2**

<u>Fabric Property</u>	<u>Test Method</u>	<u>Test Requirement</u>
<b>Grab Tensile Strength, lbs</b>	ASTM D4632	125 min
<b>Grab Tensile Elongation %</b>	ASTM D4632	50 min
<b>Burst Strength, psi</b>	ASTM D3785	125 min
<b>Trapezoid Tear Strength, lbs</b>	ASTM D4533	55 min
<b>Puncture Strength, lbs</b>	ASTM D4833	40 min
<b>Abrasion, lbs</b>	ASTM D4886	15 max loss
<b>Equivalent Opening Size</b>	ASTM D4751	70-100
<b>Permittivity sec<sup>-1</sup></b>	ASTM D4491	0.80
<b>Accelerated Weathering (UV Stability) (Strength Retained - %)</b>	ASTM D4355 *(500 hrs exposure)	70

**705-2.8. Controlled low-strength material (CLSM).** CLSM is not allowed.

**CONSTRUCTION METHODS**

**705-3.1 Equipment.** All equipment required for the construction of pipe underdrains shall be on the project, in good working condition, and approved by the Engineer before construction is permitted to start.

**705-3.2 Excavation.** The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but shall not be less than the external diameter of the pipe plus 6 inches (150 mm) on each side of the pipe. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 4 inches (100 mm). The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches (150 mm) in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The Engineer shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the Engineer. The excavation shall not be carried below the required depth; if this occurs, the trench shall be backfilled at the Contractor's expense with material approved by the Engineer and compacted to the density of the surrounding material.

The pipe bed shall be shaped so at least the lower quarter of the pipe shall be in continuous contact with the bottom of the trench. Spaces for the pipe bell shall be excavated to allow the pipe barrel to support the entire weight of the pipe.

The Contractor shall do trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to Federal, state and local laws. Unless otherwise provided, the bracing, sheathing, or shoring shall be removed by the Contractor after the backfill has reached at least 12 inches (300 mm) over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot (meter) for the pipe.

### **705-3.3 Laying and installing pipe.**

**a. Concrete pipe.** The laying of the pipe in the finished trench shall be started at the lowest point and proceed upgrade. When bell and spigot pipe is used, the bells shall be laid upgrade. If tongue and groove pipe is used, the groove end shall be laid upgrade. Holes in perforated pipe shall be placed down, unless otherwise shown on the plans. The pipe shall be firmly and accurately set to line and grade so that the invert will be smooth and uniform. Pipe shall not be laid on frozen ground.

Pipe which is not true in alignment, or which shows any settlement after laying, shall be taken up and relaid by the Contractor at no additional expense.

**b. Metal pipe.** The metal pipe shall be laid with the separate sections joined firmly together with bands, with outside laps of circumferential joints pointing upgrade, and with longitudinal laps on the sides. Any metal in the pipe or bands that is not protected thoroughly by galvanizing shall be coated with a suitable asphaltum paint.

During installation, the asphalt-protected pipe shall be handled without damaging the asphalt coating. Any breaks in the bitumen or treatment of the pipe shall be refilled with the type and kind of bitumen used in coating the pipe originally.

**c. PVC or polyethylene pipe.** PVC or polyethylene pipe shall be installed in accordance with the requirements of ASTM D2321 or AASHTO Standard Specification for Highway Bridges Section 30. Perforations shall meet the requirements of AASHTO M252 or AASHTO M294 Class 2, unless otherwise indicated on the plans. The pipe shall be laid accurately to line and grade.

**d. All types of pipe.** The upgrade end of pipelines, not terminating in a structure, shall be plugged or capped as approved by the Engineer.

Unless otherwise shown on the plans, a 4 inch (100 mm) bed of granular backfill material shall be spread in the bottom of the trench throughout the entire length under all perforated pipe underdrains.

Pipe outlets for the underdrains shall be constructed when required or shown on the plans. The pipe shall be laid with tight-fitting joints. Porous backfill is not required around or over pipe outlets for underdrains. All connections to other drainage pipes or structures shall be made as required and in a satisfactory manner. If connections are not made to other pipes or structures, the outlets shall be protected and constructed as shown on the plans.

**e. Filter fabric.** The filter fabric shall be installed in accordance with the manufacturer's recommendations, or in accordance with AASHTO M288 Appendix, unless otherwise shown on the plans.

**705-3.4 Mortar.** The mortar shall be of the desired consistency for caulking and filling the joints of the pipe and for making connections to other pipes or to structures. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted.

**705-3.5 Joints in concrete pipe.** When open or partly open joints are required or specified, they shall be constructed as indicated on the plans. The pipe shall be laid with the ends fitted together as designed. If bell and spigot pipe is used, mortar shall be placed along the inside bottom quarter of the bell to center the following section of pipe.

