Wayne State University

Freer Ground Water Infiltration 2014

WSU Project Number 511-228377

Prevailing Wage Work

FOR:
Board of Governors
Wayne State University
Detroit, Michigan

Owner’s Agent:
Kimberly Tomaszewski, Senior Buyer
WSU – Procurement & Strategic Sourcing
5700 Cass, Suite 4200
Detroit, Michigan 48202
313-577-3757 / 313-577-3747 fax
ac9934@wayne.edu and copy rfpteam1@wayne.edu

Owner’s Representative:
Nancy Milstein, Project Manager
Facilities Planning & Management
Design & Construction Services
5454 Cass
Wayne State University
Detroit, Michigan 48202

Consultant:
Grissim Metz Andriese
300 Cady Street
Northville MI 48167

January 16, 2015
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INFORMATION FOR BIDDERS

OWNER: Board of Governors
Wayne State University

PROJECT: Freer Ground Water Infiltration 2014
Project No. 511-228377

LOCATION: Wayne State University
71 East Ferry
Detroit, Michigan 48202

OWNER’S AGENT: Kimberly Tomaszewski, Senior Buyer
WSU – Procurement & Strategic Sourcing
5700 Cass, Suite 4200
Detroit, Michigan 48202
313-577-3757 / 313-577-3747 fax
ac9934@wayne.edu & copy rfpteam1@wayne.edu

OWNER’S REPRESENTATIVE: Nancy Milstein, Project Manager
Facilities Planning & Management
Design & Construction Services
Wayne State University
5454 Cass Avenue
Detroit, Michigan 48202

Architect: Grissim Metz Andriese
300 Cady Street
Northville MI 48167

SPECIAL NOTE: Right to reject any and all proposals, either in whole or in part and to waive any irregularities therein is reserved by the Owner.

BIDS ADVERTISED: January 16, 2015

BIDDING: Bidding documents may be obtained by vendors from the University Purchasing Web Site at http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html beginning January 16, 2015. When visiting the Web Site, click on the "Construction" link in green. Copies of the RFP will not be available at the pre-proposal meeting.

MANDATORY Pre-Bid Conference: 2:00 p.m., local time, January 22, 2015 to be held at Wayne State University – 5454 Cass Avenue, Conference Room 2, Detroit, MI, 48202. Late Arrivals may not be permitted to submit bids.

OPTIONAL Second Walk Through: (if needed) To be determined at the conclusion of the pre-bid conference, by those in attendance.

DUE DATE FOR QUESTIONS: Due Date for questions shall be January 28, 2015 at 12:00 Noon. All questions must be reduced to writing and emailed to the attention of Kimberly Tomaszewski, Senior Buyer at ac9934@wayne.edu, copy to Robin Ellis-Watkins, Buyer at: rfpteam1@wayne.edu.

Bids Due: Sealed proposals for lump-sum General Contract will be received at the office of the Procurement & Strategic Sourcing located at 5700 Cass Avenue, Suite 4200, Detroit, MI 48202 on February 5, 2015, until 2:00 p.m. (local time).

No public bid opening will be held.

Bid Qualification Meeting: Bidders must be available for bid prequalification meeting the day following the bid opening. The lowest qualified bidder will be contacted and requested to meet with Facilities Planning & Management at their office located at 5454 Cass Avenue, Detroit, MI 48202. During the prequalification, the Vendor must provide a Project Schedule and a Schedule of Values, including a list of Contractor’s suppliers, subcontractors and other
An unsigned contract will be given to the successful Contractor at the conclusion of the Pre Award meeting, if all aspects of the bid are in order. The Contractor has 5 business days to return the contract to the Project Manager for University counter signature. The contractor must also submit a Performance Bond as outlined above and a Certificate of Insurance in the same 5 business day period. In the event the Contractor fails to return the documents in this 5 day period, the University reserves the right to award the contract to the next most responsive bidder.

All available information pertaining to this project will be posted to the Purchasing web site at http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html. Information that is not posted to the website is not available/not known.
INSTRUCTIONS TO BIDDERS

OWNER: Board of Governors
Wayne State University

PROJECT: Freer Ground Water Infiltration 2014
Project No. 511-228377

LOCATION: Wayne State University
71 East Ferry
Detroit, Michigan 48202

OWNER’S AGENT: Kimberly Tomaszewski, Senior Buyer
WSU – Procurement & Strategic Sourcing
5700 Cass, Suite 4200
Detroit, Michigan 48202
313-577-3757 / 313-577-3747 fax
ac9934@wayne.edu & copy rfpteam1@wayne.edu

1. PROPOSALS

A. The Purchasing Agent will receive sealed Proposals for the work as herein set forth at the place and until the time as stated in the "Information for Bidders", a copy of which is bound herewith in theses specifications. No public bid opening will be held.

B. Proposals shall be for a lump-sum General Contract for the entire work of the Project as provided in the Form of Proposal.

C. Proposals shall be submitted in duplicate on forms furnished with the Bidding documents. The forms must be fully filled out in ink or typewritten with the signature in longhand, and the completed forms shall be without alterations, interlineations, or erasures. Forms shall contain no recapitulations of the work to be done. Each proposal shall be delivered in an opaque sealed envelope, marked "PROPOSAL" AND SHALL BEAR THE NAME OF THE PROJECT AND THE NAME OF THE BIDDER. Proposals submitted by telephone or telegraph will not be accepted. Modifications by telephone or telegraph to previously submitted proposals will not be accepted.

D. All base bids must be conforming to the detailed specifications and drawings provided by the University, including any Addenda issued. Voluntary Alternates will only be considered if the Contractor has also submitted a conforming base bid. Any stipulation of voluntary alternates or qualifications contrary to the Contract requirements made by the Bidder in or accompanying his proposal as a condition for the acceptance of the Contract will not be considered in the award of the Contract and will cause the rejection of the entire Proposal.

E. The competency and responsibility of Bidders will be considered in making the award. The Owner does not obligate himself to accept the lowest or any other bids. The Owner reserves the right to reject any and all bids and to waive any informalities in the Proposals.

2. PROPOSAL GUARANTEE (revised 3-22-2012)

A. A certified check or bank draft payable to the Owner, or satisfactory Bid Bond executed by the Bidder and Surety Company, in an amount equal to not less than five percent (5%) of the maximum proposal amount shall be submitted with each Proposal, which amount may be forfeited to the Board of Governors, Wayne State University, if the successful Bidder refuses to enter into a Contract within ninety (90) days from receipt of Proposals.

B. Bond must be issued by a Surety Company with an “A rating as denoted in the AM Best Key Rating Guide”
C. The bid deposit of all bidders except the lowest three will be returned within three (3) days after the bids are opened. After the formal Contract and bonds are approved, the bid deposit will be returned to the lowest three bidders, except when forfeited.

D. Bid bonds shall be accompanied by a Power of Attorney authorizing the signer of the bond to do so on behalf of the Surety Company.

E. Withdrawal of Proposals is prohibited for a period of ninety (90) days after the actual date of opening thereof.

3. CONTRACT SECURITY (revised 3-22-2012)

A. The successful Bidder will be required to furnish a Performance Bond and Labor and Material Payment bond in an amount equal to 100% of the contract award amount, and include such cost in the Proposal, complying with the laws of the State of Michigan. The graduated formula no longer applies.

B. Performance Bond and Labor and Material Payment Bond shall be from a surety company acceptable to the Owner and made payable as follows:

(1) A bond for 100% of the contract award amount to the Board of Governors of Wayne State University, and guaranteeing the payment of all subcontractors and all indebtedness incurred for labor, materials, or any cause whatsoever on account of the Contractor in accordance with the laws of the State of Michigan relating to such bonds.

(2) A bond for 100% of the contract award amount to the Board of Governors of Wayne State University to guarantee and insure the completion of work according to the Contract.

C. The only acceptable Performance Bond shall be the AIA A312 – 2010.

D. Bond must be issued by a Surety Company with an “A rating as denoted in the AM Best Key Rating Guide”.

4. BOND CLARIFICATION

For bids below $50,000.00,

A. Bid bond will not be required.

B. Performance Bond will not be required.

5. INSPECTION

A. Before submitting his Proposal, each Bidder shall be held to have visited the site of the proposed work and to have familiarized himself as to all existing conditions affecting the execution of the work in accordance with the Contract Documents. No allowance or extra consideration on behalf of the Contractor will subsequently be made by reason of his failure to observe the Conditions or on behalf of any subcontractor for the same reason.

6. EXPLANATION TO BIDDERS AND ADDENDA

A. Neither the Owner nor Representative nor Purchasing Agent will give verbal answers to any inquiries regarding the meaning of drawings and specifications, and any verbal statement regarding same by any person, previous to the award, shall be unauthoritative.

B. Any explanation desired by Bidders must be requested of the Purchasing Agent in writing, and if explanation is necessary, a reply will be made in the form of an Addendum, a copy of which will be forwarded to each Bidder registered on the Bidders’ List maintained by Procurement & Strategic Sourcing.
C. All addenda issued to Bidders prior to date of receipt of Proposals shall become a part of these Specifications, and all proposals are to include the work therein described.

7. **INTERPRETATION OF CONTRACT DOCUMENTS**

A. If any person contemplating submitting a bid for the proposed Contract is in doubt as to the true meaning of any part of the drawings, specifications, or other Contract Documents, he may submit to the Purchasing Agent, a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the Contract Documents will be made by an addendum duly issued. A copy of such addendum will be mailed and delivered to each registered Bidder. Each proposal submitted shall list all addenda, by numbers, which have been received prior to the time scheduled for receipt of proposal.

8. **SUBSTITUTION OF MATERIALS AND EQUIPMENT**

A. Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided that the material, article, or piece of equipment so proposed is, in the opinion of the Architect, of equal substance, appearance and function. It shall not be purchased or installed by the Contractor without the Architect's written approval.

9. **TAXES**

A. The Bidder shall include in his lump sum proposal and make payment of all Federal, State, County and Municipal taxes, including Michigan State Sales and Use Taxes, now in force or which may be enacted during the progress and completion of the work covered.

10. **REQUIREMENTS FOR SIGNING PROPOSALS AND CONTRACTS**

A. The following requirements must be observed in the signing of proposals that are submitted:

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

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

3. Proposals that are signed for a corporation shall have the correct corporate name thereof and the signature of the President or other authorized officer of the corporation, manually written in the line of the Form of Proposal following the words “signed by”. If such a proposal is signed by an official other than the President of the Corporation, a certified copy of resolution of the Board of Directors, evidencing the authority of such official to sign the bid, shall be attached to it. Such proposal shall also bear the attesting signature of the Secretary of the Corporation and the impression of the corporate seal.

11. **QUALIFICATIONS OF BIDDERS**

A. The Owner may request each of the three (3) low bidders to submit information necessary to satisfy the Owner that the Bidder is adequately prepared to fulfill the Contract. Such information may include past performance records, list of available personnel, plant and equipment, description of work that will be done simultaneously with the Owner's Project, financial statement, or any other pertinent information. This information and such other information as may be requested will be used in determining whether a Bidder is qualified to perform the work required and is responsible and reliable.
12. **SPECIAL REQUIREMENTS**

A. The attention of all Bidders is called to the General Conditions, Supplementary General Conditions, and Special Conditions, of which all are a part of the Specifications covering all work, including Subcontracts, materials, etc. Special attention is called to those portions dealing with Labor Standards, including wages, fringe benefits, Equal Employment Opportunities, and Liquidated Damages.

B. Prior to award of the project, the apparent low bidder will be required to produce a schedule of values which will include the proposed subcontractors for each division of work and whether the subcontractor is signatory or non-signatory. A contract will not be issued to the apparent low bidder until this document is provided. A contractor will have one week to produce this document. If the required document is not received within this time, the bidder will be disqualified.


A. The Proposal shall be deemed as having been accepted when a copy of the Contract (fully executed by both the vendor and the appropriate signatory authority for the University), with any/all Alternates, Addenda, and Pre-Contract Bulletins, as issued by the office or agent of the Owner has been duly received by the Contractor. After signing the Contracts, the Contractor shall then return all copies, plus any required bonds and certificates of insurance, to the office of the Owner's Representative, at 5454 Cass, Wayne State University, Detroit, MI 48202. Construction will begin when the fully-executed contract has been returned to the Contractor.

14. **TIME OF STARTING AND COMPLETION**

A. It is understood that the work is to be carried through to substantial completion with the utmost speed consistent with good workmanship and to meet the established start and completion dates.

B. The Contractor shall begin work under the Contract without delay, upon receipt of a fully-executed contract from the Owner, and shall substantially complete the project ready for unobstructed occupancy and use of the Owner for the purposes intended within the completion time stated in the Contract.

C. The Contractor shall, immediately upon receipt of fully-executed contract, schedule his work and expedite deliveries of materials and performance of the subcontractors to maintain the necessary pace for start and completion on the aforementioned dates.

15. **BIDDING DOCUMENTS**

A. Bid specifications are not available at the University, but are available beginning January 16, 2015 through Wayne State University Procurement & Strategic Sourcing’s Website for Advertised Bids: http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html. The plans for this project can be viewed in advance and/or printed from the above website. Copies of the RFP will not be available at the pre-proposal meeting.

B. **DOCUMENTS ON FILE (revised 12-2007)**

1. Wayne State University Procurement & Strategic Sourcing’s Website.
   All available information pertaining to this project will be posted to the Purchasing web site at http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html. Information that is not posted to the website is not available/not known.

2. Notification of this Bid Opportunity has been sent to DUNN BLUE (for purchase of Bid Documents only), DODGE REPORTS, REED CONSTRUCTION, CONSTRUCTION NEWS and the CONSTRUCTION ASSOCIATION OF MICHIGAN (CAM).

3. Please note: Effective December 1, 2007, bid notices will be sent only to those Vendors registered to receive them via our Bid Opportunities list serve. To register, to
http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html, and click on the “Join our Listserv” link at the top of the page.
NOTICE OF MANDATORY PRE-BID CONFERENCE

PROJECT: Freer Ground Water Infiltration 2014,

PROJECT NOS.: WSU PROJECT NO. 511-228377

It is MANDATORY that each Contractor proposing to bid on this work must attend a pre-bid conference at the following location:

Wayne State University
5454 Cass Avenue, Conference Room 2
Detroit MI 48202

2:00 p.m., local time, January 22, 2015

The purpose of this conference is to clarify the procedures, scope of work, and to identify any omissions and/or inconsistencies that may impede preparation and submission of representative competitive bids.

An attendance list shall be prepared and minutes of the conference shall be furnished to all those attending.

Any clarifications or corrections that cannot be made at the conference will be by Addendum.

For your convenience a map of the University and appropriate parking lots can be downloaded and printed from: http://campusmap.wayne.edu. Guest parking in any of the University student and guest lots is $7.00. A detailed list of Cash & Coin operated lots can be viewed at http://purchasing.wayne.edu/cash_and_credit_card_lots.php. Cash lots dispense change in quarters. Due to time constraints, Vendors are encouraged to avoid parking at meters on the street (especially blue “handicapped” meters).

All available information pertaining to this project will be posted to the Purchasing web site at http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html. Information that is not posted to the website is not available/not known.
AGENDA

I. Welcome and Introductions
   A. Wayne State University Representatives
   B. Vendor Representatives
   C. Sign in Sheet- be sure to include your fax number and email address (LEGIBLY) on the sign in sheet.

II. Brief Overview of Wayne State University
   A. Purpose and Intent of RFP.
   B. Detailed review of the RFP and the requirements for a qualified response.
   C. Review of all pertinent dates and forms that are REQUIRED for a qualified response.

III. Vendor Questions/Concerns/Issues
   A. Questions that can be answered directly by the appropriate person in this meeting will be answered and both question and answer will be recorded in the minutes of the meeting.
   B. Questions that need to be researched will be answered and a nature of clarification will be emailed to the appropriate ListServ. See http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_Bid_Listserve.html for a list of ListServ Bid Lists.
   C. Minutes will be emailed to all participants of the meeting within a reasonable amount of time. (be sure to include your email address/addresses on the sign in sheet)
   D. Questions and concerns that come up after this meeting are to be addressed to Kimberly Tomaszewski, Procurement & Strategic Sourcing. Discussion with other University members is seriously discouraged and could lead to disqualification from further consideration. All questions and answers will be recorded and emailed to all participants of the RFP.
   E. Due date for questions is January 28, 2015, 12:00 noon.

IV. Proposal Due Date- February 5, 2015, 2:00 p.m.

V. Final Comments

VI. Adjourn
Please Note – Vendors must Pre-qualify themselves when responding to this bid opportunity. Our Prequalification questions can be found on page 4 of this section.

OWNER: Board of Governors
Wayne State University

PROJECT: Freer Ground Water Infiltration 2014

PROJECT NO.: WSU PROJECT NO. 511-228377

PROJECT TYPE: Construction Type
Exterior excavation, foundation repair, landscaping Work

PURCHASING AGENT: Kimberly Tomaszewski, Senior Buyer
WSU – Procurement & Strategic Sourcing
5700 Cass, Suite 4200
Detroit, Michigan 48202
313-577-3757/ 313-577-3747 fax
ac9934@wayne.edu & copy rfpteam1@wayne.edu

OWNER'S REPRESENTATIVE: Nancy Milstein, Project Manager
Design & Construction Services
Facilities Planning & Management
Wayne State University
5454 Cass Avenue
Detroit, Michigan 48202

TO: Board of Governors
Wayne State University
Detroit, Michigan

BASE PROPOSAL: The undersigned agrees to enter into an Agreement to complete the entire work of the Freer Ground Water Infiltration 2014 project (WSU Project No. 511-228377) in accordance with the Bidding Documents for the following amounts:

1. Water infiltration/ dampproofing scope $ Dollars

2. Landscape scope $ Dolphins

ALTERNATES: The following alternates to the base proposal(s) are required to be offered by the respective bidder. The undersigned agrees that the following amounts will be added to or deducted from the base bid as indicated, for each alternate which is accepted.

ALTERNATE NO. 1: New Fence & Gate at Areaway
Demolition of existing gate and fence at area way. Fabrication and installation of new fence and gate per plan and details refer to detail #9, sheet A101. The undersigned agrees to enter into an agreement to complete the Alternate # 1 work (a fence) of the Freer Ground Water Infiltration 2014 project and to provide all labor and material associated with the work in accordance with the Bidding Documents for the following amounts:
UNIT PRICES

<table>
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<th>Description</th>
<th>Material cost</th>
<th>Installed cost</th>
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<tr>
<td>Unit Price 1</td>
<td>Flagstone paving complete (refer to spec section 321440.14)</td>
<td>$ / sq ft</td>
<td>$ / sq ft</td>
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<tr>
<td>Unit Price 2</td>
<td>Asphalt concrete paving complete (refer to spec section 321216)</td>
<td>$ / sq ft</td>
<td>$ / sq ft</td>
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<tr>
<td>Unit Price 3</td>
<td>Exposed aggregate concrete paving complete (refer to spec section 321313.13)</td>
<td>$ / sq ft</td>
<td>$ / sq ft</td>
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<tr>
<td>Unit Price 4</td>
<td>Steel ornamental picket fencing and gates complete (refer to spec section 323119)</td>
<td>$ / linear ft</td>
<td>$ / linear ft</td>
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<tr>
<td>Unit Price 5</td>
<td>Mulch complete (refer to spec section 329300)</td>
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<tr>
<td>Unit Price 6</td>
<td>Sodding complete (refer to spec section 329223)</td>
<td>$ /sy</td>
<td>$ /sy</td>
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<tr>
<td>Unit Price 7</td>
<td>Steel edging complete (refer to spec section 329300)</td>
<td>$ / linear ft</td>
<td>$ / linear ft</td>
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<tr>
<td>Unit Price 8</td>
<td>Plant mix complete (refer to spec section 329300)</td>
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LAWN REPLACEMENT:
The undersigned agrees that, in the event of existing lawn or landscaping damage, due to the Contractor's work, that has not been properly addressed and repaired to the satisfaction of the University, the University may repair/replace the lawn and/or landscaping, and that the expense will be at a unit cost of $10.00 per square yard for lawn, and landscaping at a rate of 1.5 times the cost of said repairs, the full cost of which shall be reimbursed by the contractor.

CONTRACT CHANGE ORDERS: (revised 4-01-2011)
The undersigned agrees to the following pricing formula and rates for changes in the contract work:

1. For subcontract work, Contractor's markup for handling, overhead, profit and bonding on subcontractors sell price, shall not exceed 5%.
   1.1. For subcontract work that is provided on a time and material basis, the subcontractor shall be permitted a single markup for handling, overhead, profit and bonding of 5%. When a markup is identified in the subcontractor's hourly labor rate, additional markup on labor is not permitted.
      1.1.1 For changes that are based upon a lump sum value, subcontractor shall provide all labor and material back-ups to
ensure that duplicative charges are avoided and authorized mark-ups for OH&P can be confirmed

2. For work by his own organization, Contractor's markup for job* and general overhead, profit and bonding shall not exceed 5% of the net labor** and material costs.

Within 14 days of the project's contract execution Contractor shall provide to the Owner; Subcontractor's hourly labor rate breakdown details. This requirement shall extend to the lowest level of subcontractor participation.

* Job and general overhead includes supervision and executive expenses; use charges on small tools, scaffolding, blocking, shores, appliances, etc., and other miscellaneous job expenses.

** Net labor cost is the sum of the base wages, fringe benefits established by governing trade organizations, applicable payroll taxes, and increased expense for contractor's liability insurance (Workman's Compensation, P.L. and P.D.).

TIME OF COMPLETION: (revised 4-01-2011)
The Contract is expected to be fully executed on or about 25 calendar days after successful bidder qualification and recommendation of award. The undersigned agrees to start construction immediately after receipt of a fully executed contract, and to complete the work as follows:

Substantial Completion will be completed no later than August 31, 2015.

LIQUIDATED DAMAGES:
It is understood and agreed that, if project is not completed within the time specified in the contract plus any extension of time allowed pursuant thereto, the actual damages sustained by the Owner because of any such delay, will be uncertain and difficult to ascertain, and it is agreed that the reasonable foreseeable value of the use of said project by Owner would be the sum of $500.00, five hundred dollars per day, and therefore the contractor shall pay as liquidated damages to the Owner the sum of $500.00, five hundred dollars per day for each day's delay in substantially completing said project beyond the time specified in the Contract and any extensions of time allowed thereunder.

TAXES:
The undersigned acknowledges that prices stated above include all applicable taxes of whatever character or description. Michigan State Sales Tax is applicable to the work. Bidder understands that the Owner reserves the right to reject any or all bids and to waive informalities or irregularities therein.

ADDENDA:
The undersigned affirms that the cost of all work covered by the following Addenda are included in the lump sum price of this proposal.

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<th>Addendum No.</th>
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CONTRACTOR'S PREQUALIFICATION STATEMENT & QUESTIONNAIRE:

Our Minimum Requirements for Construction Bids are:

WSU considers this project: Construction Type
Exterior excavation, foundation repair, landscaping Work.
Contractors must complete the following information to determine their eligibility to participate in this bid. This information is required with your Bid to the University.

Failure to complete this form in its entirety will result in your bid being disqualified.

Check one of the following on the makeup of your company:

- Corporation
- Individual
- Partnership
- Joint Venture
- Other (Explain)

** Withdrawal of a bid is subject to the University suspension policy, for a period up to one year.

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<tr>
<th>Criteria</th>
<th>Small Project bid less than $50,000</th>
<th>Medium Project bid between $50,001 and $250,000</th>
<th>Large Project bid between $250,001 and $2 million</th>
<th>Very Large Project bid greater than $2 million</th>
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<tr>
<td>EMR Rating (Experience Modification Rating)</td>
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<td>1.0 or Less</td>
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<td>Length of Time in Construction Business</td>
<td>2 Years</td>
<td>3 Years</td>
<td>5 Years</td>
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<tr>
<td>Demonstrated Experience in Projects</td>
<td>1 or more</td>
<td>1 or more</td>
<td>2 or more</td>
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<td>Dem similar in Scope and Price in the last 3 years</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Unsuccessful Projects on Campus in last 3 years</td>
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<td>None Allowed</td>
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<tr>
<td>Failure to comply with Prevailing Wage and/or Project Labor requirements</td>
<td>None Allowed</td>
<td>None Allowed</td>
<td>None Allowed</td>
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<tr>
<td>Withdrawn University Bid (with or without Bond forfeiture) within the last 3 years **</td>
<td>1 or less</td>
<td>1 or less</td>
<td>1 or less</td>
<td>1 or less</td>
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<tr>
<td>Company currently not in Chapter 11 of the US Bankruptcy Code</td>
<td>1 Year</td>
<td>2 Years</td>
<td>3 Years</td>
<td>3 Years</td>
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</tbody>
</table>

1. How many years has your organization been in business as a contractor? __________________
2. How many years has your organization been in business under its present business name? ________
3. List states in which your organization is legally qualified to do business. __________________

4. Provide the Name and Address of your Liability Insurance Carrier. ________________________
5. What is your current EMR Rating? __________
   The minimum requirement is an EMR Rating of 1.0 or less for all projects. Bidders with a rating higher than 1.0 understand that their bid may be disqualified, at the sole discretion of the University.

6. What percentage of work performed on projects are by company employees; excluding any hired subcontracting and outsourced relationships, for the bid submitted? _______ %

7. What percentage of work performed on your companies behalf are by subcontracted business relationships; disallowing 1099 contracting work forces, for the bid submitted? _______ %

8. Have you ever failed to complete any work awarded to you? If so, attach a separate sheet of explanation. Include the name of the Project, the customer, the dates of the work, and the amount of the contract?

9. Have you withdrawn a bid after a University bid opening and/or refused to enter into a contract with the University upon notification of award within the last 3 years? If so, state the Project Name and Number, and the date of bid submission below.

10. Has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a construction contract? If so, attach a separate sheet of explanation.

11. List the construction experience of the principals and superintendents of your company.

   Name: ____________________________ Title: ____________________________
   ______________________________________________________________________

   Name: ____________________________ Title: ____________________________
   ______________________________________________________________________

   Name: ____________________________ Title: ____________________________
   ______________________________________________________________________

12. List the construction Projects, and approximate dates, when you performed work similar in Scope to this project.

   Project: ____________________________ Owner: ____________________________
   Contract Amount: ______________________ Date Completed: ______________________

   Project: ____________________________ Owner: ____________________________
   Contract Amount: ______________________ Date Completed: ______________________

   Project: ____________________________ Owner: ____________________________
   Contract Amount: ______________________ Date Completed: ______________________
13. List the construction Projects, and approximate dates, when you performed work similar in Dollar Amount to this project.

Project: ___________________________  Owner: ___________________________
Contract Amount: ___________________________  Date Completed: ___________________________

Project: ___________________________  Owner: ___________________________
Contract Amount: ___________________________  Date Completed: ___________________________

Project: ___________________________  Owner: ___________________________
Contract Amount: ___________________________  Date Completed: ___________________________

14. Is your Company “bondable”?  
Yes _____  No _____

15. What is your present bonding capacity?  $ ___________________________

16. Who is your bonding agent?

NAME: ___________________________
ADDRESS: ___________________________
PHONE: (_______) ___________________________
CONTACT: ___________________________

17. Does your company agree to provide financial reports to the University upon request?  Failure to agree may result in disqualification of your bid.  
Yes _____  No _____

18. Does your company agree that all of the Terms and Conditions of this RFP and Vendor’s Response Proposal become part of any ensuing agreement?  
Yes _____  No _____

19. Does your company agree to execute a contract containing the clauses shown in Section 00500 “Agreement Between Contractor and Owner for Construction”?  
Yes _____  No _____

If “No”, clearly note any exceptions to any information contained in the contract documents and include with your proposal.