The open or partly open joints shall be surrounded with granular material meeting requirements of porous backfill No. 2 in Table 1 or as indicated on the plans. This backfill shall be placed so its thickness will be not less than 3 inches (75 mm) nor more than 6 inches (150 mm), unless otherwise shown on the plans.

When the original material excavated from the trench is impervious, commercial concrete sand or granular material meeting requirements of porous backfill No. 1 shall surround porous backfill No. 2 (Table 1), as shown on the plans or as directed by the Engineer.

When the original material excavated from the trench is pervious and suitable, it may be used as backfill in lieu of porous backfill No. 1, when indicated on the plans or as directed by the Engineer.

#### **705-3.6 Backfilling.**

**a. Earth.** All trenches and excavations shall be backfilled soon after the pipes are installed, unless additional protection of the pipe is directed. The backfill material shall be select material from excavation or borrow and shall be approved by the Engineer. The select material shall be placed on each side of the pipe out to a distance of the nominal pipe diameter and one foot (30 cm) over the top of the pipe and shall be readily compacted. It shall not contain stones 3 inches (75 mm) or larger in size, frozen lumps, chunks of highly plastic clay, or any other material that is objectionable to the Engineer. The material shall be moistened or dried, as required to aid compaction. Placement of the backfill shall not cause displacement of the pipe. Thorough compaction under the haunches and along the sides to the top of the pipe shall be obtained.

The backfill shall be placed in loose layers not exceeding 6 inches (150 mm) in depth under and around the pipe, and not exceeding 8 inches (200 mm) over the pipe. Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the Engineer, until the trench is completely filled and brought to the planned elevation. Backfilling shall be done to avoid damaging top or side pressures on the pipe.

In embankments and other unpaved areas, the backfill shall be compacted per Item P-152 to the density required for embankments in unpaved areas. Under paved areas, the subgrade and any backfill shall be compacted per Item P-152 to the density required for embankments for paved areas.

**b. Granular backfill.** When granular backfill is required, placement in the trench and about the pipe shall be as shown on the plans. The granular backfill shall not contain an excessive amount of foreign matter, nor shall soil from the sides of the trench or from the soil excavated from the trench be allowed to filter into the granular backfill. When required by the Engineer, a template shall be used to properly place and separate the two sizes of backfill. The backfill shall be placed in loose layers not exceeding 6 inches (150 mm) in depth. The granular backfill shall be compacted by hand and pneumatic tampers to the requirements as given for embankment. Backfilling shall be done to avoid damaging top or side pressure on the pipe. The granular backfill shall extend to the elevation of the trench or as shown on the plans.

When perforated pipe is specified, granular backfill material shall be placed along the full length of the pipe. The position of the granular material shall be as shown on the plans. If the original material excavated from the trench is pervious and suitable, it shall be used in lieu of porous backfill No. 1.

If porous backfill is placed in paved or adjacent to paved areas before grading or subgrade operations is completed, the backfill material shall be placed immediately after laying the pipe. The depth of the granular backfill shall be not less than 12 inches (300 mm), measured from the top of the underdrain. During subsequent construction operations, a minimum depth of 12 inches (300 mm) of backfill shall be maintained over the underdrains. When the underdrains are to be completed, any unsuitable material shall be removed exposing the porous backfill. Porous backfill containing objectionable material shall be removed and replaced with suitable material. The cost of removing and replacing any unsuitable material shall be at the Contractor's expense.

If a granular subbase blanket course is used which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of 2 inches (50 mm) above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material that remains over the underdrain trench shall be removed and replaced. The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench.

**c. Controlled low-strength material (CLSM).** CLSM is not allowed.

**d. Deflection testing.** The Engineer may at any time, notwithstanding previous material acceptance, reject or require re-installation of pipe that exceeds 5% deflection when measured in accordance with ASTM D2321, including Appendices.

**705-3.7 Connections.** When the plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made to obtain a smooth uniform flow line throughout the drainage system.

**705-3.8 Cleaning and restoration of site.** After the backfill is completed, the Contractor shall dispose of all surplus material, soil, and rubbish from the site. Surplus soil may be deposited in embankments, shoulders, or as directed by the Engineer. Except for paved areas of the airport, the Contractor shall restore all disturbed areas to their original condition.

## METHOD OF MEASUREMENT

**705-4.1** The length of pipe shall be the number of linear feet (meters) of pipe underdrains in place, completed, and approved; measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types, and sizes shall be measured separately. All fittings, porous backfill and filter fabric shall be included in the footage as typical pipe sections in the pipeline being measured.

### **BASIS OF PAYMENT**

**705-5.1** Payment will be made at the contract unit price per linear foot, (meter) Complete (including fittings, porous backfill and filter fabric) for pipe underdrains of the type, class, and size designated.

These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 705001	6- Inch Perforated Polyethylene Underdrain Pipe, Schedule 40, Complete – per linear foot
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### **MATERIAL REQUIREMENTS**

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C444	Standard Specification for Perforated Concrete Pipe
ASTM C654	Standard Specification for Porous Concrete Pipe
ASTM D2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D3034	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F758	Standard Specification for Smooth Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
AASHTO M190	Standard Specification for Bituminous - Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M288	Standard Specification for Geotextile Specification for Highway Applications

AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500- mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) diameter
AASHTO	Standard Specifications for Highway Bridges

END OF ITEM D-705

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**Item T-901 Seeding**

**DESCRIPTION**

**901-1.1** This item shall consist of soil preparation, seeding and fertilizing the areas shown on the plans or as directed by the Engineer in accordance with these specifications.

**MATERIALS**

**901-2.1 Seed.** The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

<b>Seed</b>	<b>Minimum Seed Purity (Percent)</b>	<b>Minimum Germination (Percent)</b>	<b>Rate of Application lb/acre</b>
Kentucky Blue Grass	98	85	22
Perennial Ryegrass	96	85	44
Hard Fescue	97	85	44
Creeping Red Fescue	97	85	88
Fults Salt Grass	98	85	22

Seeding shall be performed during the period between April 1 and May 20 as well as September 1 to October 5 inclusive, unless otherwise approved by the Engineer.

**901-2.2 Lime.** *Not Applicable*

**901-2.3 Fertilizer.** Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified, and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

- a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;

- b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
- c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be 12-12-12 commercial fertilizer and shall be spread at the rate of 500 lbs per acre.

**901-2.4 Soil for repairs.** The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

## CONSTRUCTION METHODS

**901-3.1 Advance preparation and cleanup.** After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

### **901-3.2 Dry application method.**

**a. Liming.** *Not Applicable*

**b. Fertilizing.** Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

**c. Seeding.** Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

**d. Rolling.** After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

### **901-3.3 Wet application method.**

**a. General.** The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

**b. Spraying equipment.** The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For ease of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

**c. Mixtures.** Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least two (2) weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

**d. Spraying.** Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

**901-3.4 Maintenance of seeded areas.** The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

#### **METHOD OF MEASUREMENT**

**901-4.1** Seeding is incidental to Topsoil Stripping and Restoration

#### **BASIS OF PAYMENT**

**901-5.1** No direct payment will be made for seeding. It shall be incidental to Topsoil Stripping and Restoration.

#### **MATERIAL REQUIREMENTS**

ASTM C602	Standard Specification for Agricultural Liming Materials
ASTM D977	Standard Specification for Emulsified Asphalt
FED SPEC	JJJ-S-181, Federal Specification, Seeds, Agricultural

END OF ITEM T-901

## ITEM T-905 TOPSOILING

### DESCRIPTION

**905-1.1** This item shall consist of preparing the ground surface for topsoil application, removing topsoil from designated stockpiles or areas to be stripped on the site or from approved sources off the site, and placing, spreading and amending the topsoil on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the Engineer.

### MATERIALS

**905-2.1 Topsoil.** Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches (50 mm) or more in diameter), and clay lumps or similar objects. Brush and other vegetation that will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sod and herbaceous growth such as grass and weeds are not to be removed, but shall be thoroughly broken up and intermixed with the soil during handling operations. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means, shall be removed.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

**905-2.2 Inspection and tests.** *Not Applicable*

### CONSTRUCTION METHODS

**905-3.1 General.** Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the Engineer before the various operations are started.

**905-3.2 Preparing the ground surface.** Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the Engineer, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

**905-3.3 Obtaining topsoil.** Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the Engineer. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site, the Contractor shall remove this material from the designated areas and to the depth as directed by the Engineer. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the Engineer. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoiling purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the Engineer. The Contractor shall notify the Engineer sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.

**905-3.4 Placing topsoil.** The topsoil shall be evenly spread on the prepared areas to a uniform depth of 3” inches (50 mm) after compaction, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

After spreading, any large, stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks (2 inches (50 mm) or more in diameter), roots, litter, or any foreign matter shall be raked up and disposed of by the Contractor. After spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the Engineer. The compacted topsoil surface shall conform to the required lines, grades, and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

### **METHOD OF MEASUREMENT**

**905-4.1** Topsoil placement is incidental to Topsoil Stripping and Restoration.

### **BASIS OF PAYMENT**

**905-5.1** No direct payment will be made for topsoiling placement. It shall be incidental to Topsoil Stripping and Restoration.

### **TESTING MATERIALS**

ASTM C117                      Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing

END OF ITEM T-905

## ITEM T-908 MULCHING

### DESCRIPTION

**908-1.1** This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the Engineer.

### MATERIALS

**908-2.1 Mulch material.** Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

**a. Hay.** Hay shall be native hay in an air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile, containing no fertile seed.