20. Did your company quote based upon Prevailing Wage Rates?  
Yes _____  No _____

Note: Contractors submitting proposals for this project may, at the discretion of the University, be required to submit references including contact information to be used to assist in the post bid evaluation process for the subject project.

ACKNOWLEDGEMENT OF MINIMUM QUALIFICATIONS:  The undersigned has read and understands the minimum qualifications for University construction projects, and has completed the Prequalification section completely and accurately. The undersigned understands that a contractor, who fails to meet the minimum qualifications in the category identified for this project, will be disqualified from consideration for the project.

ACCEPTANCE OF PROPOSAL:  The undersigned agrees to execute a Contract, being the Wayne State University standard form titled "Agreement Between Contractor and Owner for Construction" (see section 00500 of the bid documents), provided that we are notified of the acceptance of our Proposal within sixty (60) days of the date set for the opening thereof.

The undersigned below understands that the bid will be disqualified if the Prequalification information above is not completed in its entirety.
NAME OF COMPANY: ____________________________________________

OFFICE ADDRESS: ____________________________________________

PHONE NUMBER: ___________________ DATE ____________

FAX NUMBER: ____________________________________________

SIGNED BY: _______________________________________________

Signature

(Please print or type name here)

TITLE

__________________________________________________________

EMAIL ADDRESS: __________________________________________

@
PREVAILING WAGE RATE SCHEDULE (revised 4-05-2010)

A. See also Page 00100-4 Section 12.B

B. Wayne State University requires all project contractors, including subcontractors, who provide labor on University projects to compensate at a rate no less than prevailing wage rates.

C. The rates of wages and fringe benefits to be paid to each class of laborers and mechanics by each VENDOR and subcontractor(s) (if any) shall be not less than the wage and fringe benefit rates prevailing in Wayne County, Michigan, as determined by the United States Secretary of Labor. Individually contracted labor commonly referred to as “1099 Workers” and subcontractors using 1099 workers are not acceptable for work related to this project.

D. To maintain compliance with State of Michigan Ordinances, Certified Payroll must be provided for each of the contractor’s or subcontractor’s payroll periods for work performed on this project. Certified Payroll should accompany all Pay Applications. Failure to provide certified payroll will constitute breach of contract, and pay applications will be returned unpaid, and remain so until satisfactory supporting documents are provided.

A Prevailing Wage Rate Schedule has been issued from the State of Michigan that is enclosed in this section. Additional information can be found on the University Procurement & Strategic Sourcing’s web site at the following URL address:

http://purchasing.wayne.edu/vendors/wage-rates.php

If you have any questions, or require rates for additional classifications, please contact:

Michigan Department of Consumer & Industry Services, Bureau of Safety and Regulation, Wage and Hour Division, 7150 Harris Drive, P.O. Box 30476, Lansing, Michigan 48909-7976

http://www.michigan.gov/dleg/0,1607,7-154-27673_27706---,00.html

F. Wayne State University’s Prevailing Wage Requirements:

When compensation will be paid under prevailing wage requirements, the University shall require the following:

A. The contractor shall obtain and keep posted on the work site, in a conspicuous place, a copy of all current prevailing wage and fringe benefit rates.

B. The contractor shall obtain and keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each laborer and mechanic employed in connection with this contract.

C. The contractor shall submit a completed certified payroll document [U.S. Department of Labor Form WH 347] verifying and confirming the prevailing wage and benefits rates for all employees and subcontractors for each payroll period for work performed on this project. The contractor shall include copies of pay stubs for all employee or contract labor payments related to Wayne State University work. The certified payroll form can be downloaded from the Department of Labor website at http://www.dol.gov/whd/forms/wh347.pdf.

D. A properly executed sworn statement is required from all tiers of contractors, sub-contractors and suppliers which provide services or product of $1,000.00 or greater. Sworn statements must accompany applications for payment. All listed parties on a sworn statement and as a subcontractor must submit Partial or Full Conditional Waivers for the amounts invoiced on the payment application. A copy of the acceptable WSU Sworn Statement and Waiver will be provided to the awarded contractor.
E. Apprentices for a skilled trade must provide proof of participation in a Certified Apprenticeship Program and the level of hours completed in the program.

F. Daily project sign-in sheets and field reports for the project must be turned in weekly.

Note: Contractor invoices WILL NOT be processed until all listed certified payroll documents are received.

G. If the VENDOR or subcontractor fails to pay the prevailing rates of wages and fringe benefits and does not cure such failure within 10 days after notice to do so by the UNIVERSITY, the UNIVERSITY shall have the right, at its option, to do any or all of the following:

1. Withhold all or any portion of payments due the VENDOR as may be considered necessary by the UNIVERSITY to pay laborers and mechanics the difference between the rates of wages and fringe benefits required by this contract and the actual wages and fringe benefits paid;

2. Terminate this contract and proceed to complete the contract by separate agreement with another vendor or otherwise, in which case the VENDOR and its sureties shall be liable to the UNIVERSITY for any excess costs incurred by the UNIVERSITY.

3. Propose to the Director of Purchasing that the Vendor be considered for Debarment in accordance with the University’s Debarment Policy, found on our website at http://purchasing.wayne.edu/docs/appm28.pdf

Terms identical or substantially similar to this section of this RFP shall be included in any contract or subcontract pertaining to this project.

H. The current applicable prevailing wage rates as identified by the State of Michigan Department of Consumer & Industry Services, Bureau of Safety and Regulation, Wage and Hour Division are attached. Refer to item C above if additional information is required.

I. Prior to award of the project, the apparent low bidder will be required to produce a schedule of values which will include the proposed subcontractors for each division of work and whether the subcontractor is signatory or non-signatory. A letter of intent or contract will not be issued to the apparent low bidder until this document is provided. The apparent low bidder will have one week to produce this document. If the required document is not received within this time, the bidder will be disqualified, and the next low bidder will be required to provide this schedule of values.

SEE ATTACHED STATE PREVAILING WAGE INFORMATION
**Wayne County**  
**Official 2014 Prevailing Wage Rates for State Funded Projects**  
**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015  
**Page 1 of 29**

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4 ten hour days @ straight time allowed  
Monday-Saturday, must be consecutive

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4 ten hour days @ straight time allowed  
Monday-Saturday, must be consecutive

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Apprentice Rates:

1st 6 months  
$40.31  
$59.49  
$78.67

2nd 6 months  
$41.45  
$61.21  
$80.95

3rd 6 months  
$42.57  
$62.88  
$83.19

4th 6 months  
$43.69  
$64.57  
$85.43

5th 6 months  
$44.81  
$66.24  
$87.67

6th 6 months  
$49.53  
$73.40  
$97.26

7th 6 months  
$49.32  
$73.01  
$96.69

8th 6 months  
$51.58  
$76.40  
$101.21

Official Request #: 1582  
Requestor: Wayne State University  
Project Description: Groundwater Infiltration Repairs & Landscaping  
Project Number: 511-228377  
County: Wayne

**Official Rate Schedule**  
Every contractor and subcontractor shall keep posted on the construction site, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
### Bricklayer

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<th>Name</th>
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*Make up day allowed comment*

Saturday for 5 day 8 hour week
Friday for 4 day 10 hour week

4 10s allowed M-TH

**Apprentice Rates:**

- 1st 6 months: $31.87, $47.81, $63.74
- 2nd 6 months: $33.72, $50.60, $67.44
- 3rd 6 months: $35.57, $53.37, $71.14
- 4th 6 months: $37.42, $56.14, $74.84
- 5th 6 months: $39.27, $58.92, $78.54
- 6th 6 months: $41.12, $61.70, $82.24
- 7th 6 months: $42.97, $64.46, $85.94
- 8th 6 months: $44.82, $67.24, $99.64

### Carpenter

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<th>Name</th>
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*Four 10s allowed M-Sat; double time due when over 12 hours worked per day*

*Make up day allowed comment*

Saturday

**Apprentice Rates:**

- 1st 6 months: $24.23, $32.71, $41.18
- 2nd 6 months: $28.25, $38.73, $49.22
- 3rd 6 months: $30.35, $41.88, $53.42
- 4th 6 months: $32.44, $45.02, $57.60
- 5th 6 months: $34.54, $48.17, $61.80
- 6th 6 months: $36.63, $51.31, $65.98
- 7th 6 months: $38.74, $54.48, $70.20
- 8th 6 months: $40.82, $57.59, $74.36

---

**Official Request #: 1582**

Requester: Wayne State University

Project Description: Groundwater Infiltration Repairs & Landscaping

Project Number: 511-228377

County: Wayne

---

**Official Rate Schedule**

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
## Carpenter

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*four 10s allowed Mon-Sat; double time due when over 12 hours worked per day*

*Make up day allowed comment*

*Saturdays*

### Apprentice Rates:

- 1st year: $33.82 $46.92 $60.00
- 3rd 6 months: $36.21 $50.49 $64.78
- 4th 6 months: $38.58 $54.05 $69.52
- 5th 6 months: $40.97 $57.64 $74.30
- 6th 6 months: $43.33 $61.17 $79.02
- 7th 6 months: $45.72 $64.77 $83.80
- 8th 6 months: $48.09 $68.32 $88.54

## Piledriver

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*Four 10s allowed Monday-Saturday; double time due when over 12 hours worked per day*

*Make up day allowed comment*

*Saturday*

### Apprentice Rates:

- 1st 6 months: $33.82 $46.92 $60.00
- 2nd 6 months: $38.58 $54.05 $69.52
- 3rd 6 months: $43.33 $61.17 $79.02
- 4th 6 months: $48.09 $68.32 $88.54

## Cement Mason

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### Apprentice Rates:

- 1st 6 months: $29.13 $39.45 $49.77
- 2nd 6 months: $31.20 $42.54 $53.87
- 3rd 6 months: $35.31 $48.67 $62.01
- 4th 6 months: $39.46 $54.85 $70.23
- 5th 6 months: $41.52 $57.91 $74.30
- 6th 6 months: $45.67 $64.10 $82.52

---

**Official Request #:** 1582  
**Requester:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

**Official Rate Schedule**

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
## Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

### Page 4 of 29

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**Apprentice Rates:**

1st 6 months  $26.77  $36.07  $45.36  
2nd 6 months   $28.68  $38.91  $49.13  
3rd 6 months   $32.50  $45.59  $56.66  
4th 6 months   $36.32  $50.26  $64.19  
5th 6 months   $38.24  $53.11  $67.98  
6th 6 months   $42.06  $58.79  $75.51  

**Drywall**

Drywall Taper  PT-22-D  9/5/2014  $44.41  $57.66  $70.91  H H H D D D Y

- Four 10s allowed Monday-Thursday
- Make up day allowed  comment
- Friday make-up day for bad weather or holidays

**Apprentice Rates:**

First 3 months  $31.16  $37.79  $44.41  
Second 3 months $33.81  $41.76  $49.71  
Second 6 months $36.46  $45.73  $55.01  
Third 6 months  $39.11  $49.71  $60.31  
4th 6 months    $40.43  $51.69  $62.95  

**Electrician**

Inside Wireman EC-58-IW  10/2/2014  $58.91  $77.39  $95.87  H H H H H D N

**Apprentice Rates:**

- 0-1000 hours  $36.73  $44.12  $51.51  
- 1000-2000 hours $38.58  $46.89  $55.21  
- 2000-3500 hours $40.43  $49.67  $58.91  
- 3500-5000 hours $42.27  $52.44  $62.59  
- 5000-6500 hours $45.97  $57.98  $69.99  
- 6500-8000 hours $49.67  $63.53  $77.39  

---

Official Request #: 1582  
Requestor: Wayne State University  
Project Description: Groundwater Infiltration Repairs & Landscaping  
Project Number: 511-228377  
County: Wayne
### Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

---

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name Description</th>
<th>Updated</th>
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<th>Straight Time and a Half Hourly</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound and Communication Installer/Technician</td>
<td>EC-58-SC</td>
<td>10/2/2014</td>
<td>$37.48</td>
<td>$50.29</td>
<td>$63.09</td>
<td>H H H H H D N</td>
</tr>
</tbody>
</table>

**Apprentice Rates:**
- Period 1: $24.67 $31.07 $37.47
- Period 2: $25.95 $32.99 $40.03
- Period 3: $27.24 $34.93 $42.61
- Period 4: $28.51 $36.83 $45.15
- Period 5: $29.79 $38.75 $47.71
- Period 6: $31.07 $40.67 $50.27

| Glazier               | GL-357                                      | 10/2/2014 | $47.35       | $65.97                          | $84.58      | H H H H H D Y       |

If a four 10 hour day workweek is scheduled, four 10s must be consecutive, M-F.

**Apprentice Rates:**
- 1st 6 months: $32.45 $43.62 $54.78
- 2nd 6 months: $33.94 $45.85 $57.76
- 3rd 6 months: $36.92 $50.33 $63.72
- 4th 6 months: $38.41 $52.56 $66.70
- 5th 6 months: $39.90 $54.79 $69.68
- 6th 6 months: $41.39 $57.03 $72.66
- 7th 6 months: $42.88 $59.27 $75.64
- 8th 6 months: $45.86 $63.73 $81.60

### Heat and Frost Insulator


---

**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Statewide
### Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
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<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat and Frost Insulator and Asbestos Worker</strong></td>
<td>Heat and Frost Insulators and Asbestos Workers</td>
<td>AS25</td>
<td>1/29/2014</td>
<td>$60.25</td>
<td>$76.00</td>
</tr>
</tbody>
</table>

Four 10s must be worked for a minimum of 2 consecutive weeks, Monday thru Thursday. All hours worked in excess of 10 will be paid at double time. All hours worked on the fifth day, Sat first 8, 1.5, all hours after 8 require double time.

*Apprentice Rates:*

- **1st Year**  
  $46.08 $54.74 $63.40
- **2nd Year**  
  $49.23 $59.46 $69.70
- **3rd Year**  
  $50.80 $61.82 $72.84
- **4th Year**  
  $53.95 $66.54 $79.14

| Ironworker | Fence, Sound Barrier & Guardrail erection/installation and Exterior Signage work | IR-25-F1 | 8/13/2014 | $34.20 | $46.45 | $58.69 X X H X X H D Y |

Four ten hour work days may be worked during Monday-Saturday.

*Apprentice Rates:*

- **60% Level**  
  $23.04 $30.39 $37.73
- **65% Level**  
  $24.37 $32.33 $40.29
- **70% Level**  
  $25.70 $34.27 $42.84
- **75% Level**  
  $27.02 $36.21 $45.39
- **80% Level**  
  $28.34 $38.13 $47.93
- **85% Level**  
  $29.67 $40.08 $50.49

---

**Official Rate Schedule**

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

---
## Official 2014 Prevailing Wage Rates for State Funded Projects

### Issue Date: 11/19/2014

### Contract must be awarded by: 2/17/2015

### Page 7 of 29

<table>
<thead>
<tr>
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<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siding, Glazing, Curtain Wall</td>
<td>IR-25-GZ2</td>
<td>9/4/2014</td>
<td>$46.41</td>
<td>$58.07</td>
<td>$69.73</td>
<td>X X H H H D Y</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 tens may be worked Monday thru Thursday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>@ straight time.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Make up day allowed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Friday</td>
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<td></td>
</tr>
</tbody>
</table>

### Apprentice Rates:

- **Level 1**: $29.48 $36.09 $42.68
- **Level 2**: $31.59 $38.83 $46.05
- **Level 3**: $33.71 $41.58 $49.44
- **Level 4**: $35.83 $44.33 $52.82
- **Level 5**: $37.94 $47.07 $56.20
- **Level 6**: $40.06 $49.82 $59.58

### Pre-engineered Metal Work

- **IR-25-PE-Z1**: 6/3/2014 | $45.24 | $55.53 | $65.81 | X X H X X X D Y |

| | | | Make up day allowed | comment |
| | | | 4 tens allowed M-Th with Saturday make up day |

### Apprentice Rates:

- **1st Year**: $26.11 $31.58 $37.06
- **3rd 6 month period**: $28.23 $34.46 $40.68
- **4th 6 month period**: $30.36 $37.35 $44.33
- **5th 6 month period**: $32.48 $40.21 $47.95
- **6th 6 month period**: $34.61 $43.99 $53.37

| | | | Make up day allowed | |
| | | | Apprentice Rates: | |

### Reinforced Iron Work

- **IR-25-RF**: 9/3/2014 | $55.36 | $82.91 | $110.45 | H H D D D D N |

| | | | Make up day allowed | |
| | | | Apprentice Rates: | |

### Rigging Work

- **IR-25-RIG**: 9/3/2014 | $61.33 | $91.67 | $122.00 | H H H H H H D N |

### Apprentice Rates:

- **Level 1 & 2**: $36.01 $53.89 $71.75
- **Level 3**: $38.38 $57.43 $76.49
- **Level 4**: $40.74 $60.98 $81.21
- **Level 5**: $43.28 $64.78 $86.29
- **Level 6**: $45.81 $68.59 $91.35

### Official Request #: 1582

- Requestor: Wayne State University
- Project Description: Groundwater Infiltration Repairs & Landscaping
- Project Number: 511-228377
- County: Wayne

### Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
### Decking
4 tens may be worked Monday thru Thursday @ straight time. If bad weather, Friday may be a make up day. If holiday celebrated on a Monday, 4 10s may be worked Tuesday thru Friday. Work in excess of 12 hours per day must be paid @ double time.

*Make up day allowed*  
**comment**
- Friday for 4 tens M-Th  
- Saturday for 5 eights M-F

<table>
<thead>
<tr>
<th>Last Updated</th>
<th>Straight Time and a Half Provision</th>
<th>Hourly Provision</th>
<th>Double Time Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/4/2014</td>
<td>X X H H H H D Y</td>
<td>$53.29</td>
<td>$79.63 $105.96</td>
</tr>
</tbody>
</table>

### Structural, ornamental, welder and pre-cast
4 tens may be worked Monday thru Thursday @ straight time. If bad weather, Friday may be a make up day. If holiday celebrated on a Monday, 4 10s may be worked Tuesday thru Friday. Work in excess of 12 hours per day must be paid @ double time.

*Make up day allowed*  
**comment**

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</thead>
<tbody>
<tr>
<td>9/3/2014</td>
<td>H H H H H H D Y</td>
<td>$61.46</td>
<td>$91.84 $122.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apprentice Rates:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels 1 &amp; 2</td>
</tr>
<tr>
<td>Level 3</td>
</tr>
<tr>
<td>Level 4</td>
</tr>
<tr>
<td>Level 5</td>
</tr>
<tr>
<td>Level 6</td>
</tr>
<tr>
<td>Level 7</td>
</tr>
<tr>
<td>Level 8</td>
</tr>
</tbody>
</table>

### Industrial Door erection & construction
Friday for bad weather when 4 tens scheduled for M-Th. If holiday celebrated on M, 4 tens may be worked T-F. Work in excess of 12 hours per day must be paid @ double time.

*Make up day allowed*  
**comment**

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<tr>
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<th>Double Time Provision</th>
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</thead>
<tbody>
<tr>
<td>9/4/2014</td>
<td>H H H H H H D Y</td>
<td>$42.02</td>
<td>$62.68 $83.33</td>
</tr>
</tbody>
</table>
Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 11/19/2014
Contract must be awarded by: 2/17/2015

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<tr>
<th>Classification</th>
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<th>Straight Time and a Half Time</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laborer</td>
<td>Construction Laborer, Demolition Laborer, Mason</td>
<td>L33401-A-CC 7/15/2013 Laborer, Carpenter, Drywall Handler, Concrete Laborer, Cement Finisher Tender, Concrete Chute, and Concrete Bucket Handler</td>
<td>$43.54</td>
<td>$61.94</td>
<td>$80.33</td>
<td>H H H H H Y</td>
</tr>
<tr>
<td></td>
<td>Tender, Carpenter Tender, Drywall Handler, Concrete Laborer, Cement Finisher Tender, Concrete Chute, and Concrete Bucket Handler</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If conditions beyond the employer/employee’s control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8

Make up day allowed comment

Saturday

Apprentice Rates:

<table>
<thead>
<tr>
<th>Work Hours</th>
<th>Straight Time</th>
<th>Half Time</th>
<th>Double Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1,000 work hours</td>
<td>$37.60</td>
<td>$53.03</td>
<td>$68.45</td>
</tr>
<tr>
<td>1,001 - 2,000 work hours</td>
<td>$38.79</td>
<td>$54.81</td>
<td>$70.83</td>
</tr>
<tr>
<td>2,001 - 3,000 work hours</td>
<td>$39.98</td>
<td>$56.60</td>
<td>$73.21</td>
</tr>
<tr>
<td>3,001 - 4,000 work hours</td>
<td>$42.35</td>
<td>$60.15</td>
<td>$77.95</td>
</tr>
</tbody>
</table>

Signal Man (on sewer & caisson work), Air, Electric or Gasoline Tool Operator, Concrete Vibrator Operator, Acetylene Torch & Air Hammer Operator; Scaffold Builder, Caisson Worker

If conditions beyond the employer/employee’s control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8

Make up day allowed comment

Saturday
Official 2014 Prevailing Wage Rates for State Funded Projects

<table>
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<tr>
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<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnace Battery Heater Tender, Burning Bar &amp; Oxy-Acetylene Gun</td>
<td>L33401-D-HH</td>
<td>7/16/2013</td>
<td>$44.04</td>
<td>$62.69</td>
<td>H H H H H H D Y</td>
</tr>
<tr>
<td>If conditions beyond the employer/employee's control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8 hours of work on Saturdays @ straight time. Make up day allowed comment Saturday</td>
<td></td>
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</tr>
<tr>
<td>Expediter Man, Top Man and/or Bottom Man (Blast Furnace Work or Battery Work)</td>
<td>L33401-E-EX</td>
<td>7/16/2013</td>
<td>$44.79</td>
<td>$63.81</td>
<td>H H H H H H D Y</td>
</tr>
<tr>
<td>If conditions beyond the employer/employee's control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8 hours of work on Saturdays @ straight time. Make up day allowed comment Saturday</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cleaner/Sweeper Laborer; Furniture Laborer</td>
<td>L33401-F-CL</td>
<td>7/16/2013</td>
<td>$38.09</td>
<td>$53.76</td>
<td>H H H H H H D Y</td>
</tr>
<tr>
<td>If conditions beyond the employer/employee's control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8 hours of work on Saturdays @ straight time. Make up day allowed comment Saturday</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lansing Burner, Blaster &amp; Powder Man; Air, Electric or Gasoline Tool Operator (Blast Furnace Work or Battery Work)</td>
<td>L334C</td>
<td>7/16/2013</td>
<td>$44.29</td>
<td>$63.06</td>
<td>X X H X H H H D Y</td>
</tr>
<tr>
<td>Make up day allowed comment Saturday</td>
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<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasterer Tender, Plastering Machine Operator</td>
<td>LPT-1</td>
<td></td>
<td>10/25/2013</td>
<td>$43.54</td>
<td>$61.94</td>
<td>$80.33 X X H H H H D Y</td>
</tr>
</tbody>
</table>

If conditions beyond the employer/employee's control prevent one or more hours of working during Mon-Fri, the employer may choose to work up to 10 hour straight time weekdays. Work may be scheduled up to 10 hours per Mon-Fri for the purpose of reaching 40 hours @ straight time. Make up days may also include 8 hours.

Make up day allowed  comment
Saturday

**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Hours Range</th>
<th>Straight</th>
<th>Half</th>
<th>Double</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1,000 hours</td>
<td>$37.60</td>
<td>$53.03</td>
<td>$68.45</td>
<td>H H H H H H H Y</td>
</tr>
<tr>
<td>1,001 - 2,000 hours</td>
<td>$38.79</td>
<td>$54.81</td>
<td>$70.83</td>
<td>H H H H H H H Y</td>
</tr>
<tr>
<td>2,001 - 3,000 hours</td>
<td>$39.98</td>
<td>$56.60</td>
<td>$73.21</td>
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</tr>
<tr>
<td>3,001 - 4,000 hours</td>
<td>$42.35</td>
<td>$60.15</td>
<td>$77.95</td>
<td>H H H H H H H Y</td>
</tr>
</tbody>
</table>

**Laborer - Hazardous**

Class A performing work in conjunction with site preparation and other preliminary work prior to actual removal, handling, or containment of hazardous waste substances not requiring use of personal protective equipment required by state or federal regulations; or a laborer performing work in conjunction with the removal, handling, or containment of hazardous waste substances when use of personal protective equipment level "D" is required.