**b. Straw.** Straw shall be the stalks from threshed plant residue of oats, wheat, barley, rye, or rice from which grain has been removed. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

**c. Hay mulch containing seed.** Hay mulch shall be mature hay containing viable seed of native grasses or other desirable species stated in the special provisions or as approved by the Engineer. The hay shall be cut and handled so as to preserve the maximum quantity of viable seed. Hay mulch that cannot be hauled and spread immediately after cutting shall be placed in weather-resistant stacks or baled and stored in a dry location until used.

**d. Manufactured mulch.** Cellulose-fiber or wood-pulp mulch shall be products commercially available for use in spray applications.

**e. Asphalt binder.** Asphalt binder material shall conform to the requirements of ASTM D977, Type SS-1 or RS-1.

**908-2.2 Inspection.** The Engineer shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the Engineer and any materials brought on the site that do not meet these standards shall be rejected.

### CONSTRUCTION METHODS

**908-3.1 Mulching.** Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the Engineer. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (1800 - 2700 kg per acre) to provide a loose depth of not less than 1-1/2 inches (38 cm) nor more than 3 inches (75 mm). Other organic material shall be spread at the rate directed by the Engineer. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches (150 mm) or more in

length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than one inch (25 mm) nor more than 2 inches (50 mm).

**908-3.2 Securing mulch.** The mulch shall be held in place by light discing, a very thin covering of topsoil, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the Engineer. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the “peg and string” method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot (1.5-m) centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

**908-3.3 Care and repair.**

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the Engineer, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the Engineer, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the “asphalt spray” method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m), or as directed by the Engineer, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it. Bituminous binder material may be sprayed on the mulched slope areas from either the top or the bottom of the slope. An approved spray nozzle shall be used. The nozzle shall be operated at a distance of not less than 4 feet (1.2 m) from the surface of the mulch and uniform distribution of the bituminous material shall be required. A pump or an air compressor of adequate capacity shall be used to ensure uniform distribution of the bituminous material.

d. If the “asphalt mix” method is used, the mulch shall be applied by blowing, and the asphalt binder material shall be sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m) or as directed by the Engineer, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it.

**METHOD OF MEASUREMENT**

**908-4.1** Mulching is incidental to Topsoil Stripping and Restoration.

**BASIS OF PAYMENT**

**908-5.1** No direct payment will be made for mulching. It shall be incidental to Topsoil Stripping and Restoration.

**MATERIAL REQUIREMENTS**

ASTM D977

Standard Specification for Emulsified Asphalt

END OF ITEM T-908

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UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
<b>COARSE-GRAINED SOIL</b> (more than 50% of material is larger than No. 200 sieve size.)		
Clean Gravel (Less than 5% fines)		
<b>GRAVEL</b> More than 50% of coarse fraction larger than No. 4 sieve size		GW Well-graded gravel; gravel-sand mixtures, little or no fines
		GP Poorly-graded gravel; gravel-sand mixtures, little or no fines
Gravel with fines (More than 12% fines)		
		GM Silty gravel; gravel-sand-silt mixtures
		GC Clayey gravel; gravel-sand-clay mixtures
<b>SAND</b> 50% or more of coarse fraction smaller than No. 4 sieve size		
Clean Sand (Less than 5% fines)		
		SW Well-graded sand; sand-gravel mixtures, little or no fines
		SP Poorly graded sand; sand-gravel mixtures, little or no fines
Sand with fines (More than 12% fines)		
		SM Silty sand; sand-silt-gravel mixtures
		SC Clayey sand; sand-gravel mixtures
<b>FINE-GRAINED SOIL</b> (50% or more of material is smaller than No. 200 sieve size)		
<b>SILT AND CLAY</b> Liquid limit less than 50%		ML Inorganic silt; sandy silt or gravelly silt with slight plasticity
		CL Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		OL Organic silt and organic clay of low plasticity
<b>SILT AND CLAY</b> Liquid limit 50% or greater		MH Inorganic silt of high plasticity, elastic silt
		CH Inorganic clay of high plasticity, fat clay
		OH Organic silt and organic clay of high plasticity
<b>HIGHLY ORGANIC SOIL</b>		PT Peat and other highly organic soil

OTHER MATERIAL SYMBOLS		
		
		
		
		

LABORATORY CLASSIFICATION CRITERIA	
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3
GP	Not meeting all gradation requirements for GW
GM	Atterberg limits below "A" line or PI less than 4
GC	Atterberg limits above "A" line with PI greater than 7
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3
SP	Not meeting all gradation requirements for SW
SM	Atterberg limits below "A" line or PI less than 4
SC	Atterberg limits above "A" line with PI greater than 7

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent.....GW, GP, SW, SP  
More than 12 percent.....GM, GC, SM, SC  
5 to 12 percent.....Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