Make up day allowed  comment
Saturday

4 10s allowed M-Th or T-F; inclement weather makeup day Friday

**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Hours Range</th>
<th>Straight</th>
<th>Half</th>
<th>Double</th>
<th>Overtime Provision</th>
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</thead>
<tbody>
<tr>
<td>0-1,000 work hours</td>
<td>$37.60</td>
<td>$53.03</td>
<td>$68.45</td>
<td>H H H H H H H Y</td>
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<tr>
<td>1,001-2,000 work hours</td>
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<td>$54.81</td>
<td>$70.83</td>
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</tr>
<tr>
<td>2,001-3,000 work hours</td>
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<td>$56.60</td>
<td>$73.21</td>
<td>H H H H H H H Y</td>
</tr>
<tr>
<td>3,001-4,000 work hours</td>
<td>$42.35</td>
<td>$60.15</td>
<td>$77.95</td>
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</tr>
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</table>
## Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

### Page 12 of 29

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<tr>
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<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class B performing work in conjunction with the removal, handling, or containment of hazardous waste substances when the use of personal protective equipment levels &quot;A&quot;, &quot;B&quot; or &quot;C&quot; is required.</td>
<td>LHAZ-Z1-B</td>
<td>11/7/2014</td>
<td>$44.54</td>
<td>$63.44</td>
<td>$82.33</td>
<td>H H H H H D Y</td>
</tr>
</tbody>
</table>

**Make up day allowed comment**  
4 10s allowed M-Th or T-F; inclement weather makeup day Friday

### Apprentice Rates:

<table>
<thead>
<tr>
<th></th>
<th>0-1,000 work hours</th>
<th>1,001-2,000 work hours</th>
<th>2,001-3,000 work hours</th>
<th>3,001-4,000 work hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I - Tunnel, shaft and caisson laborer, dump man, shanty man, hog house tender, testing man (on gas), and watchman.</td>
<td>$38.36</td>
<td>$39.59</td>
<td>$40.83</td>
<td>$43.30</td>
</tr>
<tr>
<td><strong>Laborer Underground - Tunnel, Shaft &amp; Caisson</strong></td>
<td><strong>$37.87</strong></td>
<td><strong>$48.66</strong></td>
<td><strong>$59.44</strong></td>
<td><strong>$69.97</strong></td>
</tr>
<tr>
<td>Apprentice Rates:</td>
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<tr>
<td>0-1,000 work hours</td>
<td>$33.05</td>
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<td>$36.91</td>
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<td>1,001-2,000 work hours</td>
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<td>$39.87</td>
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<tr>
<td>2,001-3,000 work hours</td>
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<td>$40.05</td>
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</tr>
<tr>
<td>3,001-4,000 work hours</td>
<td>$37.01</td>
<td>$40.05</td>
<td>$43.08</td>
<td>$46.12</td>
</tr>
</tbody>
</table>

| Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder. | LAUCT-Z1-2 | 9/6/2013 | $37.98 | $48.82 | $59.66 | X X X X X X D Y |

### Apprentice Rates:

<table>
<thead>
<tr>
<th></th>
<th>0-1,000 work hours</th>
<th>1,001-2,000 work hours</th>
<th>2,001-3,000 work hours</th>
<th>3,001-4,000 work hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder.</td>
<td>$33.14</td>
<td>$34.10</td>
<td>$35.07</td>
<td>$37.01</td>
</tr>
<tr>
<td><strong>$37.98</strong></td>
<td><strong>$48.82</strong></td>
<td><strong>$59.66</strong></td>
<td><strong>$69.97</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

**Official Rate Schedule**  
Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
# Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

## Classification Last Updated Straight Time and a Half Time Double Time Overtime Provision

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Updated</th>
<th>Hourly</th>
<th>Half Time</th>
<th>Time</th>
<th>Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class III - Air tool operator (jack hammer man, bush hammer man and grinding man), first bottom man, second bottom man, cage tender, car pusher, carrier man, concrete man, concrete form man, concrete repair man, cement invert laborer, cement finisher, concrete shoveler, conveyor man, floor man, gasoline and electric tool operator, gunnite man, grout operator, welder, heading dinky man, inside lock tender, pea gravel operator, pump man, outside lock tender, scaffold man, top signal man, switch man, track man, tugger man, utility man, vibrator man, winch operator, pipe jacking man, wagon drill and air track operator and concrete saw operator (under 40 h.p.).</td>
<td>LAUCT-Z1-3</td>
<td>9/6/2013</td>
<td>$38.04</td>
<td>$48.91</td>
<td>$59.78</td>
<td>X X X X X X D Y</td>
<td></td>
</tr>
</tbody>
</table>

**Apprentice Rates:**

- 0-1,000 work hours: $33.18, $41.62, $50.06
- 1,001-2,000 work hours: $34.15, $43.07, $52.00
- 2,001-3,000 work hours: $35.12, $44.53, $53.94
- 3,001-4,000 work hours: $37.07, $47.46, $57.84

| Class IV - Tunnel, shaft and caisson mucker, bracer man, liner plate man, long haul dinky driver and well point man. | LAUCT-Z1-4 | 9/6/2013 | $38.22 | $49.18 | $60.14 | X X X X X X D Y |

**Apprentice Rates:**

- 0-1,000 work hours: $33.32, $41.83, $50.34
- 1,001-2,000 work hours: $34.30, $43.30, $52.30
- 2,001-3,000 work hours: $35.28, $44.77, $54.26
- 3,001-4,000 work hours: $37.24, $47.71, $58.18

| Class V - Tunnel, shaft and caisson miner, drill runner, keyboard operator, power knife operator, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars) | LAUCT-Z1-5 | 9/6/2013 | $38.47 | $49.56 | $60.64 | X X X X X X D Y |

**Apprentice Rates:**

- 0-1,000 work hours: $33.50, $42.10, $50.70
- 1,001-2,000 work hours: $34.50, $43.60, $52.70
- 2,001-3,000 work hours: $35.49, $45.09, $54.68
- 3,001-4,000 work hours: $37.48, $48.07, $58.66

---

**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

---

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Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 11/19/2014
Contract must be awarded by: 2/17/2015

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name Description</th>
<th>Last Updated</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class VI - Dynamite man and powder man.</td>
<td>LAUCT-Z1-6 9/6/2013</td>
<td>$38.80</td>
<td>$50.05</td>
<td>$61.30 X X X X X D Y</td>
<td></td>
</tr>
</tbody>
</table>

Apprentice Rates:

- 0-1,000 work hours: $33.75 $42.47 $51.20
- 1,001-2,000 work hours: $34.76 $43.99 $53.22
- 2,001-3,000 work hours: $35.77 $45.51 $55.24
- 3,001-4,000 work hours: $37.79 $48.53 $59.28

Class VII - Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes and flagstones.

Apprentice Rates:

- 0-1,000 work hours: $28.71 $34.91 $41.12
- 1,001-2,000 work hours: $29.38 $35.92 $42.46
- 2,001-3,000 work hours: $30.06 $36.94 $43.82
- 3,001-4,000 work hours: $31.41 $38.97 $46.52

Landscape Laborer

Landscape Specialist includes air, gas, and diesel equipment operator, skidsteer (or equivalent), lawn sprinkler installer on landscaping work where seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintenance of landscape projects occurs.

Sundays paid at time & one half. Holidays paid at double time.

Skilled Landscape Laborer: small power tool operator, lawn sprinkler installers' tender, material mover, truck driver when seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintaining of landscape projects occurs

Sundays paid at time & one half. Holidays paid at double time.

Page 14 of 29
## Official Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

### Page 15 of 29

#### Official Request #: 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
<th>Name</th>
<th>Last Updated</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marble Finisher</td>
<td>Marble Finisher</td>
<td>BR1-MF</td>
<td>10/20/2014</td>
<td>$43.48</td>
<td>$54.29</td>
<td>$65.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.</td>
<td></td>
<td></td>
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**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Level</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$19.04 $25.12 $31.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$20.24 $26.92 $33.60</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>$27.01 $33.96 $40.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$28.47 $36.14 $43.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$29.99 $37.84 $45.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$31.61 $39.86 $48.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$33.30 $41.59 $49.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$34.79 $43.48 $52.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Marble Mason | Marble Mason | BR1-MM | 10/17/2014 | $50.29 | $64.51 | $78.72 | H | H | D | D | D | D | D | D | Y |
| | | | | A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday. |

**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Level</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$25.14 $32.65 $40.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$28.20 $36.49 $44.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$33.41 $41.97 $50.53</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>$36.15 $45.66 $55.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$38.42 $48.17 $57.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$42.07 $53.56 $65.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$42.74 $54.38 $66.02</td>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>$43.67 $55.78 $67.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Operating Engineer | Crane with boom & jib or leads 120' or longer | EN-324-A120 | 6/12/2014 | $57.11 | $74.62 | $92.13 | X | X | H | H | D | D | D | D | Y |
| | | | | Double time after 12 hours M-F |

| | Crane with boom & jib or leads 140' or longer | EN-324-A140 | 6/12/2014 | $57.93 | $75.85 | $93.77 | X | X | H | H | D | D | D | D | Y |
| | | | | Work in excess of 12 per day M-F shall be paid at double time. |

**Official Rate Schedule**

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## Official 2014 Prevailing Wage Rates for State Funded Projects

### Issue Date: 11/19/2014

### Contract must be awarded by: 2/17/2015

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Last Updated</th>
<th>Straight Time and a Half Hourly</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crane with boom &amp; jib or leads 220' or longer</td>
<td>EN-324-A220</td>
<td>6/12/2014</td>
<td>$58.23</td>
<td>$76.30</td>
<td>$94.37 X X H D D D Y</td>
<td></td>
</tr>
<tr>
<td>Work in excess of 12 per day M-F shall be paid at double time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Crane with boom & jib or leads 300' or longer            | EN-324-A300 | 6/12/2014 | $59.73       | $78.55                         | $97.37 X X H D D D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |

| Crane with boom & jib or leads 400' or longer            | EN-324-A400 | 6/12/2014 | $61.23       | $80.80                         | $100.37 X X H H D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |

| Compressor or welding machine                           | EN-324-CW   | 6/12/2014 | $46.26       | $58.35                         | $70.43 X X H D D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |

| Forklift, lull, extend-a-boom forklift                   | EN-324-FL   | 6/12/2014 | $53.57       | $69.31                         | $85.05 X X H H D D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |

| Fireman or oiler                                         | EN-324-FO   | 6/12/2014 | $45.23       | $56.80                         | $68.37 X X H H D D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |

| Regular crane, job mechanic, concrete pump with boom     | EN-324-RC   | 6/12/2014 | $56.25       | $73.33                         | $90.41 X X H H D D D Y |
| Work in excess of 12 per day M-F shall be paid at double time. |
prescribed in a contract.
Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 11/19/2014
Contract must be awarded by: 2/17/2015

Page 17 of 29

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name Description</th>
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<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hourly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular engineer, hydro-excavator, remote</td>
<td>EN-324-RE</td>
<td>6/12/2014</td>
<td>$55.28</td>
<td>$71.88</td>
<td>X X H H D D D Y</td>
</tr>
<tr>
<td>controlled concrete breaker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work in excess of 12 per day M-F shall be paid at</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>double time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Apprentice Rates:

<table>
<thead>
<tr>
<th>Hours Range</th>
<th>Rate per Hour</th>
<th>Rate per Half Hour</th>
<th>Rate per Hourly</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-999 hours</td>
<td>$44.32</td>
<td>$55.94</td>
<td>$67.55</td>
</tr>
<tr>
<td>1,000-1,999 hours</td>
<td>$45.99</td>
<td>$58.45</td>
<td>$70.89</td>
</tr>
<tr>
<td>2,000-2,999 hours</td>
<td>$47.64</td>
<td>$60.92</td>
<td>$74.19</td>
</tr>
<tr>
<td>3,000-3,999 hours</td>
<td>$49.30</td>
<td>$63.41</td>
<td>$77.51</td>
</tr>
<tr>
<td>4,000-4,999 hours</td>
<td>$50.96</td>
<td>$65.90</td>
<td>$80.83</td>
</tr>
<tr>
<td>5,000-5,999 hours</td>
<td>$52.62</td>
<td>$68.39</td>
<td>$84.15</td>
</tr>
</tbody>
</table>

Operating Engineer - DIVER

Diver/Wet Tender/Tender/Rov Pilot/Rov Tender GLF D 4/2/2014 $52.80 $79.20 $105.60 H H H H H H D N

Operating Engineer - Marine Construction

Diver/Wet Tender, Engineer (hydraulic dredge) GLF-1 2/12/2014 $65.00 $84.85 $104.70 X X H H H H D Y

Make up day allowed

Subdivision of county all Great Lakes, islands therein, & connecting & tributary waters

Crane/Backhoe Operator, 70 ton or over Tug Operator, Mechanic/Welder, Assistant Engineer (hydraulic dredge), Leverman (hydraulic dredge), Diver Tender

Holiday pay = $120.80 per hour, wages &

Make up day allowed

Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters

Friction, Lattice Boom or Crane License GLF-2B 2/12/2014 $64.50 $84.10 $103.70 X X H H H H D Y

Certification

Holiday pay = $123.30

Make up day allowed

Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters

Official Request #: 1582
Requestor: Wayne State University
Project Description: Groundwater Infiltration Repairs & Landscaping
Project Number: 511-228377
County: Statewide

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</tr>
</thead>
<tbody>
<tr>
<td>GLF-3</td>
<td>Deck Equipment Operator, Machineryman, Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 lbs or more), Tug/Launch Operator, Loader, Dozer on Barge, Deck Machinery</td>
<td>2/12/2014</td>
<td>$59.30</td>
<td>$76.30</td>
<td>$93.30</td>
<td>X X H H H H D Y</td>
</tr>
<tr>
<td>GLF-3</td>
<td>Holiday pay = $110.30 per hour, wages &amp; Make up day allowed</td>
<td>2/12/2014</td>
<td>$59.30</td>
<td>$76.30</td>
<td>$93.30</td>
<td>X X H H H H D Y</td>
</tr>
<tr>
<td>GLF-4</td>
<td>Deck Equipment Operator, (Machinryman/Fireman), (4 equipment units or more), Off Road Trucks, Deck Hand, Tug Engineer, &amp; Crane Maintenance 50 ton capacity and under or Backhoe 115,000 lbs or less, Assistant Tug Operator</td>
<td>2/12/2014</td>
<td>$53.60</td>
<td>$67.75</td>
<td>$81.90</td>
<td>X X H H H H D Y</td>
</tr>
<tr>
<td>GLF-4</td>
<td>Holiday pay = $96.05 per hour, wages &amp; fringes Make up day allowed</td>
<td>2/12/2014</td>
<td>$53.60</td>
<td>$67.75</td>
<td>$81.90</td>
<td>X X H H H H D Y</td>
</tr>
</tbody>
</table>

Subdivision of county: All Great Lakes, islands therein, & connecting & tributary waters

Operating Engineer Steel Work

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
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<th>Double Time</th>
<th>Overtime Provision</th>
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</thead>
<tbody>
<tr>
<td>EN-324-ef</td>
<td>Forklift, 1 Drum Hoist</td>
<td>9/5/2014</td>
<td>$58.16</td>
<td>$76.37</td>
<td>$94.58</td>
<td>H H D H H H D D Y</td>
</tr>
<tr>
<td>EN-324-ef</td>
<td>Make up day allowed</td>
<td>9/5/2014</td>
<td>$58.16</td>
<td>$76.37</td>
<td>$94.58</td>
<td>H H D H H H D D Y</td>
</tr>
<tr>
<td>EN-324-ef</td>
<td>4 10s allowed M-Th with Friday makeup day because of bad weather</td>
<td>9/5/2014</td>
<td>$58.16</td>
<td>$76.37</td>
<td>$94.58</td>
<td>H H D H H H D D Y</td>
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Crane w/ 120' boom or longer

<table>
<thead>
<tr>
<th>Classification</th>
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<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN-324-SW120</td>
<td>Crane w/ 120' boom or longer</td>
<td>9/5/2014</td>
<td>$60.86</td>
<td>$80.42</td>
<td>$99.98</td>
<td>H H D H H H D D Y</td>
</tr>
<tr>
<td>EN-324-SW120</td>
<td>Make up day allowed</td>
<td>9/5/2014</td>
<td>$60.86</td>
<td>$80.42</td>
<td>$99.98</td>
<td>H H D H H H D D Y</td>
</tr>
<tr>
<td>EN-324-SW120</td>
<td>4 10s allowed M-Th with Friday makeup day because of bad weather</td>
<td>9/5/2014</td>
<td>$60.86</td>
<td>$80.42</td>
<td>$99.98</td>
<td>H H D H H H D D Y</td>
</tr>
</tbody>
</table>

Crane w/ 140' boom or longer

<table>
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<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Last Updated</th>
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<th>Double Time</th>
<th>Overtime Provision</th>
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</thead>
<tbody>
<tr>
<td>EN-324-SW140</td>
<td>Crane w/ 140' boom or longer</td>
<td>9/5/2014</td>
<td>$62.04</td>
<td>$82.19</td>
<td>$102.34</td>
<td>H H D H H H D D Y</td>
</tr>
<tr>
<td>EN-324-SW140</td>
<td>Make up day allowed</td>
<td>9/5/2014</td>
<td>$62.04</td>
<td>$82.19</td>
<td>$102.34</td>
<td>H H D H H H D D Y</td>
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<tr>
<td>EN-324-SW140</td>
<td>4 10s allowed M-Th with Friday makeup day because of bad weather</td>
<td>9/5/2014</td>
<td>$62.04</td>
<td>$82.19</td>
<td>$102.34</td>
<td>H H D H H H D D Y</td>
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</tbody>
</table>

Crane w/ 140' boom or longer W/ Oiler

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Last Updated</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN-324-SW140-O</td>
<td>Crane w/ 140' boom or longer W/ Oiler</td>
<td>9/5/2014</td>
<td>$63.04</td>
<td>$83.69</td>
<td>$104.34</td>
<td>H H D H H H D D</td>
</tr>
<tr>
<td>EN-324-SW140-O</td>
<td>Make up day allowed</td>
<td>9/5/2014</td>
<td>$63.04</td>
<td>$83.69</td>
<td>$104.34</td>
<td>H H D H H H D D</td>
</tr>
<tr>
<td>EN-324-SW140-O</td>
<td>4 10s allowed M-Th with Friday makeup day because of bad weather</td>
<td>9/5/2014</td>
<td>$63.04</td>
<td>$83.69</td>
<td>$104.34</td>
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</table>
## Official 2014 Prevailing Wage Rates for State Funded Projects

### Issue Date: 11/19/2014

**Contract must be awarded by:** 2/17/2015

**Page 19 of 29**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Last Updated</th>
<th>Straight Time and Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
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<tbody>
<tr>
<td>Boom &amp; Jib 220’ or longer</td>
<td>EN-324-SW220 9/5/2014</td>
<td>$62.31</td>
<td>$82.60</td>
<td>$102.88</td>
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</tr>
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<td>EN-324-SW220-O 9/5/2014</td>
<td>$63.31</td>
<td>$84.10</td>
<td>$104.88</td>
<td>H D H H D D D Y</td>
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<td>Boom &amp; Jib 300’ or longer</td>
<td>EN-324-SW300 9/5/2014</td>
<td>$63.81</td>
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<td>$105.88</td>
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<td>Crane w/ 300’ boom or longer w/ Oiler</td>
<td>EN-324-SW300-O 9/5/2014</td>
<td>$64.81</td>
<td>$86.35</td>
<td>$107.88</td>
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<tr>
<td>Boom &amp; Jib 400’ or longer</td>
<td>EN-324-SW400 9/5/2014</td>
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<td>$108.88</td>
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<td>$66.31</td>
<td>$88.60</td>
<td>$110.88</td>
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<tr>
<td>Crane Operator, Job Mechanic, 3 Drum Hoist &amp; Excavator</td>
<td>EN-324-SWCO 9/5/2014</td>
<td>$60.50</td>
<td>$79.88</td>
<td>$99.26</td>
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**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Straight Time</th>
<th>Half Time</th>
<th>Double Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-999 hours</td>
<td>$47.87</td>
<td>$61.43</td>
<td>$75.00</td>
</tr>
<tr>
<td>1,000-1,999 hours</td>
<td>$49.81</td>
<td>$64.35</td>
<td>$78.88</td>
</tr>
<tr>
<td>2,000-2,999 hours</td>
<td>$51.74</td>
<td>$67.24</td>
<td>$82.74</td>
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<tr>
<td>3,000-3,999 hours</td>
<td>$53.68</td>
<td>$70.15</td>
<td>$86.62</td>
</tr>
<tr>
<td>4,000-4,999 hours</td>
<td>$55.62</td>
<td>$73.07</td>
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</tr>
<tr>
<td>5,000 hours</td>
<td>$57.56</td>
<td>$75.97</td>
<td>$94.38</td>
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</table>

| Crane Operator w/ Oiler | EN-324-SWCO-O 9/5/2014 | $61.50 | $81.38 | $101.26 | H D H H D D Y |

<table>
<thead>
<tr>
<th>Official Request #: 1582</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requestor: Wayne State University</td>
</tr>
<tr>
<td>Project Description: Groundwater Infiltration Repairs &amp; Landscaping</td>
</tr>
<tr>
<td>Project Number: 511-228377</td>
</tr>
<tr>
<td>County: Wayne</td>
</tr>
</tbody>
</table>

**Official Rate Schedule**

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
# Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compressor or Welder Operator</td>
</tr>
<tr>
<td></td>
<td>Hoisting Operator, 2 Drum Hoist, &amp; Rubber Tire Backhoe</td>
</tr>
<tr>
<td></td>
<td>Oiler</td>
</tr>
<tr>
<td></td>
<td>Tower Crane &amp; Derrick where work is 50' or more above first level</td>
</tr>
<tr>
<td></td>
<td>Tower Crane &amp; Derrick 50' or more w/ Oiler where work station is 50' or more above first</td>
</tr>
<tr>
<td></td>
<td>Operating Engineer Underground</td>
</tr>
<tr>
<td></td>
<td>Operating Engineer Underground</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name Description</th>
<th>Last Updated</th>
<th>Straight Time and a Half Hourly</th>
<th>Double Time</th>
<th>Overtime Provision</th>
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</thead>
<tbody>
<tr>
<td>EN-324-SWCW</td>
<td>9/5/2014</td>
<td>$53.15</td>
<td>$68.86</td>
<td>$84.56</td>
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<tr>
<td>EN-324-SWHO</td>
<td>9/5/2014</td>
<td>$59.86</td>
<td>$78.92</td>
<td>$97.98</td>
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<tr>
<td>EN-324-SWO</td>
<td>9/5/2014</td>
<td>$51.64</td>
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<td>$81.54</td>
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<tr>
<td>EN-324-SWTD50</td>
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<td>$61.59</td>
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<tr>
<td>EN-324-SWTD50-O</td>
<td>9/5/2014</td>
<td>$62.59</td>
<td>$83.02</td>
<td>$103.44</td>
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<tr>
<td>EN-324A1-UC1</td>
<td>10/14/2014</td>
<td>$51.74</td>
<td>$66.98</td>
<td>$82.22</td>
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<tr>
<td>EN-324A1-UC2</td>
<td>10/14/2014</td>
<td>$47.01</td>
<td>$59.89</td>
<td>$72.76</td>
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</table>

**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Hourly</th>
<th>Half Time</th>
<th>Double Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-999 hours</td>
<td>$41.79</td>
<td>$52.45</td>
<td>$63.12</td>
</tr>
<tr>
<td>1,000-1,999 hours</td>
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<td>$44.84</td>
<td>$57.03</td>
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<td>3,000-3,999 hours</td>
<td>$46.36</td>
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<td>$72.26</td>
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<td>4,000-4,999 hours</td>
<td>$47.89</td>
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<tr>
<td>5,000-5,999 hours</td>
<td>$49.41</td>
<td>$63.89</td>
<td>$78.36</td>
</tr>
</tbody>
</table>

Official Request #: 1582  
Requestor: Wayne State University  
Project Description: Groundwater Infiltration Repairs & Landscaping  
Project Number: 511-228377  
County: Wayne

Official Rate Schedule  
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### Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
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#### Prevailing Wage Rate Schedule

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Last Updated</th>
<th>Straight Time and a Half</th>
<th>Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class III Equipment</td>
<td>EN-324A1-UC3</td>
<td>10/14/2014</td>
<td>$46.28</td>
<td>$58.79</td>
<td>$71.30</td>
</tr>
<tr>
<td>Class IV Equipment</td>
<td>EN-324A1-UC4</td>
<td>10/14/2014</td>
<td>$45.71</td>
<td>$57.94</td>
<td>$70.16</td>
</tr>
<tr>
<td>Master Mechanic</td>
<td>EN-324A1-UMM</td>
<td>10/14/2014</td>
<td>$51.99</td>
<td></td>
<td>$67.81</td>
</tr>
</tbody>
</table>

**Painter**

Painter (8 hours of repaint work performed on Sunday shall be paid time & one half rate)

Painter (8 hours of repaint work performed on Sunday shall be paid time & one half rate)

Four 10s allowed Monday-Thursday with Friday makeup day if job down due to weather, holiday or other conditions beyond the control of the employer.  

*Make up day allowed comment*

Fridays for bad weather or holidays

**Apprentice Rates:**

| First 6 months | $30.02 | $36.43 | $42.83 |
| Second 6 months| $33.86 | $42.19 | $50.51 |
| Third 6 months | $35.14 | $44.11 | $53.07 |
| Fourth 6 months| $36.42 | $46.03 | $55.63 |
| Fifth 6 months | $37.70 | $47.95 | $58.19 |
| Final 6 months | $38.98 | $49.87 | $60.75 |

**Pipe and Manhole Rehab**

General Laborer for rehab work or normal cleaning and cctv work-top man, scaffold man, CCTV assistant, jetter-vac assistant

Pipe and Manhole Rehab

<table>
<thead>
<tr>
<th>Tap cutter/CCTV Tech/Grout Equipment Operator: unit driver and operator of CCTV; grouting equipment and tap cutting equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM247-2</td>
</tr>
<tr>
<td>10/15/2012</td>
</tr>
<tr>
<td>$31.70</td>
</tr>
<tr>
<td>$43.45</td>
</tr>
<tr>
<td>$H H H H H H H H N</td>
</tr>
</tbody>
</table>

Official Request #: 1582

Requestor: Wayne State University

Project Description: Groundwater Infiltration Repairs & Landscaping

Project Number: 511-228377

County: Statewide

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

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**Official 2014 Prevailing Wage Rates for State Funded Projects**

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015  

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### Classification Last Straight Time and a Double Overtime Hourly Half Time Provision

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Last Updated</th>
<th>Straight Time</th>
<th>a Double Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCTV Technician/Combo Unit Operator: unit driver and operator of cctv unit or combo unit in connection with normal cleaning and televising work</td>
<td>TM247-3</td>
<td>10/15/2012</td>
<td>$30.45</td>
<td>$41.57</td>
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</tr>
<tr>
<td>Boiler Operator: unit driver and operator of steam/water heater units and all ancillary equipment associated</td>
<td>TM247-4</td>
<td>10/15/2012</td>
<td>$32.20</td>
<td>$44.20</td>
<td>H H H H H H H H N</td>
</tr>
<tr>
<td>Combo Unit driver &amp; Jetter-Vac Operator</td>
<td>TM247-5</td>
<td>10/15/2012</td>
<td>$32.20</td>
<td>$44.20</td>
<td>H H H H H H H H N</td>
</tr>
<tr>
<td>Pipe Bursting &amp; Slip-lining Equipment Operator</td>
<td>TM247-6</td>
<td>10/15/2012</td>
<td>$33.20</td>
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<tr>
<td>Pipefitter</td>
<td>PF-636</td>
<td>6/30/2014</td>
<td>$66.73</td>
<td>$87.93</td>
<td>$105.13 H H D H D D D Y</td>
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</table>

*comment*

Four 10s allowed during the week preceding, following and/or the week of a holiday.

**Apprentice Rates:**

- 1st & 2nd periods: $26.93 $35.28 $42.28
- 3rd period: $28.93 $38.28 $46.28
- 4th period: $30.18 $40.16 $48.78
- 5th period: $31.43 $42.03 $51.28
- 6th period: $32.68 $43.90 $53.78
- 7th period: $33.93 $45.78 $56.28
- 8th period: $34.93 $47.28 $58.28
- 9th period: $35.93 $48.78 $60.28
- 10th period: $37.36 $50.92 $63.14

**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

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Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 11/19/2014
Contract must be awarded by: 2/17/2015

Page 23 of 29

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
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<td>Plasterer</td>
<td>Plasterer</td>
<td>BR1P</td>
<td>11/1/2012</td>
<td>$45.04 $67.56 $90.08 H H H H H D N</td>
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<tr>
<td>Apprentice Rates:</td>
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<td>$32.11</td>
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<td>3rd 6 months</td>
<td>$34.69</td>
<td>$52.04</td>
<td>$69.38</td>
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<td>4th 6 months</td>
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<td>$79.74</td>
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<td>6th 6 months</td>
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<td>$84.90</td>
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<td>9/8/2010</td>
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<td></td>
</tr>
<tr>
<td>Apprentice Rates:</td>
<td>4 tens allowed M-Th or T-F; OT of time and one half required on 11th &amp; 12th hour of any ten hour days</td>
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<tr>
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<td></td>
<td>Period 10</td>
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<td>$62.89</td>
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</table>

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County: Wayne

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**Contract must be awarded by:** 2/17/2015

### Classification Last Straight Time and a Double Overtime

<table>
<thead>
<tr>
<th>Name Description</th>
<th>Updated</th>
<th>Hourly</th>
<th>Half Time</th>
<th>Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roofer</strong></td>
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<td>Commercial Roofer</td>
<td>RO-149-WOM</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td><strong>H H D H H D N</strong></td>
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</tr>
<tr>
<td>Straight time is not to exceed ten (10) hours per day or forty (40) hours per week.</td>
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</tr>
<tr>
<td>Make up day allowed</td>
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</tr>
<tr>
<td><strong>Apprentice Rates:</strong></td>
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<td></td>
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</tr>
<tr>
<td>Apprentice 1</td>
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<td>Apprentice 6</td>
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<td>$41.87</td>
<td>$52.40</td>
</tr>
</tbody>
</table>

| **Sewer Relining** | | | | |
| Class I-Operator of audio visual CCTV system including remote in-ground cutter and other equipment used in conjunction with CCTV | SR-I | 11/3/2014 | $42.76 | $57.75 | $72.74 |
| | | | **H H H H H D N** | |
| Class II-Operator of hot water heaters and circulation system; water jetters; and vacuum and mechanical debris removal systems and those assisting. | SR-II | 11/3/2014 | $41.23 | $55.46 | $69.68 |
| | | | **H H H H H D N** | |

| **Sheet Metal Worker** | | | | |
| Sheet Metal Worker | SHM-80 | 9/9/2014 | $61.83 | $78.74 | $95.65 |
| | | | **H H D X H H D Y** | |
| A 4 10 schedule may be worked, 4 consecutive days Monday thru Friday. |

**Apprentice Rates:**

| 1st & 2nd Periods Indentured after 6-1-11 | $39.18 | $46.79 | $54.40 |
| 3rd & 4th Periods Indentured after 6-1-11 | $40.88 | $49.34 | $57.80 |
| 5th & 6th Periods Indentured after 6-1-11 | $42.56 | $51.86 | $61.16 |
| 7th & 8th Periods Indentured after 6-1-11 | $44.25 | $54.40 | $64.54 |
| 9th & 10th Periods Indentured before 6-1-11 | $51.92 | $64.44 | $76.96 |

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**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
**Project Number:** 511-228377  
**County:** Wayne

---

**Official Rate Schedule**  
Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
### Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
**Contract must be awarded by:** 2/17/2015

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Last Updated</th>
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<th>Double Time</th>
<th>Overtime Provision</th>
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<td>$66.48</td>
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</tbody>
</table>

*Make up day allowed*

### Sprinkler Fitter

**Sprinkler Fitter**  
SP 704  
10/1/2014  
$64.32 | $85.38 | $106.43 | H H D D D D Y |

4 ten hour days allowed Monday-Friday  
Double time pay due after 12 hours worked M-F

#### Apprentice Rates:

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<tr>
<th>Period</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
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</table>

#### Terrazzo

**Terrazzo Finisher**  
BR1-TRF  
10/17/2014  
$43.97 | $55.03 | $66.08 | H H D D D D D Y |

A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.

#### Apprentice Rates:

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<tr>
<th>Level</th>
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**Official Request #:** 1582  
**Requestor:** Wayne State University  
**Project Description:** Groundwater Infiltration Repairs & Landscaping  
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Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 11/19/2014
Contract must be awarded by: 2/17/2015

Page 26 of 29

<table>
<thead>
<tr>
<th>Classification</th>
<th>Name</th>
<th>Description</th>
<th>Updated</th>
<th>Last Updated</th>
<th>Straight Time and a Half Hourly</th>
<th>Double Time Hourly</th>
<th>Overtime Provision</th>
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A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.

Apprentice Rates:

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Tile

<table>
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<th>Double Time Hourly</th>
<th>Overtime Provision</th>
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A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.

Apprentice Rates:

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<th>$31.20</th>
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Tile Layer

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<th>Straight Time and a Half Hourly</th>
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<th>Overtime Provision</th>
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A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.

Apprentice Rates:

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<td>$44.78</td>
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<td>Level 3</td>
<td>$33.41</td>
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<td>$55.78</td>
<td>$67.88</td>
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Official Request #: 1582
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Project Description: Groundwater Infiltration Repairs & Landscaping
Project Number: 511-228377
County: Wayne
## Official 2014 Prevailing Wage Rates for State Funded Projects

**Issue Date:** 11/19/2014  
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<table>
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<th>Classification</th>
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<th>Description</th>
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<th>Straight Time</th>
<th>Half Hourly</th>
<th>Double Time</th>
<th>Overtime Provision</th>
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<tr>
<td><strong>Truck Driver</strong></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>on all trucks of 8 cubic yard capacity or less (except dump trucks of 8 cubic yard capacity or over, tandem axle trucks, transit mix and semis, euclid type equipment, double bottoms and low boys)</td>
<td>TM-RB1</td>
<td>8/8/2013</td>
<td>$41.92</td>
<td>$37.85</td>
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<td>of all trucks of 8 cubic yard capacity or over</td>
<td>TM-RB1A</td>
<td>8/8/2013</td>
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<td><strong>Underground Laborer Open Cut, Class I</strong></td>
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### Apprentice Rates:

- 0-1,000 work hours: $32.94, $41.26, $49.58
- 1,001-2,000 work hours: $33.90, $42.70, $51.50
- 2,001-3,000 work hours: $34.85, $44.13, $53.40
- 3,001-4,000 work hours: $36.76, $46.99, $57.22

**Underground Laborer Open Cut, Class II**

| | | | | | | | |
| | | Mortar and material mixer, concrete form man, signal man, well point man, manhole, headwall and catch basin builder, guard rail builders, headwall, seawall, breakwall, dock builder and fence erector. | LAUC-Z1-2 | 10/25/2013 | $37.83 | $48.60 | $59.36 | X | X | X | X | X | D | Y |

### Apprentice Rates:

- 0-1,000 work hours: $33.02, $41.38, $49.74
- 1,001-2,000 work hours: $33.98, $42.82, $51.66
- 2,001-3,000 work hours: $34.95, $44.27, $53.60
- 3,001-4,000 work hours: $36.87, $47.15, $57.44

---

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**County:** Wayne

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Page 27 of 29
### Underground Laborer Open Cut, Class III

Air, gasoline and electric tool operator, vibrator operator, drillers, pump man, tar kettle operator, bracers, rodder, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars, etc.), cement finisher, welder, pipe jacking and boring man, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tugger man, and directional boring man.

**Apprentice Rates:**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Straight Time</th>
<th>Half Time</th>
<th>Overtime Provision</th>
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<td>$41.44</td>
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<td>1,001-2,000 work hours</td>
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### Underground Laborer Open Cut, Class IV

Trench or excavating grade man.

**Apprentice Rates:**

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<thead>
<tr>
<th>Hours</th>
<th>Straight Time</th>
<th>Half Time</th>
<th>Overtime Provision</th>
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<td>$57.68</td>
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### Underground Laborer Open Cut, Class V

Pipe Layer

**Apprentice Rates:**

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<th>Hours</th>
<th>Straight Time</th>
<th>Half Time</th>
<th>Overtime Provision</th>
</tr>
</thead>
<tbody>
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<td>2,001-3,000 work hours</td>
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</table>
### Underground Laborer Open Cut, Class VI
Grouting man, top man assistant, 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.

**Classification Last Straight  Time and  a Double  Overtime**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Updated</th>
<th>Hourly</th>
<th>Half Time</th>
<th>Time</th>
<th>Provision</th>
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</tr>
</tbody>
</table>

**Apprentice Rates:**

- 0-1,000 work hours $31.25 $38.73 $46.20
- 1,001-2,000 work hours $32.10 $40.00 $47.90
- 2,001-3,000 work hours $32.94 $41.26 $49.58
- 3,001-4,000 work hours $34.63 $43.79 $52.96

### Underground Laborer Open Cut, Class VII
Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes, flagstones etc.

**Classification Last Straight  Time and  a Double  Overtime**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Updated</th>
<th>Hourly</th>
<th>Half Time</th>
<th>Time</th>
<th>Provision</th>
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<tbody>
<tr>
<td>LAUC-Z1-7</td>
<td>9/5/2013</td>
<td>$32.09</td>
<td>$39.99</td>
<td>$47.88</td>
<td>X X X X X X D Y</td>
<td></td>
</tr>
</tbody>
</table>

**Apprentice Rates:**

- 0-1,000 work hours $28.72 $34.93 $41.14
- 1,001-2,000 work hours $29.39 $35.93 $42.48
- 2,001-3,000 work hours $30.07 $36.95 $43.84
- 3,001-4,000 work hours $31.42 $38.98 $46.54

---

**Official Request #:** 1582

**Requestor:** Wayne State University

**Project Description:** Groundwater Infiltration Repairs & Landscaping

**Project Number:** 511-228377

**County:** Wayne

---

**Official Rate Schedule**

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.
WAYNE STATE UNIVERSITY
PAYMENT PACKAGE DOCUMENT REQUIREMENTS (Revised 5-06-2011):

Review and comply with Section 410 of Bid Front End Documents.
Review and comply with Article 15 of the Supplemental General Conditions.

AIA DOCUMENT G702 & G703 – (or facsimile thereof) Payment Application Checklist:

- Correct Project Name – Found on your contract.
- Correct Project Number – Found on your contract.
- Purchase Order Number – Required prior to beginning work.
- Correct Application Number. (i.e. 1, 2, 3, etc.)
- Correct Period Reporting Dates – Applications support docs must be sequential and within application range.
- Approved & Executed Change Orders must be listed. (Cannot invoice for unapproved changes.)
- Schedule of values percentages and amounts match the approved Pencil Copy Review – Signed by the Architect, Contractor, and University Project Manager.
- Correct Dates – Back dating not accepted.
- Signed and Notarized.

SWORN STATEMENT – Checklist:

- List all contractors, sub-contractors, suppliers... ≥ $1000.00
- Contractor’s Sworn Statement amounts must coincide with Column “C” of the schedule of values document. Any unassigned or uncommitted value of contract shall be shown on an entry “Contractor – Unassigned” followed by the amount necessary to cause the „contracted to date” column of the sworn statement to equate with the schedule of value column totals.
- Current Date – Back dating not accepted.
- Signed and Notarized.

A Sworn Statement is required from every Sub Contractor on the job with a material purchase or sub-subcontract of $1,000 or more. (all the way down to the bottom tier)

DEPT. of LABOR FORM WH-347 – Certified Payroll Checklist:
(Union and Non-Union)

- For every contractor & sub-contractors work, for each week within the application for payment reporting period. (For every „boot” on the floor representing the weeks within the application period)
- Wayne State University Project Number – Found on your contract.
- List ALL workers who have worked on the project site.
- Make sure workers addresses are listed.
- NO Social Security Numbers, if present they MUST be blackened out or listed in XXX-XX-1234 format.
- Work classifications based on the job specific Prevailing Wage Schedule descriptions. If you require rates for additional classifications, contact the Michigan Department of Consumer & Industry Services. (Refer to Section 410 of Bid Front End Documents.)
  http://www.cis.state.mi.us/bwuc/bsr/wh/revised_rates/whc_tbl.htm
- Apprenticeship program status – proof of enrolled program and current completion required for any workers paid at Apprenticeship rates.
- Rate of Pay verified against the Prevailing Wage Schedule with an hourly costs breakdown of fringes paid. (Refer to attachment for State of Michigan instructions and example)
- Authorized signatures on affidavit.

APPLICATION PACKAGE SUPPORTING DOCUMENTATION –
Must accompany all package reporting periods: (Union and Non-Union)

- Copies of Pay Stubs may be required for each Certified Payroll period reported – (Social Security Numbers MUST be blackened out or listed in XXX-XX-1234 format. Pay stubs need to reflect claimed participation of fringes like Medical, Dental, Retirement or 1099 classification.)
- Proof of Ownership for any „Owner Operator” (Sole Proprietor) contractors not claiming their time under prevailing wage act. – (Must list their hours and dates worked on the WH-347 Form and enter EXEMPT on the income brackets.). The Owner Operator must provide copies of “DBA” registration form confirming status as exempt from prevailing wage requirements.
Proof of Stored Materials – (Detailed Bill of Sale, certificate of insurance or endorsement page specifically insuring the stored materials, pictures, when large value. WSU reserves the right to on site verification of material. Stored material must be separated from ordinary inventory and labeled for WSU project.

Partial Unconditional Waivers – Must release the accumulated amount paid for work and be immediately provided, or provided with the subsequent application for payment. Waivers shall be provided for contractors, sub-contractors, and suppliers listed on the Sworn Statements. (This is required at all tiers)

Full Unconditional Waivers – Prime Contractor must deliver fully executed Full Unconditional Waiver upon receipt of final payment. Full Unconditional waivers may be required of sub-contractors and suppliers in advance of final Contractor payment on bonded projects. This requirement shall be determined on a project-by-project basis. Full Unconditional waivers shall be required in advance of or at the time of final payment on all non-bonded projects from all subcontractors and suppliers listed on Sworn Statements, or who have provided a notice of furnishing.

Partial Conditional Waivers – The Contractor shall provide a Partial Conditional Waivers covering the entire amount of the application for payment. For non-bonded Projects – A partial conditional waiver from all subcontractors must accompany any application for payment within which a subcontractor draw is included.

Sworn Statements – Required for all Sub Contractors, and Sub-subcontractors (etc.) with any contracts or purchases exceeding $1,000.

**FINAL PAYMENT EXCHANGE – Checklist:**

- Clear and concise As-Built drawings.
- Operation and Maintenance Manuals.
- Required training must be completed (if applicable).
- Warranty of work in accordance with project documents.
- Certificate of Substantial Completion.
- Full Unconditional Waiver

The Project Manager may provide additional requirements as may apply to individual jobs

Revised 5-6-2011
AGREEMENT BETWEEN THE UNIVERSITY AND CONTRACTOR
FOR CONSTRUCTION SERVICES (rev 6-2013)

Executed as of the _____ day of _________, 2014 by and between:

The Board of Governors, Wayne State University
Detroit, Michigan 48202
(The University)

and

CONTRACTOR’S NAME
CONTRACTOR’S ADDRESS

regarding

Freer Ground Water Infiltration 2014
71 East Ferry
WSU Project No. 511-228377
In consideration of the mutual covenants and conditions contained herein, the Parties agree as follows:

**Article 1 - Scope of Work**

1.1 This Agreement provides for *Groundwater Infiltration repairs and new landscaping*, located at 71 East Ferry. The documents listed in Article 4 fully define the scope of work.

1.2 The Contractor shall furnish all the labor, materials, equipment, services, and supervision to perform all the work shown on the drawings and specifications listed in Article 18, including any addenda issued during the bid phase, and approved change orders issued during the construction phase.

1.3 The Contractor shall notify the University in writing within five (5) calendar days when the Contractor discovers any condition that will affect the contract amount or the completion date.

**Article 2 - Time of Completion**

2.1 The work to be performed under this Agreement shall commence upon the Contractor’s receipt of a fully-executed Agreement, and substantial completion shall be achieved by *August 31, 2015*.

**Article 3 - The Contract Sum**

3.1 The University shall pay the Contractor a "lump sum/not-to-exceed (pick one)" amount of $\text{________}$ ("Amount in words \text{________} /100 dollars) for the performance of all work associated with the Contractor’s Base Bid "and Alternates (List)".

3.2 The University may, at its sole discretion, during the life of the contract, award the following alternates at the amounts indicated: 

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate #1 Demolition of existing gate and fence at</td>
<td></td>
</tr>
<tr>
<td>areaway. Fabrication and installation of new fence and</td>
<td></td>
</tr>
<tr>
<td>gate per plan and details refer to detail #9, sheet A101.</td>
<td></td>
</tr>
</tbody>
</table>

3.3 In the event additional work becomes necessary, the following unit prices will apply:

(If section 3.3 is not used, delete all text and enter Deleted)

**Article 4 - The Contract Documents**

4.1 The Contract Documents shall consist of this Agreement, the drawings and specifications as listed in Article 18, the General Conditions of the Contract for Construction as defined by AIA Document A201 1970 Edition, except as otherwise provided herein, and Wayne State University’s *Supplementary General Conditions 1997 Edition*.

4.2 For any inconsistencies found among or between these Contract Documents, the language contained in this Agreement shall prevail over all other documents and the Supplementary General Conditions shall prevail over the General Conditions. In the event of a conflict between the Drawings and Specifications, the requirement for the higher quantity and/or higher quality shall prevail.

**Article 5 – Examination of Premises**

5.1 The Contractor acknowledges that the University provided the opportunity for a thorough examination of the project site and its surroundings and that the Contractor knows of no conditions preventing accomplishment of the full scope of work within the time and for the amount specified in this Agreement.
5.2 The University will deny all claims for additional time and/or cost for conditions that could have been reasonably discovered during such an examination.

Article 6 - The Architect/Engineer

6.1 The Architect/Engineer for this project is:
"(List the Architect and Engineer separately if appropriate)"

Grissim Metz Andriese
300 Cady Street
Northville MI 48167
(Architect Phone No / Fax No)

6.2 The University will appoint a Project Manager who will be the University's point of contact for all matters of contract administration including, but not limited to, interpretation of documents, defining the scope of work, approving work schedules, and approving contract payments.

Article 7 - Additional Work

7.1 The University reserves the right to let other Agreements in connection with this work. The Contractor will afford other Contractors or the University’s own workforce reasonable opportunity for the delivery and storage of their material and for the performance of their work and shall properly connect and coordinate its work with theirs.

7.2 If any part of the Contractor's work depends for proper execution or results upon the work of another Contractor or the University's own workforce, the Contractor shall inspect and promptly report to the University's Project Manager any defects in such work that render it unsuitable for such proper execution and results. The Contractor's failure to so inspect and report shall constitute an acceptance of the work of others as fit and proper for reception of the Contractor's work and as a waiver of any claim or defense against the University or other contractor which relies in whole or in part upon the contention that such work was unsuitable for proper execution and resolution.

Article 8 – Dispute Resolution

8.1 Jurisdiction over all claims, disputes, and other matters in question arising out of or relating to this contract or the breach thereof, shall rest in the Court of Claims of the State of Michigan. No provision of this agreement may be construed as Wayne State University’s consent to submit any claim, dispute or other matter in question for dispute resolution pursuant to any arbitration or mediation process, whether or not provisions for dispute resolution are included in a document which has been incorporated by reference into this agreement. Specifically, all references to Arbitration contained in the General Conditions are superceded by this Article.

8.2 In any claim or dispute by the Contractor against the University, which cannot be resolved by negotiation, the Contractor shall submit the dispute in writing for an administrative decision by the University's Vice President for Finance and Administration, within 30 days of the end of negotiations. Any decision of the Vice President shall be made within 45 days of receipt from the Contractor and is final unless it is challenged by the Contractor by filing a lawsuit in the Court of Claims of the State of Michigan within one year of the issuance of the decision. The Contractor agrees that appeal to the Vice President is a condition precedent to filing suit in the Michigan Court of Claims.

8.3 For purposes of this section, the “end of negotiations” shall be deemed to have occurred when:

8.3.1 Either party informs the other that pursuant to this section, negotiations are at an impasse; or

8.3.2 The Contractor submits the dispute in writing to the Vice President.
8.4 Unless otherwise agreed by the University in writing, and notwithstanding any other rights or obligations of either of the parties under any Contract Documents or Agreement, the Contractor shall continue with the performance of its services and duties during the pendency of any negotiations or proceedings to resolve any claim or dispute, and the University shall continue to make payments in accordance with the Contract Documents; however, the University shall not be required or obligated to make payments on or against any such claims or disputes during the pendency of any proceeding to resolve such claims or disputes.

**Article 9 - Termination for Convenience**

9.1 Upon thirty days written notice to the Contractor, the University may, without cause and without prejudice to any other right or remedy of the University, elect to terminate the contract. In such case, the Contractor shall only be paid (without duplication of any items), using a Close out Change Order, for the following:

9.1.1 For completed and acceptable work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

9.1.2 For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted work, including fair and reasonable sums for overhead and profit on such expenses.

9.2 The Contractor shall not be paid on account of loss of anticipated profits or revenue, delay or disruption, or other economic loss arising out of or resulting from such termination. For purposes of this section, "fair and reasonable sums for overhead and profit" shall be determined by reference to Michigan law, without reference to principles used for such determinations in arbitration.

**Article 10 - Progress Payments**

10.1 On or before the 20th day of each month, the Contractor shall submit a written application for payment, using form AIA G702, to the Architect/Engineer and the University’s Project Manager for review. The Architect/Engineer shall have ten (10) calendar days to accept or reject the Contractor’s application for payment. Acceptable applications for payment shall then be submitted to the University for Payment of authorized amount(s) within thirty (30) calendar days of receipt by the University’s Project Manager.

10.2 The application for payment shall contain a full schedule of values organized and sorted by subcontractor, by Construction Specifications Institute standard work categories, or in another format acceptable to the University.

10.3 Monthly progress payments shall show the percentage of work installed as of the date of the application, less amount previously installed and the amount due for the application period. The Contractor shall deduct a 10% retainage from the balance due for each progress payment and indicate the net amount due on each application.

10.4 When 50% of the work associated with this Agreement is installed, the Contractor shall not deduct additional retainage from the balance due from the University. When substantial completion is achieved and acknowledged by the Architect/Engineer, the Contractor and the University in writing, the University shall remit to the Contractor all but 2% of the retainage. The remaining 2% shall be retained by the University until the final payment is authorized and remitted to the Contractor.

**Article 11 - Acceptance and Final Payments**

11.1 Final payment shall be due thirty (30) days after the completion of the work, including all punch list items, provided the work is fully completed and the Agreement fully performed.

11.2 Upon receipt of written notice that the work is ready for final inspection and acceptance, the Architect/Engineer shall promptly inspect the work. When the Architect/Engineer concludes that the work is acceptable and the Agreement to be fully performed, the Architect/Engineer shall promptly issue a final certificate with an original signature, stating that the work provided is complete and acceptable and that the entire remaining balance found to be due the Contractor shall be remitted by the University once the final
application for payment is received.

11.3 If, after the work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and the Architect/Engineer so certifies, the University shall, upon certificate of the Architect/Engineer, and without terminating the Contract, make payments of the balance due for that portion of the work fully completed and accepted. Such payments shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Article 12 - Non-Discrimination

12.1 The Contractor agrees that it will not discriminate against any employee or applicant for employment, to be employed in the performance of this Agreement, with respect to hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment, because of race, color, religion, sex, age, national origin, or ancestry. Breach of this covenant may be regarded as material breach of this Agreement.

12.2 The Contractor further agrees that it will, in all subcontracts relating to the performance of the work under this Agreement, provide in its subcontracts that the subcontractor will not 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 race, sex, age, color, religion, national origin or ancestry. Breach of this covenant may also be regarded as a material breach of this Agreement.

Article 13 – Laborers and Mechanics

13.1 All laborers and mechanics must be covered by Worker’s Compensation and Employer’s Liability Insurance as required by Federal and Michigan law. The Contractor shall also require all of its Subcontractors to maintain this insurance coverage.

13.2 The Contractor acknowledges and shall abide by the University’s prohibition on use of 1099 independent contractors and owner / operator business entities. The Contractor shall ensure that all classifications of laborers and construction mechanics performing Work on the Project job site are employees of the Contractor or any Trade Contractor for any tier thereof, and that each worker is covered by workers compensation insurance.

Article 14 - Prevailing Wages

14.1 The Contractor and each subcontractor shall pay to each class of mechanics and laborers not less than the wage and fringe benefit rates prevailing in the Detroit Metropolitan Area, as determined by the United States Department of Labor. The Contractor shall post on site, in a conspicuous place, a copy of all applicable wage and benefit rates, and shall provide the University with a copy of the applicable wage and benefit rates.

14.2 The Contractor and each subcontractor shall keep an accurate record showing the name and occupation of and the actual benefits and wages paid to each laborer and mechanic employed in connection with this contract. The Contractor and each subcontractor shall make certified payroll records available to the University’s representatives upon request.

14.3 If a Contractor or subcontractor fails to pay the prevailing rates of wages and fringe benefits and does not cure such failure within ten (10) days after notice to do so by the University, the University shall have the right, at its option, to do any or all of the following:

14.3.1 Withhold all or any portion of payments due the Contractor as may be considered necessary by the University to pay laborers and mechanics the difference between the rates of wages and fringe benefits required by this Agreement and the actual wage and fringe benefits paid.

14.3.2 Terminate part or all of this Agreement or any subagreement and proceed to complete the
Agreement or subagreement by separate agreement with another Contractor or otherwise, in which case the Contractor and its sureties shall be liable to the University for any excess costs incurred by the University.

14.4 The Contractor shall include terms identical or substantially similar to this section in any Agreement or subagreement pertaining to the project.

Article 15 - Save Harmless

15.1 The Contractor shall indemnify, defend and hold harmless the University, its agents and employees from any and all loss, damage, claims, and causes of action whatsoever, including all costs, expenses and attorneys’ fees arising out of Contractor’s performance of obligations under the terms and conditions of this agreement. Such responsibility shall not be construed as liability for damage caused by or resulting from the negligence of the University, its agents other than the Contractor, or its employees.

Article 16 - Liquidated Damages

16.1 It is understood and agreed that, if the project is not completed within the time specified in the Agreement plus any extension of time allowed pursuant thereto, the actual damages sustained by the University because of any such delay will be uncertain and difficult to ascertain, and it is agreed that the reasonable foreseeable value of the use of said project by the University would be the sum of $500.00, five hundred Dollars per day. Therefore, the Contractor shall pay as liquidated damages to the University the sum of $500.00, five hundred Dollars per day for each day’s delay in substantially completing said project beyond the time specified in this Agreement and any extensions of time allowed thereunder.

"ENTER N/A FOR ABOVE AMOUNT IF NO LIQUIDATED DAMAGES"

Article 17 - Interpretation

17.1 This Agreement shall be interpreted and construed according to the laws of the State of Michigan.

17.2 If one part of this Agreement is found to be void by legal or legislative action, the remainder of the contract remains in full effect.
Article 18 - Drawings and Specifications

18.1 The Technical Specifications and the Project Manual dated **January 9, 2015**, and the following List of Drawings represents the scope of work as defined in the Contract Documents from Article 4.

### DRAWINGS

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<thead>
<tr>
<th>Drawing No.</th>
<th>Description</th>
<th>Date</th>
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<tr>
<td>Drawings Cover, Survey (3) dated January 9, 2015</td>
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<tr>
<td>L101</td>
<td>Demolition Plan</td>
<td>January 9, 2015</td>
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<tr>
<td>L102</td>
<td>Layout/Paving Plan</td>
<td>January 9, 2015</td>
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<tr>
<td>L103</td>
<td>Grading/Drainage Plan</td>
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<tr>
<td>L104</td>
<td>Landscape Plan</td>
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<td>L501</td>
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<td>A101</td>
<td>Architectural Details</td>
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<td>D2</td>
<td>Sewer Details</td>
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<td>E101</td>
<td>Electrical Site Plan and Details</td>
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Technical Specifications

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<tr>
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<td>Alternates</td>
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<td>013323</td>
<td>Shop Drawings, Product Data and Samples</td>
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<td>015639</td>
<td>Tree and Plant Protection</td>
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<td>023000</td>
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<td>Electrical Conductors</td>
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<td>Grounding for Electrical Systems</td>
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<td>260529</td>
<td>Hangers and Supports for Electrical Systems</td>
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<td>260533</td>
<td>Raceway and Boxes for Electrical Systems</td>
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<td>Lighting Control Devices</td>
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<td>Earthwork for Site</td>
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<td>Soil Erosion and Sedimentation Control</td>
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<td>Landscape Maintenance and Warranty Standards</td>
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<td>Flagstone Paving (Dry Set)</td>
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<td>Asphalt Concrete Paving</td>
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<td>Exposed Aggregate Concrete Paving</td>
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<td>Steel Ornamental Picket Fencing and Gates</td>
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<td>329223</td>
<td>Sodding</td>
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<tr>
<td>329300</td>
<td>Plants</td>
</tr>
<tr>
<td>334000</td>
<td>Storm Drain Facilities</td>
</tr>
<tr>
<td>334600</td>
<td>Underdrainage</td>
</tr>
</tbody>
</table>
Sample
IN WITNESS WHEREOF the parties to these presents have hereunto set their hands as of the day and year first written above.