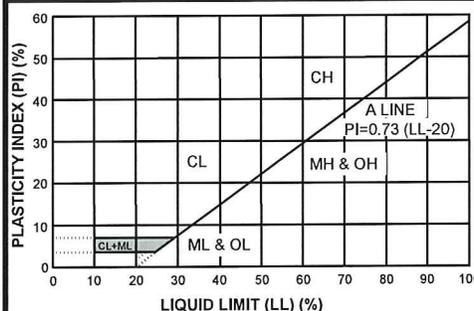
If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)
- GM-GC (CLAYEY SILTY GRAVEL or CLAYEY SILTY GRAVEL with Sand)

### PARTICLE SIZES

Boulders	- Greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel- Coarse	- 3/4 inches to 3 inches
Gravel- Fine	- No. 4 to 3/4 inches
Sand- Coarse	- No. 10 to No. 4
Sand- Medium	- No. 40 to No. 10
Sand- Fine	- No. 200 to No. 40
Silt and Clay	- Less than (0.0074 mm)

### PLASTICITY CHART



VISUAL MANUAL PROCEDURE
When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows: For soils where it is difficult to distinguish if it is a coarse or fine-grained soil: • SC/CL (CLAYEY SAND to SANDY LEAN CLAY) • SM/ML (SILTY SAND to SANDY SILT) • GC/CL (CLAYEY GRAVEL to GRAVELLY LEAN CLAY) • GM/ML (SILTY GRAVEL to GRAVELLY SILT) For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay: • SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand) • SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand) • SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand) • SW/SP (SAND or SAND with Gravel) • GP/GW (GRAVEL or GRAVEL with Sand) • SC/SM (CLAYEY to SILTY SAND) • GM/GC (SILTY to CLAYEY GRAVEL) • CL/ML (SILTY CLAY) • ML/CL (CLAYEY SILT) • CH/MH (FAT CLAY to ELASTIC SILT) • CL/CH (LEAN to FAT CLAY) • MH/ML (ELASTIC SILT to SILT) • OL/OH (ORGANIC SILT or ORGANIC CLAY)

DRILLING AND SAMPLING ABBREVIATIONS	
2ST	- Shelby Tube - 2" O.D.
3ST	- Shelby Tube - 3" O.D.
AS	- Auger Sample
GS	- Grab Sample
LS	- Liner Sample
NR	- No Recovery
PM	- Pressure Meter
RC	- Rock Core diamond bit, NX size, except where noted
SB	- Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	- Vane Shear
WS	- Wash Sample

OTHER ABBREVIATIONS	
WOH	- Weight of Hammer
WOR	- Weight of Rods
SP	- Soil Probe
PID	- Photo Ionization Device
FID	- Flame Ionization Device

DEPOSITIONAL FEATURES	
Parting	- as much as 1/16 inch thick
Seam	- 1/16 inch to 1/2 inch thick
Layer	- 1/2 inch to 12 inches thick
Stratum	- greater than 12 inches thick
Pocket	- deposit of limited lateral extent
Lens	- lenticular deposit
Hardpan/Till	- an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	- soil deposited by lake water
Mottled	- soil irregularly marked with spots of different colors that vary in number and size
Varved	- alternating partings or seams of silt and/or clay
Occasional	- one or less per foot of thickness
Frequent	- more than one per foot of thickness
Interbedded	- strata of soil or beds of rock lying between or alternating with other strata of a different nature

CLASSIFICATION TERMINOLOGY AND CORRELATIONS		
<b>Cohesionless Soils</b>		
<b>Relative Density</b>	<b>N-Value</b> (Blows per foot)	
Very Loose	0 to 4	
Loose	4 to 10	
Medium Dense	10 to 30	
Dense	30 to 50	
Very Dense	50 to 80	
Extremely Dense	Over 80	
<b>Cohesive Soils</b>		
<b>Consistency</b>	<b>N-Value</b> (Blows per foot)	<b>Undrained Shear Strength</b> (Kips/ft <sup>2</sup> )
Very Soft	0 - 2	0.25 or less
Soft	2 - 4	0.25 to 0.50
Medium	4 - 8	0.50 to 1.0
Stiff	8 - 15	1.0 to 2.0
Very Stiff	15 - 30	2.0 to 4.0
Hard	> 30	4.0 or greater
Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted.		



PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

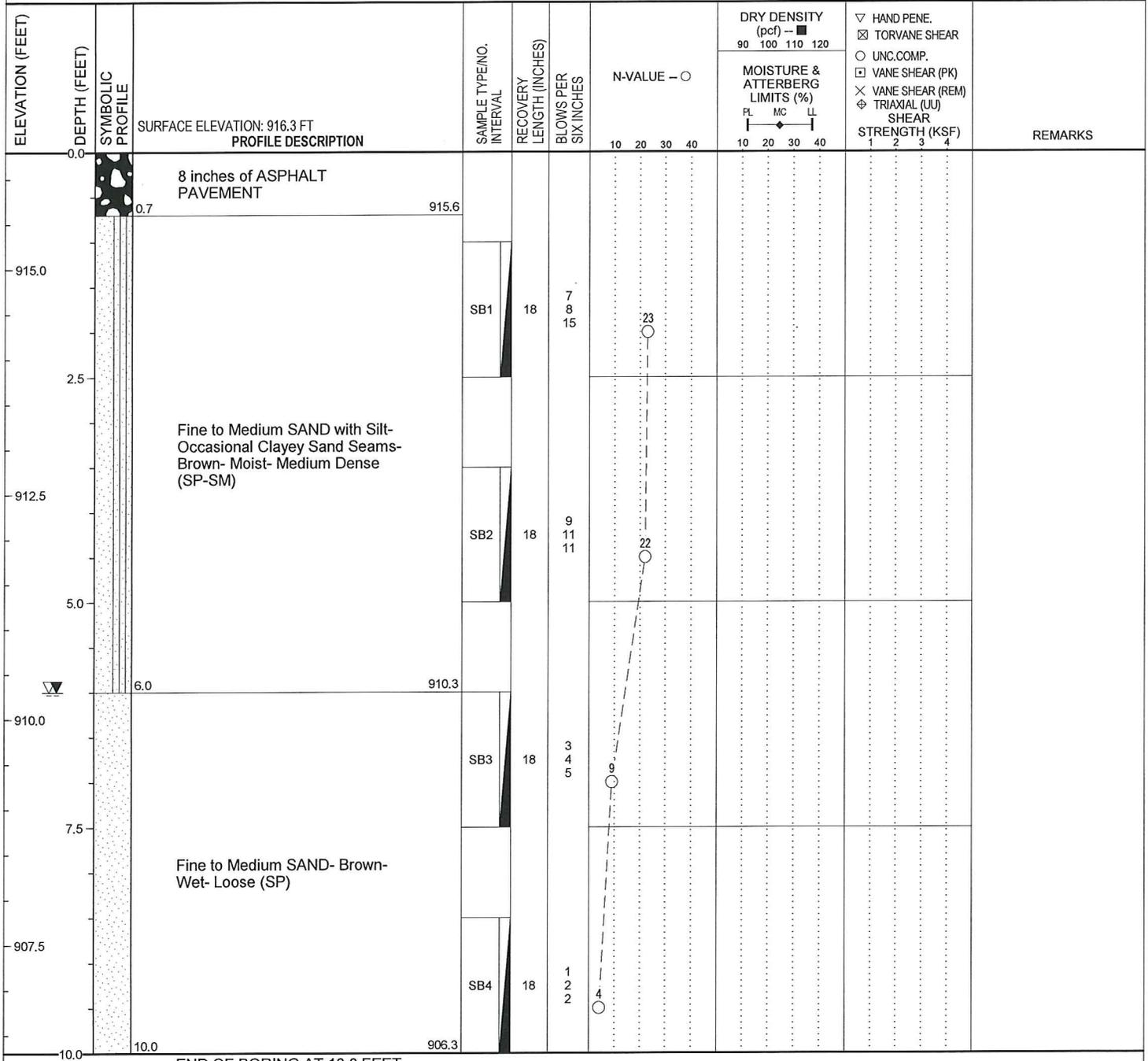
BORING METHOD: Solid-stem Augers

DRILLER: JB

RIG NO.: CME 45B

LOGGED BY: EFG

CHECKED BY: KJG



END OF BORING AT 10.0 FEET.

**GROUNDWATER & BACKFILL INFORMATION**

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	6.0	910.3
▽ AT END OF BORING:	6.0	910.3

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.  
2. Surface capped with asphalt cold patch after backfilling the borehole.



# BORING B2

PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

BORING METHOD: Solid-stem Augers

DRILLER: JB

RIG NO.: CME 45B

LOGGED BY: EFG

CHECKED BY: KJG

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 922.2 FT PROFILE DESCRIPTION	SAMPLE TYPE NO. INTERVAL	RECOVERY LENGTH (INCHES)	BLOWS PER SIX INCHES	N-VALUE - ○	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	▽ HAND PENE. ☒ TORVANE SHEAR ○ UNC.COMP. ☐ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
								90 100 110 120			
922.2	0.0		5 inches of TOPSOIL- Dark Brown	921.8							
920.0	2.5		FILL- Fine SILTY SAND- Occasional Root Fibers- Buried Topsoil Layer at about 7 feet- Dark Brown- Moist to Wet-Medium Dense (SM)	SB1	18	4 5 5	10				
917.5	5.0			SB2	18	4 5 5	10				
915.0	7.5			SB3	18	9 7 7	14	23			A loss-on-ignition (LOI) test performed on Sample SB3 indicates an organic content of about 3.7 percent.
912.5	10.0		Fine to Medium CLAYEY SAND- Occasional Sandy Clay Seams- Brown- Wet- Medium Dense (SC)	913.7	8.5	6 7 11	18				

END OF BORING AT 10.0 FEET.

GROUNDWATER & BACKFILL INFORMATION		
	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	1.0	921.2
▽ AT END OF BORING:	7.0	915.2
BACKFILL METHOD: Auger Cuttings		

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.



PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

BORING METHOD: Hand Auger

FIELD REPRESENTATIVE: AH

EQUIPMENT: Hand Auger

LOGGED BY: JEL

CHECKED BY: KJG

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 933.6 FT PROFILE DESCRIPTION	SAMPLE TYPE NO. INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) - O	DRY DENSITY (pcf) - ■	<input type="checkbox"/> HAND PENE. <input checked="" type="checkbox"/> TORVANE SHEAR <input type="checkbox"/> UNC.COMP. <input checked="" type="checkbox"/> VANE SHEAR (PK) <input checked="" type="checkbox"/> VANE SHEAR (REM) <input checked="" type="checkbox"/> TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
							90 100 110 120		
							MOISTURE & ATTERBERG LIMITS (%)		
							PL MC LL		
932.5	2.5		Fine SILTY to CLAYEY SAND- Occasional Roots- Brown- Moist (SM/SC)	AS1					
930.0	5.0		LEAN CLAY with Sand- Brown- Stiff (CL)	AS2			19		Cobbles encountered from 2.5 feet to 5.0 feet below the ground surface.
			END OF BORING AT 5.0 FEET.						
927.5									
925.0									
10.0									

**GROUNDWATER & BACKFILL INFORMATION**

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.



PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

BORING METHOD: Hand Auger

FIELD REPRESENTATIVE: AH

EQUIPMENT: Hand Auger

LOGGED BY: JEL

CHECKED BY: KJG

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 944.7 FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) - ○	DRY DENSITY (pcf) - ■				MOISTURE & ATTERBERG LIMITS (%)				▽ HAND PENE. ☒ TORVANE SHEAR ○ UNC.COMP. ☐ VANE SHEAR (PK) × VANE SHEAR (REM) ⊕ TRIAXIAL (UJ) SHEAR STRENGTH (KSF)	REMARKS	
							90	100	110	120	PL	MC	LL	1			2
944.7	0.0																
943.7	1.0		Fine SILTY to CLAYEY SAND- Frequent Root Fibers- Brown-Moist (SM/SC)	AS1													Cobbles encountered from 1.0 feet to 3.5 feet below the ground surface.
942.5	2.5		Fine CLAYEY SAND- Brown-Moist (SC)	AS2													
941.2	3.5																
940.0	5.0		Fine SAND with Silt- Brown-Moist (SP-SM)	AS3													
939.2	5.5																
937.5	7.5		Fine SILTY to CLAYEY SAND- Brown- Moist (SM/SC)	AS4													
937.2	7.5																
936.2	8.5		Fine to Medium SAND with Silt- Brown- Moist (SP-SM)	AS5													
			END OF BORING AT 8.5 FEET.														
935.0																	
10.0																	

<b>GROUNDWATER &amp; BACKFILL INFORMATION</b>  GROUNDWATER WAS NOT ENCOUNTERED  <b>BACKFILL METHOD:</b> Auger Cuttings	<b>NOTES:</b> 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
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PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