Signed, sealed and delivered in the presence of:

CONTRACTOR’S NAME GOES HERE

By__________________________________
signature

Please print name here

Date signed

Title

Witness

THE BOARD OF GOVERNORS of WAYNE STATE UNIVERSITY

By_______________________________

Richard J. Nork, Vice President for Finance and Facilities

Date signed

Form Contract Approved by OGC 06/13 – LG File_reference_here
FORM OF GUARANTEE

PROJECT: Freer Ground Water Infiltration 2014

OWNER: BOARD OF GOVERNORS, WAYNE STATE UNIVERSITY

CONTRACTOR: ________________________________

DATE: ________________________________

Know all men by these presents that, in consideration of my (our) having been awarded the Contract or Subcontract for complete furnishing and installation of:

Freer Ground Water Infiltration 2014 (511-228377)

For: Board of Governors, Wayne State University

In conformity with drawings and specifications prepared by Architect or Engineer, Grissim Metz Andriese, and known as the buildings indicated above, I (we) do hereby agree that, should I (we) be notified that the said work has proved faulty, etc., that I (we) will return to the buildings within three (3) working days of the receipt of such notice, and will furnish the necessary labor and material to repair such work to the satisfaction of the Owner and without cost to the Owner.

The Agreement shall remain in full force and effect for a one year period (DATE TBD)

WITNESS:

signed:__________________________________

Subcontractor

by:______________________________________

address:______________________________

city/state/zip:________________________

signed:______________________________

General Contractor

by:____________________________________

(THESE FORM TO BE FILED IN DUPLICATE.)
GENERAL CONDITIONS (Revised 10-2009)

A. Although AIA Document A201 - Twelfth Edition (April 1970) - "General Conditions of the Contract for Construction" is not bound herein, it forms a part of these construction documents.

B. A reference copy of AIA Document A201 - Twelfth Edition (April 1970) - "General Conditions of the Contract for Construction" is on file at the following location:

Wayne State University
Finance & Facilities Management
Procurement & Strategic Sourcing
Academic / Administrative Services Building
5700 Cass Avenue
Detroit Michigan 48202
SUPPLEMENTARY GENERAL CONDITIONS

OF

THE CONTRACT FOR CONSTRUCTION

Facilities Planning & Management - Design & Construction Services
Wayne State University
WSU SUPPLEMENTARY GENERAL CONDITIONS
OF THE
CONTRACT FOR CONSTRUCTION

NOTE: The following items related to A.I.A. General Conditions, A.I.A. Document A-201 - Twelfth Edition (April 1970), by specific number being amended to. These items, as amendments, shall have precedence over the article being amended.

ARTICLE 1 - CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.5 The Agreement

The Agreement executed by the Contractor and the Owner.

1.2 EXECUTION, CORRELATION, INTENT, AND INTERPRETATIONS

1.2.6 "General Conditions and "Supplementary General Conditions" apply with equal force to all Contractors, Subcontractors work, and extra work required under this Contract.

1.2.7 Precedence of Drawings and Specifications.

The Agreement has precedence over WSU Supplementary General Conditions.

WSU Supplementary General Conditions have precedence over A.I.A. A-201 General Conditions of the Contract.

Specifications have precedence over drawings. Full-size drawings have precedence over scale drawings. Large-scale plans and details have precedence over small-scale plans and details. Figured dimensions have precedence over plans and elevations.

ARTICLE 2 - ARCHITECT

2.1 DEFINITION

2.1.1.1 The term Architect or Architect/Engineer as used in these specifications refers to Facilities Planning and Management - Design Services, and/or Consulting Architect/Engineer.

2.2 ADMINISTRATION OF THE CONTRACT

2.2.16 The Architect will assign Field Representatives to make periodic visits to the project for the purpose of assisting the Architect in carrying out his field responsibilities at the site. The duties, responsibilities and limitations of authority of any such Field Representative shall be as follows:

a. Explain Contract Documents: Assist the Contractor via the Contractor's Superintendent to understand the intent of the Contract Documents.

b. Observations: Conduct on-site observations and spot checks of the work in progress as a basis for determining conformance of the work, material, and equipment with the Contract Documents.

c. Additional Information: Obtain from the Architect, additional details or information, if and when required, at the job site for proper execution of the work.

 d. Modifications: Consider and evaluate suggestions or modifications that may be submitted by the Contractor and report them with recommendations to the Architect for final decision.

e. Construction Schedule and Completion: Be alert to the completion, and report same to the Architect. When the construction work has been completed in accordance with the Contract Documents, advise the Architect that the work is ready for general inspection and
f. Job Conferences: Attend and report to the Architect on all required conferences held at the job site.

g. Observe Tests: See that tests which are required by the Contract Documents are actually conducted; observe, record and report to the Architect all details relative to the test procedures; and advise the architect's office in advance of the schedules of tests.

h. Inspection by Others: If inspectors, representing local, state or federal agencies having jurisdiction over the project, visit the job site, accompany such inspectors during their trips through the project, record the outcome of these inspections, and report same to the Architect's office.

i. Shop Drawings: Do not permit the installation of any materials and equipment for which shop drawings are required unless such drawings have been duly approved and issued by the Architect.

j. Contractor's Requisitions for Payment: Review and make recommendations to the Architect for disposition.

k. List of Items for Correction: After substantial completion, make a list of items for correction before final inspection and check each item as it is corrected.

l. Owner's Occupancy of the Building: If the Owner occupies (to any degree) the building prior to actual completion of the work by the Contractor, be especially alert to possibilities of claims for damage to completed work prior to the acceptance of the building.

m. Owner Existing Operation: In the case of additions to or Demolitions of an existing facility, which must be maintained as an operational unit, be alert to conditions on the job site which may have an effect on the Owner's existing operation.

n. Limitations of Authority: Do not become involved in any of the following areas of responsibility unless specific exceptions are established by written instructions issued by the Architect.

   aa. Do not authorize deviations from the Contract Documents.

   bb. Avoid conducting any test personally.

   cc. Do not enter into the area of responsibility of the Contractor's field superintendent.

   dd. Do not expedite job for Contractor unless so instructed by the Architect.

   ee. Do not advise on or issue directions relative to any aspect of the building technique or sequence unless a specific technique or sequence is called for in the Specifications or by written instructions from the Architect.

   ff. Do not approve shop drawings or samples.

   gg. Do not authorize or advise the Owner to occupy the Project, in whole or in part, prior to the final acceptance of the building.

   hh. Do not issue a Certificate for Payment.

ARTICLE 3 - OWNER

3.5 OWNER'S RIGHT TO DO WORK

3.5.1 The Owner may exercise his right, which is hereby acknowledged by the Contractor, to let independent of the Contract for the work herein specified, any other work on the premises even if of
like character and trades, and the Owner shall not be liable for any damage, loss or expense incurred by the Contractor through the fault of any other Contractor so employed by the Owner. The Contractor acknowledges the necessity of work by others, to be performed at approximately the same time as the work hereunder, and agrees to perform his work in full cooperation with the work of such other trades and/or Contractors, partially or entirely completed, by such other trades and/or Contractors, or by the Owner, when, in the opinion of the Architect, such access or use is necessary for the performance and completion of any portion or all of the work of others or of any work on the site.

3.6

OWNER'S ACCESS AND PARTIAL OCCUPANCY

3.6.1 The Owner shall have access to the work at all times, and at his election, may from time to time (prior to the stipulated contract completion date) occupy any of the units or parts of the project as the work in connection therewith is complete to such a degree as will, in the opinion of the Owner, permit their temporary or permanent use. The Owner will, prior to any such partial occupancy, give notice to the Contractor thereof and such occupancy shall be upon the following terms:

a. Such occupancy shall not constitute an acceptance of work not performed in accordance with the Contract nor shall such occupancy relieve the Contractor of liability to perform any work by the Contract by not complete at the time of occupancy.

b. Except as otherwise provided by an agreement at the time of such partial occupancy, the Contractor shall be relieved of all maintenance costs on units or parts so occupied.

c. The Contractor shall not be responsible for wear and tear or damage resulting from partial occupancy.

d. The Owner shall assume risk of loss with respect to any unit or part so occupied.

e. The Contractor shall, if required by the Owner, furnish heat, light, water, or other such services to the units or parts occupied and the Owner shall make proper remuneration therefore to the Contractor.

3.6.2 The Contractor agrees that the Owner shall have the right, after seven (7) days' written notice to the Contractor, to place and install as much equipment and machinery during the progress of the work as is possible before the completion of the various parts of the work; and further agrees that such placing and installation of equipment shall not in any way evidence the completion of the work or any portion thereof, nor signify the Owner's acceptance of the work or any portion thereof. Should the Owner place or install such equipment and machinery with his own forces he shall be responsible for any damage to work of the Contractor caused by the Owner's work or workmen. Should the Owner have such placement or installation performed by another Contractor, then the Owner shall require said Contractor to be responsible for all such damage caused by his work, his workers, or his subcontractors.

ARTICLE 4 - CONTRACTOR

4.4 LABOR AND MATERIALS

4.4.3 All materials shall be so delivered, stored and handled to prevent the inclusion of foreign materials and the damage of materials by water or breakage. Packaged materials shall be delivered and stored in original packages until ready for use. Packages or materials showing evidence of water or other damage shall be rejected. All materials shall be of the respective qualities specified herein.

4.4.4 The Contractor shall be responsible for the proper care and protection of all his materials, equipment, etc., delivered at the site. Building materials, equipment, etc., may be stored on the premises subject to the approval of the Architect.

4.4.5 To insure timely availability of critical materials in case of national emergency, the Contractor may order his subcontractors to proceed with fabrication of the same earlier than required by normal sequence of construction. In the event storage facilities are not available on the site or at the source of fabrication, the Owner will endeavor to provide such storage space as may be available to care for same. Where this is necessary, the Contractor shall be paid for all stored material on the
Owner's property or on the properties approved by the Owner upon approval of certified invoices. It shall be the Contractor's obligation to pay for all handling costs and damage to this material. The Contractor shall protect this property against damage.

4.6 TAXES

4.6.1 The Bidder shall include in his proposal and make payment of all Federal, State, County and Municipal taxes including Michigan State Sales and Use Taxes, now in force or which may be enacted during the progress and completion of the work covered.

4.7 PERMITS, FEES AND NOTICES

4.7.3 The Contractor shall pay highway or DPW fees for damages to sidewalks, streets, or other public property or to any public utilities.

4.7.4 Permits and licenses of a temporary nature necessary for the execution of the work shall be secured and paid for by the Contractor.

4.7.5 Except for the General Building Permit (which is not required), the Contractor shall secure and pay for all other required permits, including the following:

- Electrical - State of Michigan
- Plumbing - State of Michigan
- Mechanical - State of Michigan
- Elevator - City of Detroit

4.7.6 The Contractor shall secure certificates of inspection and of occupancy that may be required by authorities having jurisdiction over the work. These certificates shall be delivered to the Architect upon completion of the work.

4.9 SUPERINTENDENT

4.9.2 The Contractor shall give sufficient supervision to the work, using his best skill and attention. He shall carefully study and compare all drawings, specifications, and other instructions, and shall at once report to the Architect any error, inconsistency, or omission which he may discover, but he shall not be held responsible for their existence or discovery.

4.9.3 The Contractor's superintendent shall periodically inspect the entire project to make certain that all of the stipulations of all of the articles of the General Conditions are being observed.

4.12 DRAWINGS AND SPECIFICATIONS AT THE SITE

4.12.1.1 Refer to Paragraph 4.12.1, of A.I.A. General Conditions of the Contract for Construction. Modify the last sentence of this paragraph to read:

"The Drawings, marked to record all changes made during construction, shall be incorporated in the Contractor's 'Informational Package'."

4.12.2 As a basic and interim step for the fulfillment of the "Informational Package", accurate records of all non-structural underground and concealed work shall be kept, including, but not limited to, all piping, conduit, equipment, and drainage and tunnel work. In addition, such records shall be available for review during various steps of the project.

4.13 SHOP DRAWINGS AND SAMPLES
4.13.9 Immediately before and as a condition of substantial completion, the Contractor shall provide the Owner an "Informational Package" and instructional sessions on the operation, maintenance, and service of the facility. The "Informational Package" shall include:

1. One (1) set of transparency (sepia) of the approved shop drawings and descriptive material submitted during construction. Any shop documents unobtainable in sepia shall be supplied in three (3) sets.

2. One (1) set of transparency (sepia) of constructional shop drawings with all installation revisions incorporated to reflect the as-built condition. Examples of constructional shop drawings are dimensioned conduit, piping and ductwork layout drawings.

3. Three (3) sets of instructional manuals on the installation, operation, maintenance and service of equipment and systems, including parts lists.

Examples of Specific Information Required:

1. **Electrical**
   a. Conduit layout of light, power, and special systems, indicating dimensionally the locations and size of runs; circuit grouping and conductor size and number in conduit runs.
   b. System description and elementary diagrams, connection and interconnection diagrams, and device internal diagrams.

2. **Mechanical**
   a. Piping and ductwork layout indicating dimensionally the location and size of the runs.
   b. Description and diagrams of control systems.

Following the submittal of the "Informational Package", the Contractor shall schedule and provide, at the Owner’s convenience, instructional sessions for Owner’s personnel to acquaint them with the operation, maintenance, and service of the system.

3. **Elevators**
   a. Elementary diagrams and description of sequence of operation of the system control components, connection and interconnection diagrams, and device internal diagrams.

**ARTICLE 5 - SUBCONTRACTORS**

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.3 Delete Article 5.2.3 in its entirety.

5.2.4 Delete Article 5.2.4 in its entirety.

**ARTICLE 7 - MISCELLANEOUS PROVISIONS (Revised 6-13-2011)**

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The successful Bidder will be required to furnish a Performance Bond and Labor and Material Payment bond in an amount equal to 100% of the contract award amount, and include such cost in the Proposal, complying with the laws of the State of Michigan. The graduated formula no longer applies.
A. Performance Bond and Labor and Material Payment Bond shall be from a surety company acceptable to the Owner and made payable as follows:

(1) A Labor and Material Payment bond for 100% of the contract award amount to the Board of Governors of Wayne State University, and guaranteeing the payment of all subcontractors and all indebtedness incurred for labor, materials, or any cause whatsoever on account of the Contractor in accordance with the laws of the State of Michigan relating to such bonds.

(2) A Performance bond for 100% of the contract award amount to the Board of Governors of Wayne State University to guarantee and insure the completion of work according to the Contract.

B. The only acceptable Performance Bond shall be the AIA A312 – 2010.

C. The Contractor shall include with his bid evidence of his ability to obtain a Performance Bond in the amount of 100% of the bid amount, and in accordance with the terms and conditions outlined in this section. Such evidence shall be project specific and shall be submitted on a form provided by the Surety or Agent thereof.

7.7 ROYALTIES AND PATENTS

7.7.1 The Contractor hereby agrees to indemnify, protect and save harmless the Architect and the Owner from and against any and all liability, loss or damage, and to reimburse the Owner and the Architect for any expenses, including legal fees and disbursements to which the Owner or the Architect may be put because of claims of litigation on account of infringement or alleged infringement of any letters patent or patent rights by reason of the work or materials, equipment, or other items used by the Contractor in its performance.

7.9 INTEREST

7.9.1 Delete Article 7.9 in its entirety.

ARTICLE 8 - TIME

8.1 DEFINITIONS

8.1.3 The Date of Substantial Completion of the Work is the Date certified by the Architect when construction of the entire work is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the Work for the use for which it is intended. It is the beginning date for the guarantees on all the Project Work.

8.3.5 LIQUIDATED DAMAGES

It is understood that if said Contract is not completed within the time specified in the Contract plus any extension of time thereto, the Contractor shall pay Liquidated Damages to the Owner as set forth in Article 11 of the Agreement between Contractor and Owner for Construction.

ARTICLE 9 - PAYMENT AND COMPLETION

9.3 PROGRESS PAYMENTS

9.3.1 On or before the 20th day of each month, the Contractor shall submit to the Architect on the Owner's Standard Form, a written application for payment showing the proportionate value of the work installed to date from which shall be deducted, a reserve of 10% and all previous payments, and the balance of the amount as approved by the Architect shall be due and payable to the Contractor on or about the 15th day of the succeeding month.

9.3.2.2 No payments will be made because of materials or equipment stored off the site, except as provided for in Subparagraph 4.4.5 of the Supplementary General Conditions or other special cases the Owner may approve.

9.6 FAILURE OF PAYMENT
ARTICLE 11 - INSURANCE (Revised 3-22-2012)

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than any limits of liability specified herein, or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 4.18.

During the life of the Contract, the Contractor shall maintain the following types of insurance:

A. General Requirements

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Minimum Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Comprehensive General Liability</td>
<td>Bodily Injury $ 500,000 each person $1,000,000 aggregate</td>
</tr>
<tr>
<td></td>
<td>Property Damage $ 500,000 each occurrence $1,000,000 aggregate or $2,000,000 combined single limit (CSL)</td>
</tr>
<tr>
<td>2.Fire Legal Liability</td>
<td>$ 100,000</td>
</tr>
<tr>
<td>3.Comprehensive Automobile Liability (including Hired and non-owned vehicles)</td>
<td>Bodily Injury $ 500,000 each person $1,000,000 each accident or $2,000,000 combined single limit (CSL)</td>
</tr>
<tr>
<td></td>
<td>Property Damage $ 500,000 each accident</td>
</tr>
<tr>
<td>4.Workers'Compensation (Employer's Liability)</td>
<td>Statutory - Michigan $100,000</td>
</tr>
<tr>
<td>5.Property - All Risk</td>
<td>In an amount sufficient to cover the total value of the contractor's property in the care, custody or control of WSU.</td>
</tr>
</tbody>
</table>

B. Maximum Acceptable Deductibles

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Maximum Deductible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive General Liability</td>
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<td>Fire Legal Liability</td>
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<td>Comprehensive Automobile Liability</td>
<td>-0-</td>
</tr>
<tr>
<td>Workers' Compensation</td>
<td>-0-</td>
</tr>
<tr>
<td>Property - All Risk</td>
<td>$500</td>
</tr>
</tbody>
</table>

11.1.3 The Board of Governors, Wayne State University, shall be named as an additional insured but only with respect to accidents arising out of the performance of said contract. The contractor shall prepare a certificate of insurance which shall name the “Office of Risk Management; 5700 Cass Avenue” as the Wayne State University certificate holder.

11.1.3.1 The Contractor shall either 1) require each of his Subcontractors to procure and to maintain during the life of his subcontract, Subcontractors’ Comprehensive General Liability, Automobile Liability and Property Damage Liability Insurance of the type and in the same amounts as specified in the Subparagraph, or 2) insure the activity of his subcontractors in his own policy.

11.2 OWNER'S LIABILITY INSURANCE
Delete Article 11.2 in its entirety.

11.3 PROPERTY INSURANCE

Delete Article 11.3 in its entirety and replace with the following:

11.3.1 The Contractor shall purchase and maintain property insurance upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors, and sub-subcontractors in the work and shall insure against the perils of Fire, Extended Coverage, Vandalism, and Malicious Mischief.

11.3.2 The Owner and Contractor waive all rights against each other for damages caused by fires or other perils to the extent covered by insurance provided under Subparagraph 11.3.1. The Contractor shall require similar waivers by Subcontractors and sub-subcontractors in accordance with Clause 5.3.1.5.

11.3.3 Insurance must be issued by an insurance company with an “A rating as denoted in the AM Best Key Rating Guide”.

ARTICLE 12 - CHANGES IN THE WORK

12.1 CHANGE ORDERS

12.1.8 Percentage markups in pricing under Subparagraphs 12.1.3.1, 12.1.3.3, and 1.2.4 shall be as limited in the Contract Documents. Unit price of Subparagraph 12.1.3.2 shall represent total unit cost to the Owner and shall include the Contractor’s markup for overhead and profit.

ARTICLE 14 - TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the work is stopped for a period of thirty days under any order of any court or other public authority having jurisdiction, or as a result of any act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the contract or a subcontractor or their agents or employees or other persons performing any of the Work under a contract with the contractor, then the contractor may, upon seven days’ written notice to the Owner and the Architect, terminate the contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment, and machinery, including reasonable profit and damages.

ARTICLE 15 - ADDITIONAL CONDITIONS

15.1 SUBSTITUTION OF MATERIALS AND EQUIPMENT

15.1.1 Whenever a material, article, or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors, which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is, in the opinion of the Architect, of equal substance, appearance, and function. It shall not be purchased or installed by the Contractor without the Architect's written approval.

15.2 NON-DISCRIMINATION PROVISION AND WAGE AND HOUR ACT

15.2.1 During the performance of this contract, the Contractor agrees as follows:

15.2.1.1 The Contractor shall not discriminate against any employee or applicant for employment because of sex, race, creed, color, age, or national origin. The Contractor will take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to
their sex, race, age, creed, color, or national origin.

15.2.1.2 Such action shall include but not be limited to, the following: employment; upgrading; demotion; or transfer; recruitment or recruitment advertising; layoff or terminations; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this non-discrimination clause.

15.2.1.3 The Contractor will, in all solicitations, or advertisements for employees, placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to sex, race, creed, color, age or national origin.

15.2.1.4 The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or worker's representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of October 27, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

15.2.1.5 The Contractor will comply with all provisions of the Executive Order No. 11246 of October 27, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor or other government agency or authority having jurisdiction.

15.2.1.6 The Contractor will furnish all information and reports required by Executive Order No. 11246 of October 27, 1965, and by the rules, regulations, and orders of the Secretary of Labor or other government agency or authority having jurisdiction, and will permit access to his books, records, and accounts by the administrative agency and the Secretary of Labor for the purposes of investigation to ascertain compliance with such rules, regulations and orders.

15.2.1.7 In the event of the Contractor's noncompliance with the non-discrimination clauses of this contract, or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated or suspended in whole or in part, and the Contractor may be declared ineligible for further University contracts or federally-assisted contracts in accordance with procedure authorized in Executive Order No. 11246 of October 27, 1965, or by rule, regulation, or order of the Secretary of Labor or other government agency or authority having jurisdiction.

15.2.1.8 The Contractor will include in the provisions of Subparagraph 15.2.1.1 through 15.2.1.8 in every subcontract or purchase order unless exempted by rules, regulations or orders of the President's Committee on Equal Employment Opportunity issued pursuant to Section 204 of Executive Order No. 11246 of September 14, 1965, so that provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

15.3 COMPLIANCE WITH COPELAND ANTI-KICKBACK ACT AND REGULATIONS

15.3.1 The Contractor shall comply with the Copeland Anti-Kickback Act and Regulations of the Secretary of Labor (29CFR, Part 3) which are herein incorporated by reference.

15.4 PREVAILING WAGES

15.4.1 Contractors and subcontractors shall pay all mechanics and laborers, including apprentices and trainees, no less than the wage and fringe benefit rates prevailing in the locality in which the work is performed. Wage and fringe benefit rates are determined by the Federal Government Department of Labor.

15.4.2 Classifications not provided in the schedule shall be determined prior to the award of the contract and shall be no less than the wage and fringe benefit rates determined by the Federal Department of Labor.
15.4.3 Contractors and subcontractors shall adhere to the ratios of apprentices to journey workers as determined by the Federal Department of Labor.

15.4.4 Contractors and subcontractors shall keep a copy of the prescribed wage and benefit rates posted at the construction site in a conspicuous place.

15.4.5 Contractors and subcontractors shall keep an accurate record of the name, occupation, and the actual benefits paid to each mechanic or laborer for the contract. This record shall be made available for reasonable inspection by the Federal Department of Labor and the Owner.
The Technical Specifications dated **January 9, 2015** and the following List of Drawings represent the scope of work as defined in the Contract Documents from Article 4.

### DRAWINGS

<table>
<thead>
<tr>
<th>Drawing No.:</th>
<th>Description</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>L101</td>
<td>Demolition Plan</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>L102</td>
<td>Layout/Paving Plan</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>L103</td>
<td>Grading/Drainage Plan</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>L104</td>
<td>Landscape Plan</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>L501</td>
<td>Site Details</td>
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</tr>
<tr>
<td>L502</td>
<td>Site details</td>
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</tr>
<tr>
<td>A101</td>
<td>Architectural Details</td>
<td>January 9, 2015</td>
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<tr>
<td>D2</td>
<td>Sewer Details</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>E101</td>
<td>Electrical Site Plan and Details</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>I101</td>
<td>Irrigation Plan</td>
<td>January 9, 2015</td>
</tr>
<tr>
<td>I102</td>
<td>Irrigation Details</td>
<td>January 9, 2015</td>
</tr>
</tbody>
</table>

#### Technical Specifications

- 012300 Alternates
- 013323 Shop Drawings, Product Data and Samples
- 015639 Tree and Plant Protection
- 023000 Subsurface Investigation
- 024113 Site Demolition
- 260500 Common Work Results for Electrical
- 260519 Electrical Conductors
- 260526 Grounding for Electrical Systems
- 260529 Hangers and Supports for Electrical Systems
- 260533 Raceway and Boxes for Electrical Systems
- 260923 Lighting Control Devises
- 042000 Unit Masonry
- 044000 Dimension Stone
- 079200 Joint Sealants
- 129300 Site Furnishings
- 312000 Earthwork for Site
- 312500 Soil Erosion and Sedimentation Control
- 320536 Landscape Maintenance and Warranty Standards
- 321440.14 Flagstone Paving (Dry Set)
- 328400 Irrigation System
- 321216 Asphalt Concrete Paving
- 321313.13 Exposed Aggregate Concrete Paving
- 323119 Steel Ornamental Picket Fencing and Gates
- 329119 Topsoil
- 329223 Sodding
- 329300 Plants
- 334000 Storm Drain Facilities
- 334600 Underdrainage
GENERAL REQUIREMENTS

GENERAL

A. CONTRACTOR'S RESPONSIBILITY

It is not the responsibility of the Architect/Engineer or Owner's Representative to notify the Contractor or subcontractors when to commence, to cease, or to resume work; nor in any way to superintend so as to relieve the Contractor of responsibility or of any consequences of neglect or carelessness by him or his subordinates. All material and labor shall be furnished at times best suited for all Contractors and subcontractors concerned, so that the combined work of all shall be properly and fully completed on the date fixed by the Contract.

The Contractor shall be responsible for all items contained in both the specifications and on the drawings for all trades. He shall be responsible for the proper division of labor according to current labor union agreements regardless of the division of responsibility implied in the contract documents.

B. CODES AND STANDARDS

Reference to standard specifications for workmanship, apparatus, equipment and materials shall conform to the requirements of latest specifications of the organization referenced, i.e., American Society for Testing Materials (ASTM), Underwriters Laboratories, Inc. (UL), American National Standards Institute, Inc. (ANSI), and others so listed in the Technical Specifications.

C. PERMITS, FEES AND NOTICES

See Supplementary General Conditions.

D. MEASUREMENTS

Before proceeding with each Work Item, Contractor shall locate, mark and measure any quantity or each item and report quantities to Engineer. If measured quantities exceed Engineer’s estimate, Contractor shall obtain written authorization to proceed from Owner before executing Work required for that Work Item.

Measurement of quantities for individual Work Items will be performed by Contractor and reviewed by Engineer. Coordinate measurements with inspection as required in Section “Coordination.”

Cost of Work included in Work Item for quantities as indicated in Contract Documents shall be included in Base Bid.

1. Additions to or deductions from lump sum price for quantities of each Work Item added to or deducted from Work respectively shall be at unit prices indicated in Bid Form and shall constitute payment or deductions in full for all material, equipment, labor, supervision and incidentals necessary to complete Work.

E. CONTRACTOR'S MEASUREMENTS

Before ordering material, preparing Shop Drawings, or doing any work, each Contractor shall verify, at the building, all dimensions which may affect his work. He assumes full responsibility for the accuracy of his figures. No allowance for additional compensation will be considered for minor discrepancies between dimensions on the drawings and actual field dimensions.

F. CONTINUITY OF SERVICE (Revised 3-26-2012)

Continuity of all existing services in the building shall be maintained throughout the construction period. Where it is necessary to tie into the existing electrical service, water or waste systems, it shall be done as directed by the Architect/Engineer. This Contract shall also provide temporary lines or bypasses that may be required to maintain continuous service in the building. All utility shutdowns must be approved by the Owners Representative/Project Manager, not less than 7 business days prior to the event, so that proper notification can be posted.
G. SUBMITTALS

All submittals (except Shop Drawings) and samples required by the Specifications shall be submitted in triplicate unless otherwise specified for a particular item under an individual Specification Section.

Each sample shall be clearly identified on a tag attached, showing the name of the Project Consultant, the project number and title, the names of the Contractor, manufacturer (and supplier if same is not the manufacturer), the brand name or number identification, pattern, color, or finish designation and the location in the work.

Each submittal shall be covered by a transmittal letter, properly identified with the project title and number and a brief description of the item being submitted.

Contractor shall be responsible for all costs of packing, shipping and incidental expenses connected with delivery of the samples to the Project Consultant or other designated address.

If the initial sample is not approved, prepare and submit additional sets until approval is obtained.

Materials supplied or installed which do not conform to the appearance, quality, profile, texture or other determinant of the approval samples will be rejected, and shall be replaced with satisfactory materials at the Contractor's expense.

H. GENERAL/STANDARD ELECTRONIC EQUIPMENT AND INFRASTRUCTURE REQUIREMENTS (Revised 11-2008)

1. Compliance with WSU Standards for Communications Infrastructure

   A. All applicable work, products, materials and methods shall comply with the latest version of the “WSU Standards for Communications Infrastructure” except as where noted.

   B. This document is available at the following website/URL: http://networks.wayne.edu/WSU-Communications-standards.pdf

2. Automation System Program Code

   A. All automation system uncompiled and compiled program codes, source codes, custom modules, graphical user interface screen shots and any other automation system programming data and material (Program Code) shall be provided to the UNIVERSITY in hard copy and on CD Rom in an unencrypted format acceptable to the UNIVERSITY.

   B. Copyright for the Program Code shall be assigned to the UNIVERSITY for purposes of system maintenance.

PROTECTION OF OCCUPANCY (Revised 3-2006)

A. FIRE PRECAUTIONS

Take necessary actions to eliminate possible fire hazards and to prevent damage to construction work, building materials, equipment, temporary field offices, storage sheds, and other property.

During the construction, provide the type and quantity of fire extinguishers and fire hose to meet safety and fire prevention practices by National Fire Protection Association (NFPA) Codes and Standards (available at http://www.nfpa.org/ )

In the event that construction includes "hot work", the contractor shall provide the Owner's Representative with a copy of their hot work policy, procedures, or permit program. No hot work activity (temporary maintenance, renovation, or construction by operation of a gas or electrically powered equipment which produces flames, sparks or heat that is sufficient to start a fire or ignite combustible materials) shall be performed until such documents are provided. During such operations, all highly combustible or flammable materials shall be removed from the immediate working area, and if removal is impossible, same shall be protected with flame retardant shield.
Not more than one-half day’s supply of flammable liquids such as gasoline, spray paint and paint solvent shall be
brought into the building at any one time. Flammable liquids having a flash point of 100 degrees F. or below which
must be brought into the building shall be confined in an Underwriters Laboratories (UL) labeled safety cans. The
bulk supply of flammables shall be stored at least 75 feet from the building and other combustible materials.
Spigots on drums containing flammable liquids are prohibited on the project site. Drums shall be equipped with
approved vented pumps, and be grounded and bonded.

Only a reasonable working supply of combustible building materials shall be located inside the building.

All oil-soaked rags, papers, and other similar combustible materials shall be removed from the building at the close
of each day’s work, or more often if necessary, and placed in metal containers, with self-closing lids.

Materials and equipment stored in cardboard cartons, wood crates or other combustible containers shall be stored
in an orderly manner and accessibly located, fire-fighting equipment of approved types shall be placed in the
immediate vicinity of any materials or equipment stored in this type of crate or carton.

No gasoline, benzene, or like flammable materials shall be poured into sewers, manholes, or traps.

All rubbish shall be removed from the site and legally disposed of. Burning of rubbish, waste materials or trash on
the site shall not be permitted.

The contractor shall be responsible for the conduct of employees relative to smoking and all smoking shall be in
the area designated by the Architect/Engineer.

B. GENERAL SAFETY AND BUILDING PRECAUTIONS

Provide and maintain in good repair barricades, railings, etc., as required by law for the protection of the Public. All
exposed material shall be smoothly dressed.

At dangerous points throughout the work environment provide and maintain colored lights or flags in addition to
above guardrails.

Isolate Owner’s occupied areas from areas where demolition and alteration work will be done, with temporary,
dustproof, weatherproof, and fireproof enclosures as conditions may require and as directed by the
Architect/Engineer.

Cover and protect furniture, equipment and fixtures to remain from soiling, dust, dirt, or damage when demolition
work is performed in rooms or areas from which such items have not been removed.

Protect openings made in the existing roofs, floors, and other construction with weatherproof coverings, barricades,
and temporary fire rated partitions to prevent accidents.

Repair any damage done to existing work caused by the construction and removal of temporary partitions,
coverings, and barricades.

The Contractor will be held responsible for all breakage or other damage to glass up to the time the work is
completed.

Provide protection for existing buildings, interior and exterior, finishes, walls, drives, landscaping, lawns (see
below), etc. All damages shall be restored to match existing conditions to the satisfaction of the Architect/Engineer.

The Contractor and Owner will define the anticipated area of lawn damage at the project Pre-Construction Meeting.
Whether the lawn is sparse or fully developed, any lawn damaged due to the Contractor's work will be replaced
with sod by the University. The University's unit cost of $10.00 per square yard and landscaping at a rate of 1.5
times the cost of the sod repairs, the full cost of which will be assessed against the Contractor. At the completion
of the project, a deductive Change Order reflecting this cost will be issued.

The Contractor is to include an allowance in his bid for this corrective work.
C. **INTERFERENCE WITH OWNER'S OPERATIONS**

The Owner will be utilizing the Building Facilities to carry on his normal business operation during construction. The Contractor shall schedule performance of the work necessary to complete the project in such a way as to interfere as little as possible with the operation during construction. The Contractor shall schedule performance of the work necessary to complete the project in such a way as to interfere as little as possible with the operation of the Owner.

Work which will interfere with the Owner's occupancy, including interruptions to the Owner's mechanical and electrical services, and essentially noisy operations (such as jackhammering) shall be scheduled in advance. The schedule of alterations shall be approved by the Architect/Engineer and the work shall be done in accordance with the approved schedule.

It is understood that the work is to be carried through to completion with the utmost speed consistent with good workmanship and to meet the construction schedule.

The Contractor shall begin work under the Contract without delay upon receipt of the fully-executed contract and shall substantially complete the project ready for unobstructed occupancy and use of the Owner for the purposes intended within the completion time stated in the contract.

The Contractor shall, immediately upon award of contract, schedule his work and expedite deliveries of materials and performance of subcontractors to maintain the necessary pace to meet the construction schedule.

**CONTRACTOR'S REPRESENTATION AND COORDINATION**

A. **FIELD SUPERINTENDENT**

Contractor shall assign a full time project manager/superintendent for the duration of the project. This person shall be experienced and qualified in all phases of the work and shall be present at the site during Contractor's working hours. The project manager shall have Contractor's full authority to represent Contractor in all routine operations including payment, changes to the work, and scheduling. Contractor shall not re-assign this individual without prior written permission of the Owner.

B. **MEETINGS**

When directed by the Architect/Engineer, meetings shall be held for the purpose of coordinating and expediting the work. The invited contractors or subcontractors will be required to have qualified representatives at these meetings, empowered to act in their behalf.

C. **COORDINATION**

The Contractor shall also provide a staff adequate to coordinate and expedite the work properly and shall at all times maintain competent supervision of its own work and that of its subcontractors to insure compliance with contract requirements.

The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the work under the Contractor.

D. **CONSTRUCTION SCHEDULE**

The Construction Schedule shall be prepared after the award of contract. Soon after, a pre-construction meeting is held with the Owner and the Architect/Engineer to determine the areas to which the Contractor will be allowed access at any one time.

The Contractor is alerted to the fact that areas in which he will be working will be occupied by students and employees of the University as well as the general public. The Contractor's access, to and from the project site, will be confined to limited areas so as not to unduly disrupt the normal activities of the University.
A. GENERAL

The following temporary facilities descriptions represent standard conditions. Verify accuracy with Architect/Engineer at time of bids.

B. CONTRACTOR'S OFFICE

Provide field offices as required. Locate temporary field offices on site where directed by Architect/Engineer.

Appearance and location of field offices shall be approved by the Architect/Engineer.

Provide for all other administrative facilities and storage off the Owner's property.

C. STORAGE OF MATERIALS

All materials shall be stored in areas designated by the Architect/Engineer. All stored materials shall be arranged for the minimum disruption to occupants and to allow full access to and throughout the building. Materials stored outdoors shall be neat and orderly and covered to prevent damage or vandalism.

D. PARKING

1. GENERAL

University parking regulations will be strictly enforced.

Maintain Owner's parking areas free of dirt and debris resulting from operations under the contract.

2. STANDING AND UNLOADING/LOADING VEHICLES

All Contractors are to call Wayne State University Public Safety at 577-2222, and give at least 24 hours advance notice that they have vehicles that must be at the job site.

Vehicles will be permitted at the project site only as long as the vehicles are needed for loading/unloading, and must be immediately moved upon completion.

All unauthorized and/or unattended standing vehicles will be subject to ticketing and removal by University Police. Towed vehicles may be reclaimed by calling 577-2222, and paying any assessed charges.

3. COMPLIMENTARY PARKING

There is no complimentary parking for Contractor's employee vehicles.

4. WAYNE STATE UNIVERSITY PUBLIC/STUDENT PARKING AREAS

Public Parking, on a first-come first-served basis is available. Contact the office of the One Card System, at 313.577.9513 for information on availability of parking on a contractual basis.

E. TOILET FACILITIES

The Owner's designated existing toilet facilities may be used by workers on the project. Contractor shall maintain such facilities in a neat and sanitary condition.

F. TELEPHONE USE

If required, the Contractor shall provide and pay for a temporary telephone within the building for his use and that of his subcontractors.

No use of the Owner's telephone (except pay telephones) will be permitted.
G. **ACCESS DEVICES**

The Contractor shall furnish and maintain temporary hoists, ladders, railings, scaffolds, runways, and the like as required for safe, normal access to the permanent construction until the permanent facilities are complete. Each trade shall furnish such additional means of access as may be required for the progress and completion of the work. Such temporary access devices shall meet all applicable local, state, and federal codes and regulations.

H. **HEAT AND VENTILATION**

Provide cold weather protection and temporary heat and ventilation as required during construction to protect the work from freezing and frost damage.

Provide adequate ventilation as required to maintain reasonable interior building air conditions and temperatures, to prevent accumulation of excess moisture, and to remove construction fumes.

Tarpaulins and other materials used for temporary enclosures. Coverings and protection shall be flameproofed.

I. **WATER SERVICE**

Sources of water are available at the site. The Owner will pay for reasonable amounts of water used for construction purposes.

The Contractor shall provide, at the earliest possible date, temporary connections to the water supply sources and maintain adequate distribution for all construction requirements. The Contractor shall protect sources against damage.

Methods of conveying this water shall be approved by the Architect/Engineer and shall not interfere with the Owner's operations.

J. **ELECTRICAL SERVICES**

All charges for reasonable amounts of electrical power energy used for temporary lighting and power required for this work will be paid by the Owner.

The Contractor shall provide and maintain any temporary electrical lighting and power required for this work. At the completion of the work, all such temporary electrical facilities shall be removed and disposed of by the Contractor.

Temporary lighting and power shall comply with the regulations and requirements of the National Electrical Code

**INSPECTIONS AND TESTS**

The Architect/Engineer shall at all times have access to the work wherever it is in preparation or in progress and the Contractor shall provide proper facilities for such access and for observation.

No failure of the Architect/Engineer, during the progress of the work, to discover or reject materials or work not in accordance with the Contract Specifications and Drawings shall be deemed an acceptance thereof nor a waiver of defects therein. Likewise, no acceptance or waiver shall be inferred or implied due to payments made to contractor or by partial or entire occupancy of the work, or installation of materials that are not strictly in accordance with the Contract Specifications and Drawings.

Where tests are specifically called for in the Specifications, the Owner shall pay all costs of such tests and engineering services unless otherwise stated in the contract.

Where tests are not specifically called for in the Specifications, but are required by the Architect/Engineer or Consultant, the Owner shall pay all costs of such tests and engineering services unless the tests reveal that the workmanship or materials used by the Contractor are not in conformity with the Drawings, Specifications, and/or approved shop drawings. In such event, the Contractor shall pay for the tests, shall remove all work and materials so failing to conform and replace with work and materials that are in full conformity.

**CLEAN-UP**
The Contractor shall at all times keep the Owner's premises and the adjoining premises, driveways and streets clean of rubbish caused by the Contractor's operations and at the completion of the work shall remove all the rubbish, all of his tools, equipment, temporary work and surplus materials, from and about the premises, and shall leave the work clean and ready for use. If the contractor does not attend to such cleaning immediately upon request, the Architect/Engineer may cause such cleaning to be done by others and charge the cost of same to the Contractor.

The Contractor will be responsible for all damage from fire that originates in, or is propagated by, accumulations of rubbish or debris.

All rubbish and debris shall be disposed of off the Owner's property in an approved sanitary landfill site. No open burning of debris or rubbish will be permitted. Job site shall be left neat and clean at the completion of each day's operation.

PROJECT CLOSE-OUT

A. RECORD DRAWINGS

At beginning of job, provide one copy of Working Drawings, and record changes, between Working Drawings and "As Builts", including changes made by Addenda, Change Orders, Shop Drawings, etc. These shall be kept up to date. Update to indicate make of all mechanical and electrical equipment and fixtures installed. Keep these Record Prints in good condition and available for inspection by the Architect/Engineer.

Upon completion of the job, turn over to the Architect/Engineer Record Prints of Working Drawings showing all job changes.

B. OPERATING AND MAINTENANCE DATA

Prepare and furnish to the Architect/Engineer three (3) bound copies of "Operating and Maintenance Manual" on all equipment installed under this Contract.

Manual shall include copies of all Manufacturers’ "Operating and Service Instructions", including Parts List, Control Diagrams, Description of Control Systems, Operating, Electrical Wiring, and any other information needed to understand, operate and maintain the equipment. The names and addresses of all subcontractors shall be included. These instructions shall be custom-prepared for this job -- catalog cuts will not be accepted. Equipment shall be cross-referenced to Section of Specifications and to location shown and scheduled on drawings.


C. FINAL INSPECTION

Secure final inspections from the State of Michigan as soon as the work is completed and immediately submit such Certificates to the Architect/Engineer.

D. GUARANTEES (See Sections 00510 and 01781)

Guarantees on material and labor from the General Contractor and his subcontractors shall be as required in Sections 00510 and 01781.

E. SWORN STATEMENT AND WAIVER OF LIENS (revised 4-11-2012)

Prior to final payment, the General Contractor shall provide a Contractor's Sworn Statement and Full Unconditional Waivers of Liens from all subcontractors for material and labor and from all suppliers who provide materials exceeding $1,000. Sworn Statements and signed waivers from all Subcontractors must accompany Pay Applications or they will be returned for such documentation prior to approval.

ASBESTOS HAZARD
A. The contractor shall not start any work in any area that has not been inspected for asbestos by the Owner's Industrial Hygiene Department, or a qualified representative of the Owner and approval is given for work to be done. If asbestos is found, safety measures as recommended by the Owner's Industrial Hygiene Department, or a qualified representative of the Owner, shall be completed, or approval given for work to be done before work is started. The contractor shall not perform any asbestos removal or containment work under the contract.

KEYS

A. The Owner shall provide the contractor keys on loan to have access to the various spaces in order to complete the contract. Contractor will sign for and be responsible for each key on loan, returnable to Owner upon completion of the contract. In case of any lost keys, the Owner will backcharge the contract $250.00 for each core change. In the event that a Contractor wants access to a secured area, he shall give the Owner a minimum 48-hour notice.
SUMMARY OF WORK

PROJECT: Freer Ground Water Infiltration 2014
WSU PROJECT NO.: 511-228377
PROJECT MANAGER: Nancy Milstein

1. EXAMINATION

   The Contractor shall visit the site and become familiar with conditions under which he will be working. Also meet with
   the project manager and review site access, storage areas, etc.

2. Description of Work – Project includes Construction and landscaping services to install a foundation damp-
   proofing system at Wayne State University Historic Freer House. Establish new topographical grades, enhance
   existing site drainage, expand site irrigation and provide new hardscape, site lighting, landscaping and site
   amenities.
   Site Work:
   a. Remove and dispose of all concrete paving and base as designated on drawings.
   b. Remove and dispose of all plant materials as designated and excavate beds per details.
   c. Remove and stockpile all stone paving. Excavate and dispose of base material.
   d. Remove and dispose of all storm drainage, including cutting and capping of lines, as designated on demolition plan
   e. Remove and dispose of all chainlink fencing as designated.
   f. Remove concrete steps at entry into Carriage House (Peacock Room).
   g. Remove and stockpile all bluestone pieces located between Carriage House and west property line.
   h. Provide and install new exposed aggregate concrete paving and base.
   i. Provide and install reclaimed sandstone paving and base.
   j. Provide and install masonry piers and foundations per details.
   k. Provide and install decorative metal fencing and foundation per details.
   l. Provide and install new storm and underdrainage system, including all associated man holes on site and off site per
      drawings.
   m. Provide and install all site furnishings as designated on drawings.
   n. Provide and install asphalt paving and base in rear parking lot associated with new manhole construction.
   o. Provide and install foundation for stone lantern.
   p. Provide and install imported plant mix to all new plant beds.
   q. Provide and install imported screened topsoil as required to complete lawn repair. Provide and install new irrigation
      system as required per new plantings, (including all plumbing connections). Design build system.
   r. Provide and install all landscape plant materials, sodded lawn, and accessories as indicated on the drawings.
s. One year maintenance with guarantee period.
3. The building is located at
   Wayne State University
   71 East Ferry
   Detroit, Michigan 48202
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Drawings Cover, Survey (3) dated December 19, 2014

- L101 Demolition Plan
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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. This Section identifies each Alternate by number, and describes the basic changes to be incorporated into the Work, only when that Alternate is made a part of the Work by specific provisions in the Owner-Contractor Agreement.

B. Alternates schedules below are part of the Bidding Documents and will be considered in selection of Contractors and awarding contracts.

C. Unless otherwise provided, Owner will accept or reject alternate within sixty (60) days. Owner reserves the right to reject any or all Alternates.

1.3 ALTERNATES:

A. General:

1. The descriptions for each Alternate listed in the schedule are primarily scope definitions, and do not necessarily detail the full range of materials and processes needed to complete the work as required.

2. Refer to applicable specification sections (Divisions 2 through 16), and to applicable drawings, for specific requirements of the work, regardless of whether references are so noted in description of each alternate.

3. Coordinate pertinent related work and notify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by Contract Documents.

4. Referenced sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

B. Schedule:

1. No. 1 Areaway Fence / Gate:
   a. Quote change in price to add demolition of existing gate and fence at areaway. Add fabrication and installation of new fence and gate per plan and details. Refer to detail # 9, sheet A101.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 012300
SECTION 013323 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:
   A. Submit Shop Drawings, Product Data and Samples required by the Contract Documents.

1.2 RELATED REQUIREMENTS:
   A. All applicable sections of the specification.
   B. Conditions of the Contract.
   C. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Product Data and Samples will be needed.

1.3 SHOP DRAWINGS:
   A. Drawings shall be presented in a clear and thorough manner.
      1. Details shall be identified by reference to sheet, detail, and schedule numbers shown on Contract Drawings.

1.4 PRODUCT DATA:
   A. Preparation:
      1. Clearly mark each copy to identify pertinent products of models.
      2. Show performance characteristics and capacities.
      3. Show dimensions and clearances required.
      4. Show piping diagrams and controls where required.
   B. Manufacturer's Standard Schematic Drawings and Diagrams:
      1. Modify drawings and diagrams to delete information which is not applicable to the work.
      2. Supplement standard information to provide information specifically applicable to the work.

1.5 SAMPLES:
   A. Office Samples shall be of Sufficient Size and Quantity to Clearly Illustrate:
      1. Functional characteristics of the product, with integrally related parts and attachment devices.
      2. Full range of color, texture and pattern.

1.6 CONTRACTOR RESPONSIBILITIES:
   A. Review shop drawings, product data and samples prior to submission.
   B. Determine and Verify:
1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with specifications

C. Coordinate each submittal with requirements of the work and of the Contract Documents.

D. Notify the Owner's Representative in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.

E. Begin no fabrication or work which requires submittals until return of submittals with Owner's Representative or Architect's approval.

1.7 SUBMISSION REQUIREMENTS:

A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the work or in the work of any other Contractor.

B. Number of Submittals Required:
1. Shop Drawings: Submit the number of drawings that the Contractor requires, plus two (2) additional drawings that will be retained by the Owner's Representative.
2. Product Data: Submit the number of copies that the Contractor requires, plus two (2) copies that will be retained by the Owner's Representative.
3. Samples: Submit the number stated in each specification section.

C. Submittals Shall Contain:
1. The date of submission and the dates of any previous submissions.
2. The Project title and Parcel number.
4. The Names of:
   a. Contractor
   b. Supplier
   c. Manufacturer

5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
10. Identification of revisions on resubmittals.
11. An 8" x 3" blank space for Contractor and Owner's Representative / Architect's stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the work and of Contract Documents.

1.8 RESUBMISSION REQUIREMENTS:

A. Make any corrections or changes in the submittals required by Owner's Representative and resubmit until approved.
B. Shop Drawings and Product Data:
   1. Revise initial drawings or data and resubmit as specified for the initial submittal.
   2. Indicate any changes which have been made other than those requested by the Owner's Representative.

C. Samples: Submit new samples as required for initial submittal.

1.9 DISTRIBUTION:
   A. Distribute reproduction of Shop Drawings and copies of Product Data which carry the Owner's Representative's or Architect's stamp of approval to:
      1. Job site file
      2. Record Documents file
      3. Other affected Contractors
      4. Subcontractors
      5. Supplier or Fabricator
   B. Distribute samples which carry the Owner's Representative's or Architect's stamp of approval as directed by the Owner's Representative or Architect.

1.10 OWNER'S REPRESENTATIVE OR ARCHITECT DUTIES:
   A. Review submittals with reasonable promptness and in accord with schedule.
   B. Affix stamp and initials or signature and indicate requirements for resubmittal, or approval of submittal.
   C. Return submittals to Contractor for distribution, or for resubmission.

PART 2 - PRODUCTS – Not Applicable

PART 3 - EXECUTION – Not Applicable

END OF SECTION 013323
SECTION 015639 - TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of tree and plant protection is shown on drawings and by provisions of this Section.

B. Related Work Specified Elsewhere:
   1. Section 024113: Site Demolition
   2. Section 312500: Soil Erosion and Sedimentation Control

1.3 DEFINITIONS:

A. Protective Barrier: A temporary device installed during the full period of construction to protect existing vegetation from damage or disturbance.

B. Damage: Physical change to the site or its vegetation caused by equipment, materials, labor or grading operations which has occurred after onsite work operations have commenced.

C. Drip-Line: The outer perimeter of the plant canopy projected on the ground plane.

D. Existing Vegetation: Any existing tree, shrub or ground cover presently on site and which will remain.

E. Protection: Means of protecting existing site vegetation from trespass, damage or disturbance by use of barriers or other means necessary to prevent trespass, damage or disturbance.

1.4 SUBMITTALS:

A. Certification: Submit written certification by qualified Arborist that trees and plants indicated to remain have been protected during course of construction in accordance with recognized standards and that where damage did occur, trees and plants were promptly and properly treated. Indicate which damaged trees and plants (if any) are incapable of retaining full growth potential and are recommended to be replaced.

1.5 QUALITY ASSURANCE:

A. Arborist Qualifications: Engage a certified Arborist who has successfully completed tree protection and trimming to perform the following work:
   1. Remove branches from trees that are to remain if required.
   2. Recommend procedures to compensate for loss of roots and perform initial pruning of branches and stimulation of root growth where removed to accommodate new construction.
3. Recommend procedures for excavation and grading work where adjacent to established plants.
4. Perform tree repair work for damage incurred by new construction.

1.6 PROJECT CONDITIONS:

A. Temporary Protection: Provide temporary fencing, barricades or other suitable guards located outside to protect trees and other plants that are to remain from damage.

B. Root Systems: Do not store construction materials, debris, or excavated material within drip line of trees to remain. Do not permit vehicles within drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems within drip line.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Barriers: Plastic safety fence 4’-0” high.
   1. Support barriers with 6’-0” steel fence posts spaced not more than 8’-0” o.c.

B. Topsoil: See Section 329119 - Topsoil.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION:

A. Do not commence clearing operations prior to installing protective barriers.

B. Protect tree root systems from damage due to noxious materials caused by run-off or spillage during mixing, placement or storage of construction materials. Protect root systems from flooding, eroding or excessive wetting resulting from watering operations.

C. Do not allow fires under or adjacent to trees or other plants that are to remain.

D. Coordinate with Owner removal of branches from trees that are to remain if required to clear new construction.

3.2 EXCAVATION AROUND TREES:

A. Excavate within proximity of trees only where indicated. Do not machine excavate within drip-line.

B. Where excavating for new construction is required within drip-line of trees, hand excavate to minimize damage to root systems. Provide sheeting at excavations if required. Use narrow-tine spading forks and comb soil to expose roots.
   1. Relocate roots in backfill areas wherever possible. If large, main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.
C. Do not allow exposed roots to dry out before permanent backfill is placed; provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in moist condition and temporarily support and protect from damage until permanently relocated and covered with earth.

D. Where trenching for utilities is required within drip-line, tunnel under or around roots by hand digging. Do not cut main lateral roots or tap roots; cut only small roots that interfere with installation of new work. Cut roots with sharp pruning instruments; do not break or chop.

E. Prune branches to balance loss to root system caused by damage or cutting of root system.

3.3 GRADING AND FILLING AROUND TREES:

A. Maintain existing grade within canopy drip line of trees unless otherwise indicated.

B. Lowering Grades: Where existing grade is above new finish grade shown around trees, gradually slope grade away from trees as recommended by Arborist. Do not reduce grade more than 6 inches beneath canopy of tree.

   1. Prune branches to stimulate root growth and to compensate for loss of roots. Provide subsequent maintenance during the contract period as recommended by Arborist. Provide Owner with typed instructions as recommended by Arborist. Provide Owner with typed instructions for recommended long-range maintenance procedures to be followed after completion of construction operations.

C. Raising Grades:

   1. Minor Fills: Where existing grade is 6 inches or less below elevation of finish grade shown, use topsoil fill material specified. Place in single layer and do not compact; hand grade to required finish elevations.

   2. Moderate Fills: Where existing grade is more than 6 inches below finish grade elevation, place a layer of drainage fill on existing grade before placing topsoil. Carefully place against trunk of tree approximately 2 inches above finish grade elevation and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill to an elevation 6 inches below grade and completely fill with a layer of topsoil to finish grade elevation. Do not compact drainage fill or topsoil layers; hand grade to required elevations.

3.4 REPAIR AND REPLACEMENT OF TREES:

A. Repair trees if damaged by construction operations. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

B. Remove and replace dead and damaged trees that Arborist determines to be incapable of restoration to normal growth pattern.