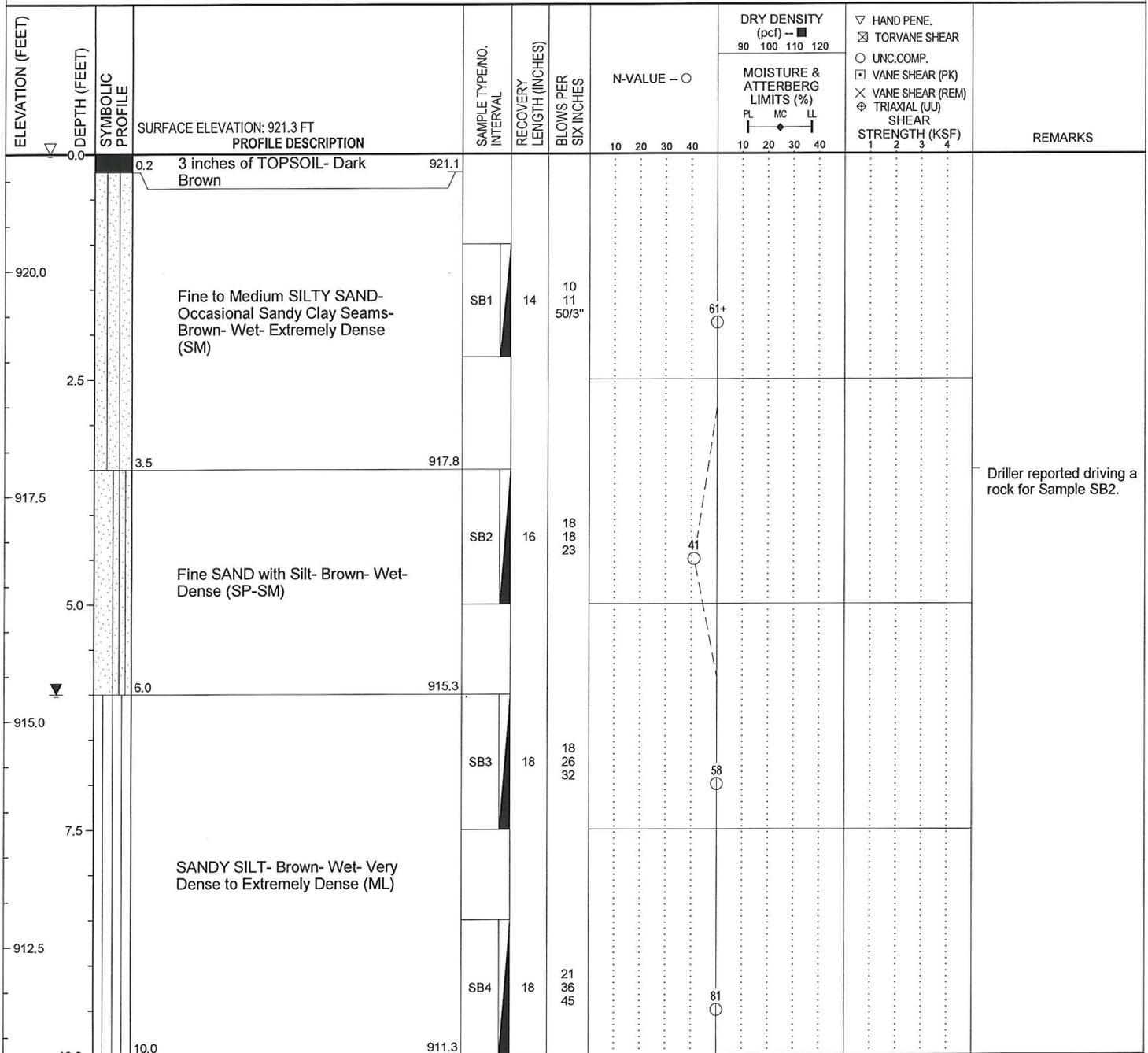
BORING METHOD: Solid-stem Augers

DRILLER: JB

RIG NO.: CME 45B

LOGGED BY: EFG

CHECKED BY: KJG



END OF BORING AT 10.0 FEET.

GROUNDWATER & BACKFILL INFORMATION		
	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	0.0	921.3
▽ AT END OF BORING:	6.0	915.3
BACKFILL METHOD: Auger Cuttings		

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.



# BORING B6

PAGE 1 OF 1

PROJECT NAME: Buckner Road Extension

PROJECT NUMBER: 079043.00

CLIENT: OHM Advisors

PROJECT LOCATION: Battle Creek, Michigan

DATE STARTED: 5/23/18

COMPLETED: 5/23/18

BORING METHOD: Hand Auger

FIELD REPRESENTATIVE: AH

EQUIPMENT: Hand Auger

LOGGED BY: JEL

CHECKED BY: KJG

ELEVATION (FEET)	DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: 930 FT PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) - ○	DRY DENSITY (pcf) - ■	MOISTURE & ATTERBERG LIMITS (%)	<input type="checkbox"/> HAND PENE. <input checked="" type="checkbox"/> TORVANE SHEAR <input type="checkbox"/> UNC.COMP. <input type="checkbox"/> VANE SHEAR (PK) <input type="checkbox"/> VANE SHEAR (REM) <input type="checkbox"/> TRIAXIAL (UU) SHEAR STRENGTH (KSF)	REMARKS
							90 100 110 120			
930.0	0.0									
	0.5		Fine SILTY to CLAYEY SAND- Frequent Root Fibers- Brown- Moist (SM/SC)	AS1						Cobbles encountered from 0.5 feet to 7.5 feet below the existing ground surface.
	2.5		Fine SILTY SAND- Occasional Root Fibers- Brown- Moist (SM)	AS2						
	3.5									
	5.0		Fine to Medium SILTY SAND with Gravel- Brown- Moist (SM)	AS3						
	7.5		END OF BORING AT 7.5 FEET.							
922.5	7.5									
920.0	10.0									

<b>GROUNDWATER &amp; BACKFILL INFORMATION</b>
GROUNDWATER WAS NOT ENCOUNTERED
BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.