   1. Provide new trees of same size and species as those being replaced. Plant and maintain as acceptable to Architect and provisions stated in Section 320536 – Landscape Maintenance and Warranty Standards.

C. Maintain trees including fertilizing and watering.
3.5 DISPOSAL:

A. Burning removed trees and branches is not permitted on site.

B. Remove excess excavation, displaced trees and trimmings and dispose of off Owner's property.

END OF SECTION 015639
SECTION 023000 - SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplementary Requirements, which are hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment and services to complete the subsurface investigation, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. The subsurface investigation for conditions of the project site is the sole responsibility of the Contractor. In preparing the proposal, the Contractor shall make all subsurface or surface investigations necessary to provide proper background and knowledge to determine the nature and extent of work required.

C. All known surface and subsurface data shown on the documents is based on survey drawings provided by Nowak & Fraus Engineers, 46777 Woodward Ave., Pontiac, MI  48342, Ph#: (248) 332-7931. Owner or Owner’s Representative makes no warranties or guarantees, as to the accuracy or completeness of the drawings nor concerning the nature of materials to be encountered on the site.

D. Owner or Owner’s Representative provides no subsurface information, and makes no warranties or guarantees concerning the nature of materials to be encountered on or under the site.

E. Related Work Specified Elsewhere:

1. Section 024113: Demolition
2. Section 312500: Soil Erosion and Sedimentation control
3. Section 334000: Storm Drainage Facilities
4. Section 312000: Earthwork for Site

PART 2 - PRODUCTS – Not Applicable

PART 3 - EXECUTION – Not Applicable

END OF SECTION 023000
SECTION 024113 - SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to Supplemental General Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment and services to complete the site demolition, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 312000: Earthwork for Site
3. Section 312500: Soil Erosion and Sedimentation Control

1.3 SUBMITTALS:

A. Permit of transport and disposal of debris if required.

B. Demolition procedures and operational sequences for review and acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Contractor Qualifications: Minimum of five (5) years experience in demolition of comparable nature.

B. Requirements of All Applicable Regulatory Agencies:

1. All applicable Building Codes and other public Agencies having jurisdiction upon the work.

1.5 JOB CONDITIONS:

A. General:

1. It shall be the contractor’s responsibility to verify all existing survey information including utility systems before any demolition or construction work occurs. Any discrepancies with the survey information shall be reported to the landscape architect and owner’s representative immediately.

2. Erect barriers, fences, guard rails, enclosures and shoring to protect personnel, structures and utilities remaining intact.

3. Existing trees to be removed within the limits of work shall be clearly identified with brightly colored ribbon.

4. Contractor shall contact and coordinate with all applicable utility companies 72 hours in advance of any work.
5. Contractor shall be responsible for making himself familiar with all underground utilities, pipes and structures. Contractor shall take sole responsibility for cost incurred due to damage and replacement of said utilities.

6. All existing conditions designated to remain within the new construction area shall be properly and adequately protected from damage during demolition operations and throughout construction. It shall be the responsibility of the contractor to restore to the original condition any of these existing items that are damaged or disturbed in any way.

7. Contractor shall limit all work and disturbance to within designated project areas. It shall be the responsibility of the contractor to restore to the original condition any damage or disturbance outside these limits.

8. Streets, sidewalks and adjacent property shall be protected throughout the work as required by local codes and regulations and approved by the owner.

9. All material specified to be removed shall be disposed of off-site per local codes and regulations.

10. Materials to be reused or salvaged shall be stored in an area designated by the owner's representative for that purpose. All salvaged materials shall remain the property of the owner.

B. Maintain Traffic:

1. Ensure minimum interference with roads, streets, driveways, sidewalks and adjacent facilities.

2. Do not close or obstruct streets and sidewalks unless approved by the Owner.

3. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways.

C. Dust Control:

1. Use all means necessary for preventing dust from demolition operations from being a nuisance to adjacent property owners. Methods used for dust control are subject to approval by the Architect prior to use and must comply with local ordinances and municipal requirements.

D. Burning:

1. On-site burning will not be permitted.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify that all items to be demolished are discontinued in use and ready for removal.

B. Do not commence work until all conditions and requirements of all applicable public agencies are complied with.

3.2 PREPARATION:

A. Notification: Notify the Owner at least three (3) full working days prior to commencing the work of this Section.
3.3 CLARIFICATION:
   A. The drawings do not purport to show all objects existing on the site.
   B. Before commencing the work of the section, verify with the Owner all objects to be removed and all objects to be preserved.

3.4 EXECUTION:
   A. Stockpiled topsoil shall be stored on site and remain protected for redistribution under this contract.
   B. All disturbed lawn areas shall be restored with 4" topsoil unless otherwise specified. Blend grades uniformly to meet.
   C. Protect existing trees to remain with a 4'-0" height snow fence located at the drip line (as designated).
   D. Grubbing shall include all weeds, shrubs, stumps and root systems of removed plant material, irrigation piping and any other irrigation materials within the limits of demolition. Grubbing shall be to the depths below proposed improvements indicated below:
      1. Concrete Paving and Walkways – Total depth of paving and sub-base.
      2. Lawn and other Planting Areas – Remove depth required for removal of stumps and roots over 2" in diameter.
   E. Concrete pavement removals shall take place at the nearest joint to illustrated removal areas.
   F. Full depth sawcuts shall be typical for all pavement removals.
   G. Refer to layout plan for new pavement locations and dimensions, relative to existing pavement and turf removals.

3.5 SCHEDULING:
   A. Schedule all work in a careful manner with all necessary consideration for the public and the Owner.
   B. Avoid interference with the use of, and passage to and from adjacent facilities.

3.6 PROTECTION OF UTILITIES:
   A. Preserve in operating condition all active utilities adjacent to or traversing the site and/or designated to remain.

3.7 OTHER DEMOLITION (IF APPLICABLE):
   A. Removal of Debris: Remove all debris from the site and leave the site in a neat, orderly condition to the full acceptance of the Owner. No debris shall be left on the site overnight.

END OF SECTION 024113
SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions and Requirements of the contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to the work of this section.

B. All work performed under any section of the electrical specifications is subject to all requirements contained under other electrical specification sections.

C. Refer to drawings and specifications prepared by the Landscape Architect. Include all equipment, wiring, materials, labor and services indicated to be the responsibility of the electrical contractor. Work and responsibilities indicated on drawings and specifications prepared by Berbiglia Associates Inc. shall not restrict, negate, limit or supersede compliance with the work or requirements indicated in other project specification sections.

1.2 SCOPE OF WORK

A. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on Drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for the completion of electrical systems.

B. These Specifications and the accompanying Drawings contemplate the furnishing and installation of all materials, equipment, supplies, labor and supervision required for the complete performance of all operations relating to the Electrical Trades work.

C. The work shall be done in accordance with best practice so as to contribute to efficiency of operation and minimum maintenance and shall be installed with proper accessibility. The materials and equipment, including all necessary accessories, shall be put into proper adjustment so that the component parts function together as a workable system. The Electrical Contractor shall provide all equipment, materials and operations as indicated either on the Drawings or contained herein or as may be reasonably implied by either to accomplish a complete electrical system.

D. All work shall be performed in a first class and workmanlike manner, in accordance with the latest accepted standards and practices for the Trades involved. None but experienced persons in the work to be performed shall be allowed to do the work. This applies particularly to items such as cable splicing, control work, systems connections, etc.

E. Work shall include but shall not be limited to the following, refer to plans and all specifications sections for complete project requirements:

1. Provide temporary electrical facilities to facilitate construction.

2. Provide all conduit, boxes, raceways, etc. required for project landscape lighting.

3. Provide all branch circuit wiring required for the project.

4. Provide separate neutral conductors for all branch wiring.
5. Provide a ground conductor for all conduits serving power wiring 120 volts.

6. Install a new circuit breaker in the existing panel.

7. Provide landscape lighting fixtures including concrete base.

8. Provide time clock, photo cell and hand-off-auto selector switch.

9. Label all junction boxes serving power 120 volts with the panel and circuit of the wiring installed in the junction box.

10. Provide complete shop drawings for all materials, systems and equipment.

11. Provide all installation instructions, operating manuals, spare parts lists, etc. for all materials, systems and equipment.

12. Provide record as built drawings of all work installed under this contract.

13. Provide complete testing of all installed equipment, materials and wiring.

1.3 DEFINITIONS

A. In the Electrical Sections of the Specifications, and on drawings, the terms "Electrical Trades", "The Contractor", or "This Contractor" shall mean the Electrical Subcontractor.

B. "Provide" shall mean "furnish and install" or "furnish all labor and materials required for the installation of".

1.4 CODES, PERMITS, AND FEES

A. All required permits, licenses, inspections and approvals shall be secured and all fees for same paid by this Contractor.

B. References to standards, codes, specifications, recommendations, etc., shall mean the latest edition of such publications adopted and published at date of invitation to submit Bid Proposals.

1. Applicable Standards and Codes:

a. In addition to requirements shown or specified, comply with the applicable standards, specifications, and codes listed below. Where requirements of the Contract Documents are in excess of these standards or code requirements, the Contract Documents shall govern.

b. Listing of associations, codes, standards and abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBM</td>
<td>Certified Ballasts Manufacturers Association</td>
</tr>
<tr>
<td>NEC</td>
<td>National Electrical Code</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing Materials</td>
</tr>
<tr>
<td>IPCEA</td>
<td>Insulated Power Cable Engineers Association</td>
</tr>
</tbody>
</table>
C. All work shall be in accordance with the State of Michigan, Department of consumer and Industry Services, Bureau of Construction Codes, Part 8, Electrical Code.

D. All work shall be in accordance with WSU guidelines and requirements.

E. For all codes, the edition of the code, or year code, shall be that enforced by the authority having jurisdiction at the time of permit application. The contractor shall verify with the authority having jurisdiction the edition of the code in effect.

1.5 MANUFACTURER'S INSTRUCTIONS

A. All operating instructions, service instructions, parts lists, etc., which are shipped with electrical equipment are to be retained and on completion of the work and turned over to the Architect/Engineer for the Owner's use. If this information is not shipped, this Contractor shall obtain said information from the manufacturer at this Contractor's cost.

1.6 GRADE OF MATERIALS AND/OR EQUIPMENT

A. Do not purchase any used or second-hand material of any kind for use on this project.

B. All items purchased for this Contract shall be new, unused material and shall be manufacturer's first or specification grade and meet the approval of the Architect/Engineer. No commonly called "competitive" grade wiring devices shall be purchased or installed.

C. In all instances where materials or methods indicate higher quality than the minimum required by codes, the Plans and Specifications shall govern.

D. All equipment of the same or similar systems shall be of the same manufacturer. Receive, handle and move to required locations all materials and equipment for the electrical work.

E. All materials and equipment shall be listed by Underwriter Laboratories, Inc., and shall show their label wherever standards have been established.

1.7 ASSEMBLY OF EQUIPMENT

A. The Contract Drawings and Specifications make mention of numerous items to be purchased and installed and are noted by a manufacturer's name, catalog number, series and/or brief description.

B. The catalog number as mentioned may not be complete to designate all the accessory parts and appurtenances required for the particular use or function.

C. It shall be the responsibility of the Electrical Contractor to provide the equipment complete with all accessories as required for a complete and operable system including all special finishes as indicated.
1.8 USE OF EQUIPMENT

A. The use of any equipment or any part thereof for purposes other than testing, even with the Owner's consent, shall not be construed to be an acceptance of the work on the part of the Owner, or to be construed to obligate the Owner in any way to accept improper work or defective materials.

B. Owner's lamps shall not be used for temporary lighting except as allowed and directed by Owner. All lighting fixtures shall be equipped with new lamps when project is turned over to the Owner.

1.9 AS-BUILT DRAWINGS

A. After completion of the work, provide a complete set of "As-Built" drawings to the Architect. Show the exact locations of all buried services both inside and outside of the building, with dimensions given from fixed reference points. "As-Built" drawings shall be kept up to date as the job progresses and shall be kept at the job site for inspection at any time by the Architect's Field Representative.

1.10 PARTS RECEIPT

A. Retain all portable and detachable portions of the installations such as keys, tools, manuals, etc., until the completion of the work and turn them over to the Owner and obtain itemized receipt. This receipt shall be attached to the "Final Application" for payment.

1.11 TESTING, ACCEPTANCES AND GUARANTEE

A. When the systems are completed, the Contractor shall operate equipment. Replace all faulty equipment and make necessary adjustments before final acceptance. Upon final acceptance of work, the Contractor shall a written guarantee that he will make good, at his/her own expense, any defects in materials or workmanship which develop within one (1) year from date of final acceptance.

B. Refer to individual specification sections for additional testing requirements.

C. Occupancy will not be granted until such tests are made to the satisfaction of the project engineer and local inspection authority.

D. Provide four (4) complete operating instructions, operating manuals and repair parts list for the Owner's personnel. Instruct Owner's personnel in the operation of all systems.

E. Perform all tests required by Owner, State, City, County and/or other agencies having jurisdiction.

F. Provide all materials, equipment etc., and labor required for the tests.
SECTION 260519 - ELECTRICAL CONDUCTORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70.
B. Conductor Insulation: Comply with NEMA WC 70 for Types XHHW-2.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

C. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SLEEVES FOR CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. XHHW-2, single conductors in raceway for all conductors.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer’s recommended maximum pulling tensions and sidewall pressure values.

B. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

C. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

D. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."

E. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

F. Tighten electrical connectors and terminals according to manufacturer’s published torquetightening values. If manufacturer’s torque values are not indicated, use those specified in UL 486A and UL 486B.

G. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
2. Perform visual and mechanical inspection.

3. Verify continuity of all installed cables.

END OF SECTION 260519
SECTION 260526 - GROUNDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY
   A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Field quality-control test reports.

1.3 QUALITY ASSURANCE
   A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS
   A. Insulated Conductors: Copper wire or cable insulated for 600 V type XHHW-2.

2.2 CONNECTORS
   A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

PART 3 - EXECUTION

3.1 APPLICATIONS
   A. All conduits serving 120 volt wiring shall include a ground conductor.

3.2 FIELD QUALITY CONTROL
   A. Provide visual verification of the installation. Verify continuity of all ground conductors.

END OF SECTION 260526
SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Hangers and supports for electrical equipment and systems.

1.2 QUALITY ASSURANCE

A. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Tyco International, Ltd.
      g. Wesanco, Inc.

   2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

   3. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
   2. Toggle Bolts: All-steel springhead type.
PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

END OF SECTION 260529
SECTION 260533 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.

B. EMT: ANSI C80.3.

C. FMC: Zinc-coated steel.

D. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Fittings for EMT: Steel Set-screw type.

2. Rigid steel conduit: Threaded fittings.

2.2 NONMETALLIC CONDUIT AND TUBING

A. RNC: NEMA TC 2, Type EPC-40 or 80 PVC, unless otherwise indicated.

B. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
PART 3 - EXECUTION

3.1 RACEWAY APPLICATION
   A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
      1. Exposed Conduit above grade: Rigid steel conduit.
      2. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
      3. Conduit within concrete base: Type EPC-80-PVC.
   B. Comply with the following indoor applications, unless otherwise indicated:
      1. Exposed, Not Subject to Physical Damage: EMT.
      2. Boxes and Enclosures: NEMA 250, Type 1.
   C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.

3.2 INSTALLATION
   A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2
      except where requirements on Drawings or in this Article are stricter.
   B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues or hot-water pipes.
      Install horizontal raceway runs above water piping.
   C. Complete raceway installation before starting conductor installation.
   D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical
      Systems."
   E. Install no more than the equivalent of three 90-degree bends in any conduit run except for
      communications conduits, for which fewer bends are allowed.
   F. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not
      less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each
      end of pull wire.
   G. All raceways installed below grade shall be installed a minimum of 24" below grade and shall
      have a warning tape installed above the raceway.

3.3 INSTALLATION OF UNDERGROUND CONDUIT
   A. Direct-Buried Conduit:
      1. Excavate trench bottom to provide firm and uniform support for conduit.
      2. Install backfill as specified in Division Section "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.

END OF SECTION 260533
LIGHTING CONTROL DEVICES

SECTION 260923 – LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following lighting control devices:

1. Time switches.
2. Outdoor photoelectric switches.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product by one of the following:

2. Intermatic, Inc.
5. Square D; Schneider Electric.
6. TORK.

D. Electromechanical-Dial Time Switches: Type complying with UL 917.
1. Contact Configuration: DPST.
2. Contact Rating: 30-A inductive or resistive, 240-V ac.
3. Eight-Day Program: Uniquely programmable for each weekday and holidays.
4. Skip-a-day mode.
5. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 16 hours.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product by one of the following:

2. Intermatic, Inc.
4. Square D; Schneider Electric.
5. TORK.

D. Description: Solid state, with SPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay or contactor coils complying with UL 773A.

1. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lx), with an adjustment for turn-on and turn-off levels within that range, and a directional lens in front of photocell to prevent fixed light sources from causing turn-off.
2. Time Delay: 15-second minimum, to prevent false operation.
4. Mounting: Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.
PART 3 - EXECUTION

3.1 WIRING INSTALLATION

A. Wiring Method: Comply with Division 26 Section "Electrical Conductors."

B. Wiring within Enclosures: Comply with NEC A 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

C. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.2 IDENTIFICATION

A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."

1. Identify controlled circuits in time clocks.

B. Label time switches and contactors with a unique designation.

3.3 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing time switches and after electrical circuitry has been energized, adjust and test for compliance with requirements.

2. Operational Test: Verify operation of each lighting control device, and adjust time delays.

B. Lighting control devices that fail tests and inspections are defective work.

END OF SECTION 260923
SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

   A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

   A. Extent of each type of masonry work is shown on drawing and in schedules.

   B. Related Work Specified Elsewhere:

      1. Section 013323: Shop Drawings, Product Data and Samples
      2. Section 044000: Dimension Stone
      3. Section 079200: Joint Sealants
      4. Section 321313.13 Exposed Aggregate Concrete Paving

1.3 SUBMITTALS:

   A. Product Data: Submit manufacturer's product data for each type of masonry unit, necessary, and other manufactured products, including certifications that each type complies with specified requirements.

   B. Samples for Initial Selection Purposes: Submit samples of the following materials.

      1. Colored masonry mortar samples showing full extent of colors available.

   C. Samples for Verification Purposes: Submit the following samples:

      1. Unit masonry samples for each type of exposed masonry units required; include in each set the full range of exposed color and texture to be expected in completed work.
      2. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.

1.4 QUALITY ASSURANCE:

   A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surface.

   B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

1.5 DELIVERY, STORAGE AND HANDLING:

   A. Deliver masonry materials to project in undamaged condition.
B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

C. Store cementitious materials off the ground, under cover and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained.

E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 PROJECT CONDITIONS:

A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day’s work. Cover partially completed structures when work is not in progress.

B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

C. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

F. Protect sills, ledges and projections from droppings of mortar.

G. Cold Weather Protection:

1. Do not lay masonry units which are wet or frozen.
2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
3. Remove masonry damaged by freezing conditions.
4. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements:
   a. For units with surface temperatures above 32 degrees F (0 degrees C), wet with water heated to above 70 degrees F (21 degrees C).
   b. For units with surface temperatures below 32 degrees F (0 degrees C), wet with water heated to above 130 degrees F (54 degrees C).
5. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 degrees F (6 degrees C).
   a. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):
      1) Mortar: Heat mixing water to produce mortar temperature between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
      2) Grout: Follow normal masonry procedures.
   b. 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):
1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.

2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.

c. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degree C):

1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.

2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.

3) Heat both sides of walls under construction using salamanders or other heat sources.

4) Use windbreaker or enclosures when wind is in excess of 15 mph.

d. 20 degrees F (07 degrees C) and below:

1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).

2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.

3) Masonry Units: Heat masonry units so that they are above 20 degree F (07 degrees C) at time of laying.

4) Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F (4 degrees C) for 24 hours after laying units.

e. Do not heat water for mortar and grout to above 160 degrees F (71 degrees C).

6. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.

a. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C): Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

b. 32 degrees F (0 degrees C) to 24 degrees F (9-4 degrees C): Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.

c. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C): Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.

d. 20 degrees F (-7 degrees C) and below: Except as otherwise indicated, maintain masonry temperature above 32 degrees F (0 degrees C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 degrees F (4 degrees C) for 48 hours.
PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

B. Concrete Block: Provide units complying with characteristics indicate below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.

1. Grade N.
2. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thickness indicated.
3. Type I, moisture-controlled units.
4. Exposed Faces: Manufacturer's standard color and texture.
5. Hollow Loadbearing Block: ASTM C-90, normal weight except use lightweight wherever exposed to view.
6. Solid Loadbearing Block: ASTM C-145, normal weight except use lightweight wherever exposed to view.

2.2 MORTAR AND GROUT MATERIALS:

A. Portland Cement: ASTM C-150, Type I.
B. Masonry Cement: ASTM C-91.
C. Hydrated Lime: ASTM C-207, Type S.
D. Aggregate for Mortar: ASTM C-144.
E. Aggregate for Grout: ASTM C-404.
F. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

2. Products: Subject compliance with requirements, provide one of the following:
   a. "SGS Mortar Colors"; Solomon Grind-Chem Services, Inc.
   b. "Truce Tone Mortar Colors"; Davis Colors, a Subsidiary of Rockwood Industries, Inc.
G. Water: Clean and potable.

2.3 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

A. Materials: Comply with requirements, indicated below for basic materials with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics.
1. **Hot-Dip Galvanized Steel Wire**: ASTM A-82 for uncoated wire and with ASTM A-153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.

2. **Hot-Dip Galvanized Carbon Steel Sheet**: ASTM A-366, Class 2 or ASTM A-635; hot-dip galvanized after fabrication to comply with SSTM A-153, Class B.

**B. Joint Reinforcement**: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10’, with prefabricated corner and tee units, and complying with requirements indicated below.

1. **Width**: Fabricate joint reinforcement in units with widths of approximately 2” less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8” on joint faces exposed to exterior and 1/2” elsewhere.

2. **Wire Size for Side Rods**: 0.1483” diameter.

3. **Wire Size for Cross Rods**: 0.1483” diameter.

4. **For Multi-Wythe Masonry Provide Type as Follows**:
   
   a. Truss design with diagonal cross rods spaced not more than 16” o.c. and number of side rods as follows:

   1) **Number of Side Rods for Composite Construction**: One side rod for each face shell of concrete masonry back-up and one rod for brick wythe.

5. Use units with adjustable 2-piece rectangular ties where horizontal joints of facing wythe do not align with those of back-up.

**C. Manufacturers**: Subject to compliance with requirements, provide products of one of the following:

1. AA Wire Products Co.
2. Dur-O-Wall, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. Masonry Reinforcing Corp. of America

### 2.4 MISCELLANEOUS MASONRY ACCESSORIES:

**A. Reinforcing Bars**: Deformed steel, ASTM A-615, Grade 60.

**B. Bond Breaker Strips**: Asphalt-saturated organic roofing felt complying with ASTM D-226, Type I (No. 15 asphalt felt).

**C. Weepholes**: Sash cord of length required to produce 2” exposure on exterior and 18” in cavity between wythes.

**D. Isolation Material**: Asphalt impregnated boxboard.

1. **Products**: Subject to compliance with requirements, provide one of the following:

   a. Column Wrap; Boomer Co.
   b. Brak-Bond; Cranco Industries.
   c. Column Box Board; Williams Products.
E. Copper Fabric Flashing: A full, single sheet of 502 copper bonded on both sides to asphalt coated glass fabric with a ductile asphalt, per ASTM B370.
   1. Advanced copper fabric flashing manufactured by Advanced Building Products or approved substitute

2.5 MASONRY CLEANERS:

   A. Job-Mix Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

   B. Acidic Cleaner: Manufacturer's standard strength general purpose cleaner design for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.

      1. Products: Subject to compliance with requirements, provide the following:

         a. "Sure Klean" No. 600 Detergent; ProSoCo, Inc.

2.6 MORTAR AND GROUT MIXES:

   A. General: Do not add admixtures including coloring pigments, air entraining agents, accelerators, retarders, water repellent agencies, anti-freeze compounds or other admixtures, unless otherwise indicated.

      1. Do not use calcium chloride in mortar or grout.

   B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM Standards for mixing time and water content.

   C. Mortar for Unit Masonry: Comply with ASTM C-270, Proportion Specification, for type of mortar required, unless otherwise indicated.

      1. Limit cementitious materials in mortar to Portland Cement-lime.
      2. Use Type S mortar for all masonry, unless otherwise indicated.

   D. Colored Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1-to-10, by weight. Submit color sample to Owner for approval.

   E. Grout for Unit Masonry: Comply with ASTM C-476 for grout for use in construction of reinforced and non-reinforced unit masonry. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.

      1. Use fine grout in grout spaces less than 2" in horizontal directions, unless otherwise indicated.
      2. Use coarse grout in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

2.7 CONCRETE FOR FOOTINGS:

   A. Portland Cement: ASTM C-150, Type 1.
1. Type III may be used for high early strength concrete.
2. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
3. 6 sack mix, 3,500 – 4,000 psi, 28-day compressive strength. W/C 0.35 max, air entrained.

B. Normal Weight Aggregates:
   1. General: ASTM C-33 and as herein specified.
      a. Local aggregates not complying with ASTM C-33, but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.

C. Water: Drinkable.

D. Air-Entraining Admixture: ASTM C-260, certified by manufacturer to be compatible with other required admixtures.

E. Water-Reducing Admixture: ASTM C-494, Type A, and contain not more than 0.1% chloride ions.

2.8 FORM MATERIALS FOR FOUNDATIONS:

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth exposed surfaces. Furnish in larges practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
   1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B Density Overlaid Concrete Form", Class I.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal or other acceptable material. Provide lumber dress on at least 2 edges and for tight fit.

C. Form Ties: Factory-fabricated, adjustable-length, removable metal form ties, designed to prevent deflection and to prevent spalling concrete surfaces upon removal.
   1. Use snap-off ties which will leave no metal closer than 1-1/2” to surface and when removed, will leave holes not larger than 1” diameter in concrete surface.

D. Form Coatings: Commercial formulation form-coating compounds that will not bond with stain, nor adversely affect concrete surface and will not impair subsequent treatments of concrete surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Masonry Installer must examine the areas and conditions under which masonry is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory condition has been corrected in a manner acceptable to masonry Installer.
3.2 INSTALLATION, GENERAL:

A. Do not wet concrete masonry units.

B. Cleaning Reinforcing: Before placing, remove rust, ice and other coatings from reinforcing.

C. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls so the actual thickness of the masonry units, using units of nominal thickness indicated.

D. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

1. Use dry cutting saws to cut concrete masonry units.

3.3 CONSTRUCTION TOLERANCES:

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10'.

B. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

C. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.4 LAYING MASONRY WALLS:

A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other locations.

B. Layout walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not touch. Clean exposed surfaces of set masonry units and mortar prior to laying fresh masonry.

3.5 MORTAR BEDDING AND JOINTING:

A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out fill mortar bed including areas under cells.
B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

D. Tool exposed joints slightly concave using a jointer larger than joint thickness.

E. Remove masonry units disturbed after laying, clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.6 HORIZONTAL JOINT REINFORCEMENT:

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere, lap reinforcing a minimum of 6".

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Reinforce walls with continuous horizontal joint reinforcement, unless specifically noted to be omitted.

D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosure and other special conditions.

E. Space continuous horizontal reinforcement as follows:
   1. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcement acts as structural bond or tie between wythes, space reinforcement as required by Code but not more than 16" o.c. vertically.

3.7 CONTROL AND EXPANSION JOINTS:

A. General: Provide vertical expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

B. Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 30'-0" o.c.

3.8 REPAIR, POINTING AND CLEANING:

A. Keep masonry faces clean during construction whenever possible, i.e. remove all mortar tags and stains before they cure, a light brushing with a soft brush upon initial mortar set.

   1. Minimize condensation in shrinkage wrapped delivered masonry units.
   2. Minimize mortar run-down with wet masonry units.
   3. Protect base of wall from all mortar and mud splashes and remove grout spills immediately.
B. Remove and replace masonry units which are loose, chipped broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence or replacement.

C. Pointing: During the tooling of joints, enlarge any voids or holes, except weepholes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

D. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/3 panel uncleaned for comparison purposes. Obtain Architects approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agency, polyethylene film or waterproof masking tape.
4. Saturate wall surfaces with water prior to application of cleaners, remove cleaners promptly by rinsing thoroughly with clear water.
5. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" using specified masonry cleaners.
6. Clean concrete unit masonry to comply with masonry manufacturer's directions and application NCMA "Tek" bulletins.

E. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION 042000
SECTION 044000 - DIMENSION STONE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of hand set dimensional stonework is shown on drawings.

   1. Dimension stonework with mortar joints
   2. Dimension stonework with sealant joints
   3. Stone cladding system

B. Related work specified elsewhere:

   1. Section 013323: Ship Drawings, Project Data and Samples
   2. Section 042000: Unit Masonry
   3. Section 079200: Joint Sealants

1.3 SUBMITTALS:

A. General: Submit the following in accordance with drawings and specifications as stated herein.

   1. Samples for verification purposes of stone in form of sets for each color, grade, finish, type, and variety of stone required and consisting of stones not less than 12 inches square. Include 2 or more stones in each set of samples showing the full range of variations in appearance characteristics to be expected in completed work.
   2. Colored pointing mortar and grout samples for each color required showing full range of exposed color and texture to be expected in completed work.
   3. Sealant samples for each type and color of joint sealant required.

   a. Sealant compatibility and adhesion test report from sealant manufacturer indicating that stone materials have been tested for compatibility and adhesion with joint sealants; include sealant manufacturer's interpretation of test results relative to material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

B. Samples for each type of stone, stonework accessory, and other manufactured products required.

C. Field Construction Mock-Up: Prepare mock-ups for the following types of dimension stonework. Purpose of mock-ups is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in complete work. Build mock-ups to comply with the following requirements:

   1. Locate mock-ups on site where indicated or, if not indicated, as directed by Landscape Architect.
   2. Build mock-ups for the following types of dimension stonework:
1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an experienced Installer who has completed stone cladding similar in material, design, and extent to that indicated for project that has resulted in construction with a record of successful in-service performance. Installer must have a minimum of (5) years of related construction experience.

B. Single-Source Responsibility for Stone: Obtain each color, grade, finish, type and variety of stone from a single quarry with resources to provide materials of consistent quality in appearance and physical properties, including the capacity to cut and finish material without delaying the progress of the work.

C. Fabricate and install dimension stonework to withstand loads from wind, gravity, and movement as well as to resist deterioration under conditions of normal use including exposure to weather, without failure.

D. Single Source Responsibility for Mortar and Grout Materials: Obtain mortar ingredients of uniform quality and from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

E. Single-Source Responsibility for Other Materials: Obtain each type of stone accessory, sealant, and other materials from one manufacturer for each product.

F. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the engineering, fabricating, and installing of stone cladding to prevent displacement of cladding, opening up of joints, and over stressing of components; failure of joint sealants and connections; and other detrimental effects. Base materials due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg), material surfaces.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to project site in undamaged condition.

B. Store and handle stone and related materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

1. Do not use pinch or wrecking bars.
2. Store stone on wood skids or pallets covered with nonstaining, waterproof membrane. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones.
3. Protect stored stone from weather with waterproof, nonstaining covers or enclosures, but allow air to circulate around stones.
4. Store cementitious materials off the ground, under cover, and in dry location.

1.6 JOB CONDITIONS:

A. Cold Weather Protection: Comply with the following requirements:
   1. Remove ice or snow formed on dimension stonework beds by carefully applying heat until top surface is dry to the touch.
   2. Remove dimension stonework damaged by freezing conditions.

B. Perform the following construction procedures while dimension stonework is progressing:
   1. Temperature ranges indicated apply to air temperatures existing at time of installation.
   2. In heating mortar materials, maintain mixing temperatures selected within 10 deg F (6 deg C); do not heat water for mortar to above 160 deg F (71 deg C).
   3. Mortar at 40 deg F (4.4 deg C) and below, produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) by heating mixing water and, at temperatures of 32 deg F (0 deg C) and below, sand as well. Always maintain temperature of mortar on boards above freezing.
   4. At 25 deg F (-4 deg C) to 20 deg F (-7 deg C), heat both sides of walls under construction and use windbreaks or enclosures when wind is in excess of 15 mph.
   5. At 20 deg F (-7 deg C) and below, provide enclosure and auxiliary heat to maintain an air temperature of at least 40 deg F (4.5 deg C) for 24 hours after setting dimension stonework, and heat stones so that they are above 20 deg F (-7 deg C) at time of installation.

C. Protect dimension stonework both in place and in progress to comply with the following requirements:
   1. Temperature ranges indicated apply to mean daily air temperatures existing at time of installation.
   2. At 40 deg F (4.4 deg C) to 32 deg F (0 deg), protect dimension stonework from rain or snow at least 24 hours by covering with nonstaining weather-resistive membrane.
   3. At 32 deg F (0 deg C) to 20 deg F (-4 deg C), cover dimension stonework completely with nonstaining weather-resistive membrane.
   4. At 25 deg F (-4 deg C) to 20 deg F (-7 deg C), cover dimension stonework completely with nonstaining weather-resistive insulating blankets or similar protection for at least 24 hours.
   5. At 20 deg F (-7 deg C) and below, maintain dimension stonework temperature above 32 deg F (0 deg C) for 24 hours.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Comply with referenced standards and other requirements indicated applicable to each type of material required.
2.2 BLUESTONE:

A. Ashlar Bluestone Veneer: ASTM C616 – Type II Quartzite Sandstone, classification. Bluestones shall be varying heights 6y varying lengths x 3½” thickness (unless specified otherwise) to match residence veneer pattern exactly.


2. The face surface of the stone veneer shall be split faced.

B. Aggregate: ASTM C-144 and as indicated below:

1. For joints narrower than 1/4-inch use aggregate graded with 100 percent passing the No. 8 sieve and 95 percent the No. 16 sieve.

2. For pointing mortar, use aggregate graded with 100 percent passing the No. 16 sieve.

3. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as required to match stone sample.


   a. Available Products: Subject to compliance with requirements, colored mortar pigments that may be incorporated in the work.

   b. Products: Subject to compliance with requirements.

   c. Water: Clean, nonalkaline, and potable.

5. Latex additive (water emulsion) described below, serving as replacement for part for all of gauging water, of type specifically recommended by latex additive manufacturer for use with job-mixed latex-modified materials of type indicated.

   a. Latex Type: Styrene butadiene rubber in factory prediluted form.

   b. Latex Type: Acrylic in factory prediluted or concentrated form.

6. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work.

7. Manufacturers: Subject to compliance with requirements, provide products.

2.3 DIMENSION STONE ANCHORS AND ATTACHMENTS:

A. Provide anchors and attachments of type and size required to support dimensions stonework.

2.4 DIMENSION STONE FABRICATION:

A. General: Fabricate dimension stonework in sizes and shapes required to comply with requirements indicated, including details on drawings and final shop drawings.

B. Cut and drill sinkages and holes in stones for anchors, fasteners, supports as indicated or needed to set dimension stonework securely in place; shape beds to fit supports.

C. Cut stones to produce pieces of thickness, size and shape indicated to comply with fabrication and construction tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.
1. Thickness of Exterior Dimension Stone Cladding System: Provide stone cladding thickness required to comply with performance requirements.
2. Varying height x varying length x 3 1/2" thick.

D. Dress Joints (bed and vertical) straight and at 90-degree angle to face, unless otherwise indicated.

E. Cut stones to produce joints of uniform width and in locations indicated.
   1. Joint width: match existing on residence.

F. Clean sawn backs of stones to remove rust stains and free iron particles.

G. Arrange pattern to match existing veneer on residence. Conform to approved jointing pattern from submitted and approved shop drawings.

H. Carefully inspect finished stones for compliance with requirements relative to qualities of appearance, material, and fabrication; replace defective stones with ones that do comply.

I. Grade and mark stones for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stones match range of colors and other appearance characteristics represented in approved samples and field-constructed mock-ups.

2.5 MORTAR AND GROUT MIXES:

A. General: Comply with referenced standards and with manufacturers’ instructions relative to mix proportions, mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality and with optimum performance characteristics.

B. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or calcium chloride unless otherwise indicated.

C. Mixing: Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer unless otherwise indicated. Discard mortars and grout when they have reached their initial set.

D. Portland Cement/Lime Setting Mortar: Comply with ASTM C-270, Proportion Specification, for types of mortars and stone indicated below:
   1. Set bluestone with Type N mortar.

E. Pointing Mortar: Provide pointing mortar mixed to match stone sample and complying with requirements indicated above for setting mortar for nonpaving applications including type and the following:
   2. Colored Pigmented Grout: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1-to-10 by weight.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine surfaces to receive dimension stonework, and conditions under which dimension stonework will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of dimension stonework. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Advise installers of other work about specific requirements relating to placement of inserts, flashing reglets, and similar items to be used by Stonework Installer for anchoring, supporting, and flashing of dimension stonework. Furnish Installers of other work with drawings or templates showing locations of these items.

B. Protect dimension stonework during erection as follows:

1. Cover top of walls with nonstaining waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold securely in place.
2. Prevent staining of stone from mortar, grout, sealants and other sources. Immediately remove such materials from stone without damage to latter.
3. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

C. Clean stone surfaces that have become dirty or stained prior to setting to remove soil, stains, and foreign materials. Clean stones by thoroughly scrubbing stones with fiber brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh filler or abrasives.

3.3 INSTALLATION:

A. Execute dimension stonework by skilled contractors, and employ skilled stone fitters at the site to do necessary field cutting as stones are set.

1. Use diamond bladed power saws to cut stones; for exposed edges, produce edges that are cut straight and true.

B. Set stones to comply with requirements indicated on Drawings and final shop drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure dimension stonework in place. Shim and adjust anchors, supports, and accessories to set stones accurately in locations indicated with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances.

C. Construction Tolerances: Set stones to comply with the following tolerances:

1. Variation from Plumb: For lines and surfaces of walls, do not exceed 1/4 inch in 10 feet.
2. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed minus 1/4 inch, or plus 1/2 inch.
3.4 SETTING DIMENSION STONWORK WITH SEALANT JOINTS:

A. Attach anchors securely to stones and to backup surfaces.

B. For stones supported on clip or continuous angles, set stones on setting buttons, setting shims, or sheets of resilient low-durometer material.
   1. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to maintain uniform joint widths. Hold buttons at least on joint width back from face of stones.

C. Keep cavities open where unfilled space is indicated between back of stone cladding and backup wall; do not fill cavities with mortar or grout.
   1. Cut bluestone cladding with dampproofing to the extent indicated below:
      a. Stones at Grade: Beds, joints, back surfaces, and on face surfaces to at least 1'-0" above finish grade elevations.
      b. Stones Extending Below Grade: Beds, joints, back surfaces, and on face surfaces to finish grade elevations.
      c. Allow cementitious dampproofing formulations to cure before setting dampproofed stones. Do not damage or remove dampproofing in the course of handling and setting stone.

D. Sealing expansion joints shall be in compliance with Section 079200: Joint Sealants.

3.5 SETTING DIMENSION STONWORK WITH MORTAR:

A. Set stones in full bed of mortar with vertical joints slushed full, unless otherwise indicated.
   1. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to prevent mortar from squeezing out and to maintain uniform joint widths. Hold buttons at least one joint width back from face of stones.
   2. Do not set heavy stones or projecting courses until mortar in courses below has hardened sufficiently to resist being squeezed out of joint.

B. Support projecting stones by props or anchors until wall above is set.

C. Rake out mortar from joints to depths of not less than 1/2 inch nor less than that required to expose sound mortar for joints pointed with mortar, or to provide sufficient depth for sealant and sealant backing for joints pointed with sealants.

D. Prepare stone joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply first layer of pointing mortar in layers not greater than 3/8" inch until a uniform depth is formed; compact each layer thoroughly and allow to become thumb print hard before thumb print hard before applying next layer.

E. Point stone joints by placing and compacting pointing mortar in layers not greater than 3/8 inch.

F. Tool joints with a round joiner having a diameter 1/8 inch larger than width of joint, when pointing mortar is thumb print hard.
3.6 ADJUSTING AND CLEANING:

A. Remove and replace or repair dimension stonework of the following description:

1. Broken chipped, stained, or otherwise damaged stones. Broken, chipped, stained, or otherwise damaged stones may be repaired providing the methods and results are acceptable to Architect.
2. Defective joints.
3. Stones and joints not matching approved samples and field-constructed mockups.
4. Dimension stonework not complying with other requirements indicated.

B. Replace in manner that results in dimension stonework's matching approved samples and field-constructed mock-ups, complying with other requirements, and showing no evidence of replacement.

C. Clean dimension stonework not less than 6 days after completion of work, using clean water and stiff bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.

3.7 PROTECTION:

A. Provide final protection and maintain conditions in a manner acceptable to Fabricator and Installer ensures dimension stonework's being without damage or deterioration at time of Substantial Completion.

3.8 ACCEPTANCE:

A. Refer to Bidding and Contract Requirements.

3.9 CLEANING:

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris and equipment. Repair damage resulting from sodding operations.

END OF SECTION 044000
SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:
A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:
A. Provide all labor, materials, necessary equipment, and services to complete the Joint Sealants work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."
B. Related Work Specified Elsewhere:
   1. Section 033000: Concrete Work
   2. Section 042000: Unit Masonry
   3. Section 321213.40: Exposed Aggregate Concrete Paving
   4. Section 321440.14: Flagstone Paving (Dry Set)

1.3 SAMPLES AND CERTIFICATES:
A. Submit the Following Samples:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6&quot;</td>
<td>long Filler for polyurethane</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Color sample charts Polyurethane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sealants</td>
</tr>
</tbody>
</table>

B. Submit the Following Certificates for Compliance:

<table>
<thead>
<tr>
<th>Description</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyurethane (two components)</td>
<td>Per Specifications (TT-S-00227E, Type Class A</td>
</tr>
<tr>
<td></td>
<td>ASTM C-920, TYPE M, Grade P, Class 25</td>
</tr>
</tbody>
</table>

1.4 COOPERATION:
A. Work of this section shall be provided and coordinated as required through procedures of construction that will insure safety.

1.5 GUARANTEE:
A. Furnish written guarantee for all sealant work stating that said work shall be free from any defects of material and/or workmanship for a period of five (5) years, commencing on the date of final completion and acceptance.
B. Said Guarantee Shall Further State that Sealants are Guaranteed Against:
   1. Adhesive or cohesive failure of sealants in joints where movement is under maximum of +25% extension or +25% compression for two component polyurethane base sealant.
   2. Any crazing greater than 3 mils in depth developing on the surface of the sealant material.
3. Any staining of the surfaces adjacent to the joints, by the sealants, primers, or joint filler materials, by migration through the adjacent materials in contact with them.
4. Any puncture, abrasion or tear failure due to pedestrian or vehicular traffic in self-leveling polyurethane base sealant installed at traffic surfaces.
5. Any visible chalking or color change on the cured surface of the sealant.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER'S AND MATERIALS:

A. Multi component chemically curing, polyurethane base sealant shall be manufactured to meet the specified requirements by the following manufacturer:

1. Tremco Corp., Contact: Construction Technical Services, Telephone (216) 292-5000, Fax (216) 766-5535.

B. Manufacturer's label shall indicate the expiration date of use of sealants or manufacturer shall otherwise attest to the date of manufacture. The period of time lapsed shall not be longer than six (6) months for polyurethane from the date of manufacturer to the date of usage on the job.

C. Primers where required shall be as recommended by the sealant manufacturer.

D. The color of sealants shall be as selected by Architect or as called for on drawings.

E. Bond-breakers where required shall be as recommended by the sealant manufacturer.

2.2 VERTICAL EXPANSION JOINTS:

A. Sealants at vertical joints shall be a multi-component polyurethane base sealant of a non-sag consistency non-staining by migration through the building materials and meeting or equal to requirements specified by the following manufacturer:


2. Guarantee as herein before specified.

2.3 HORIZONTAL EXPANSION JOINTS: (Subject to Vehicular or Pedestrian Traffic):

A. Sealant at horizontal joints of self-leveling consistency, meeting or equal to requirements specified by the following manufacturer:

1. Tremco THC 900 or 901 multi-component chemically and polyurethane based sealant per Fed. Spec. TT-S-00227E, Type 1, Class A, ASTM C-920 Type M, Grade P, Class 25.

2.4 FILLER MATERIAL FOR VERTICAL AND HORIZONTAL JOINTS:

A. Filler material shall be a non-impregnated closed-cell, supporting type, compressible resilient, free from tar, asphalt, oil and other foreign substances. Filler shall be a closed-cell polyethylene foam, or isomeric polymer foam (polystyrene will not be allowed). Filler shape shall be such that sealant in joint is fully supported against puncture or pressure, but of design to prevent sealant from being forced out of joint by contraction. Filler shall have characteristics of not bonding with sealant, surface of filler. Filler shall be at least 25% wider than width of joint
measured in field to which it is applied. Compression on such installed filler shall be sufficient so as to allow no displacement.

1. Closed-cell polyethylene joint filler foam backer rod material shall comply with ASTM D-1622.

2. Where joint design, or depth of joint will not permit the use of joint backing, a bondbreaker tape must be installed to prevent three-sided adhesion. An adhesive backed polyethylene tape should be used.

2.5 EXPANSION JOINT CAPS:

A. Removable expansion joint caps manufactured by:
   1. Contie
   2. Greenstreak

B. Used with expansion joint filler, ready for sealant after removal.

PART 3 - EXECUTION

3.1 JOINT DIMENSIONS:

A. The depth of a joint is defined as the distance from the outside face of the joint to closest point of joint filler, whether joint is rod shaped.

B. Minimum size of joint should be four times the anticipated movement. Minimum joint dimension is 3/8" (9.5mm) x 3/8" (9.5mm), to allow for adequate cleaning and priming.

C. For joints 1/2" (13mm) and wider, the depth of the sealant should be no more than 1/2" (13mm) deep.

D. Joints to receive sealants shall be never less than 1/4" depth by 1/4" width.

E. Joints larger than the above stated minimum dimensions shall be provided in accordance with manufacturer's standard printed specifications and recommendations.

F. The General Contractor shall determine and provide joints of dimensions as specified herein before.

3.2 JOINT INSPECTION:

A. Inspect all joints which are to receive work of this section and notify Architect of dimensions and/or any existing conditions which will prevent satisfactory installation and performance of the sealants.

B. Commencement of work on any joint shall be considered full acceptance of dimensions and condition of said joint.

C. Joints to be sealed shall be thoroughly cleaned of mortar or any other foreign material in an approved manner before any sealant materials are applied. Any coating from metal surfaces shall be removed by use of solvent recommended by manufacturer of metal. Solvent shall not be allowed to air dry without wiping.
D. Concrete and masonry surfaces shall be fully cured, free of release agents, curing compounds, loose aggregate and other surface treatments. Treated surfaces shall be tested for adhesion before proceeding with sealant work.

E. Joint spaces and surfaces shall be thoroughly dry before installation of sealant materials. Unless approved means of drying joint is employed, do not install sealant material when temperature is below 40 degrees F or during and after rain and fog. To test for free moisture, run paper towel or paper napkin through joint. Paper shall be completely dry. Any alkaline seepage from fresh concrete shall be washed away, surface dried.

3.3 GENERAL WORKMANSHIP AND APPLICATION:

A. Use thoroughly experienced workmen in the application and as per manufacturer's recommendations.

B. Primer shall be used as it comes from can, unadulterated. Apply as per manufacturer’s printed directions and/or recommendations. Prime joints before insertion of joint filler material.

C. Fill joint with filler material so that depth and width of joint have relationships as noted hereinafter under "Joint Dimensions".

D. When installing rod stock filler, roll filler into joint. Rod filler in final position shall not be twisted.

E. Bond-breaker strip shall be used in joints where sufficient room for back-up does not exist.

F. In mixing sealant compound components, do not whip excessive air into said materials. Mix strictly as recommended by manufacturer.

G. Sealant materials shall be applied within "application life" recommended by manufacturer for prevailing temperature and humidity conditions. Do not retemper.

H. Protect exposed surfaces adjacent to joints to prevent permanent staining or other damage to adjacent work. Be fully responsible for any staining and/or other damage caused under work of this section to any adjacent work.

I. If manufacturer indicates there is any possibility of color of sealant material being changed by use of wetting agents while tooling, Contractor shall dry tool.

J. Joints shall be lightly tooled into place immediately after application, when necessary to give concave shaped surface.

K. Immediately after application of sealants, thoroughly clean adjacent surfaces which may have been soiled, as per sealant manufacturer recommendations. Leave work in neat and clean conditions to full satisfaction of Architect.

3.4 GENERAL PERFORMANCE:

A. Sealants: Except as otherwise indicated, joints are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealants to comply with these requirements will be recognized as failures of materials and workmanship.
END OF SECTION 079200
SECTION 129300 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:
   A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:
   A. Provide all labor, materials, necessary equipment and services to complete the Site Furnishings work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated on "NIC ITEMS."

1.3 SUBMITTALS:
   A. Manufacturer's Data:
      1. Descriptive data of installation, methods, procedures and maintenance.
   B. Complete shop drawings for all items of work under this section indicating all details of fabrication and installation, including sizes, shapes, finishes, colors, thickness, material quality and all other related work applicable to the items of this section.

1.4 DELIVERY, STORAGE AND HANDLING:
   A. Deliver all materials with manufacturer's tags and labels intact.
   B. Store and handle so as to avoid damage.

PART 2 - PRODUCTS

2.1 BENCHES:
   A. Manufactured by Landscape Forms Inc. (800) 430-6209, or approved equal.
   B. Quantity: (3)
   C. Model: Wellspring Bench
      1. Seat length – 73 ½"
      2. Seat height 17 ½"
      3. Seat quantity – Four
      4. Arm options – None
      5. Mounting – Surface mount
      6. Wood - Teak

PART 3 - EXECUTION

3.1 WORKMANSHIP AND INSTALLATION:
   A. Provide as indicated and detailed on the drawings, and as per manufacturer's standard printed specifications, installation instructions and recommendations.
   B. Provide complete shop drawing and manufactured cut sheets on all manufactured items.
C. Review layout of benches with Wayne State University prior to installation.

END OF SECTION 129300
SECTION 312000 - EARTHWORK FOR SITE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of earthwork and site grading is shown on drawings.

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 024113: Site Demolition
3. Section 312500: Soil Erosion and Sedimentation Control
4. Section 321216: Asphalt Concrete Paving
5. Section 321313.13: Exposed Aggregate Concrete Paving
6. Section 321440.14: Flagstone Paving (Dry Set)
7. Section 324600: Underdrainage System
8. Section 329119: Topsoil
9. Section 329223: Sodding
10. Section 329300: Plants
11. Section 334000: Storm Drainage Facilities

1.3 SUBMITTALS:

A. Test Reports: Submit copies of following reports directly to Architect. All test reports must be signed by licensed Engineer.

1. Test reports on borrow material.
2. Field density test reports.
3. One optimum moisture-maximum density curve for each type of soil encountered.
4. Other tests and materials certificates as required.

1.4 QUALITY ASSURANCE:

A. Codes and Standards: Perform earthwork and site grading in compliance with applicable requirements of governing authorities having jurisdiction.

B. Testing and Inspection Service: Contractor will engage testing and inspection service, to perform testing of soil materials proposed for use in work and to provide field facilities for quality control testing during earthwork and site grading operations.

1. Cooperate with soil testing and inspection service as it obtains samples of soil materials and furnish testing service with necessary samples of haul-in fill.

C. Tests for Proposed Soil Materials: Test soil materials proposed for use in work and promptly submit test result reports.
1. Provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills. Determine maximum densities in accordance with ASTM D-1557 (AASHTO T 180).
   a. Analyze material within three feet of finished grades of paved areas to determine frost susceptibility.
   b. Testing service will determine suitability of materials to be used in fill.

2. For borrow materials, perform a mechanical analysis (AASHTO T 88) plasticity index (AASHTO T 90), moisture-density curve (AASHTO T 180 or ASTM D-1557), and frost susceptibility analysis.

D. Comply with provisions of soil erosion and sedimentation control plan.

1.5 JOB CONDITIONS:

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data are made available for convenience of Contractor.

1. Additional test borings and other exploratory operations may be made by Contractor at no cost to Owner.

B. Existing Utilities: Locate existing underground utilities in areas of work before starting earthwork operations. Where utilities are to remain in place, provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner, and public and private utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

C. Use of Explosives: Use of explosives is not permitted.

D. Temporary Protection: Barricade open excavations made as part of earthwork operations and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.

1. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

2. Perform excavation within drip-line of large trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition of root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

E. All existing and proposed utility structures, including but not limited to manholes, catch basins, etc. that lie within the limit of work or areas affected by work on this project shall be adjusted to grade by the Contractor or the respective utility company for which the Contractor is responsible to coordinate.
PART 2 - PRODUCTS

2.1 DEFINITIONS:

A. Satisfactory soil materials are defined as those complying with ASTM D-2487 soil classification groups GW, GP, GM, SM, SW AND SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D-2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.


D. Cohesive Soil Materials: Include clayey and silty gravels, sand-clay mixtures, gravel-silt mixtures, clayey and silty sands, sand-silt mixtures, clays, silts and very fine sands.

2.2 SOIL MATERIALS:

A. Backfill and Fill Materials: Use satisfactory soil materials for backfill and fill, free of rock or gravel larger than 2” in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter and complying with the above definitions.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine the areas and conditions under which earthwork for site is to be performed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 EXCAVATION:

A. General: Excavation consists of removal and disposal of materials encountered when establishing required grade elevations.

B. Unauthorized excavation consists of removal of material beyond indicated elevations or side dimensions without the specific direction of Architect. Replace unauthorized excavation by backfilling and compacting as specified for authorized excavations of same classification, unless otherwise directed by Architect. Cost of unauthorized excavation and remedial backfill shall be borne by Contractor.

C. Additional Excavation: When excavation has reached required subgrade elevations, notify Architect to allow for inspection of conditions.

   1. If unsuitable materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect.
   2. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

D. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations, and flooding project site and surrounding areas.
1. Establish and maintain temporary drainage ditches or diversions to convey water removed from excavations and rain water to collecting or run-off areas. Do not use trench excavations for site utilities as temporary drainage ditches.

E. Material Storage: Stockpile excavated materials classified as satisfactory soil material. Do not allow water to accumulate in excavation. Remove water from excavations to prevent softening of foundation bottoms, undercutting footings and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from site where directed, until required for fill. Place stockpiled fill materials away from edges of excavation, grade and shape stockpiles for proper drainage.

1. Do not store fill materials within drip line of trees indicated to remain.
2. Dispose of excess unsatisfactory soil material, trash and debris as specified.

F. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F (1 degree C).

3.3 COMPACTION:

A. General: Control soil compaction during construction to provide the percentage of density specified for each area classification.

B. Percentage of Maximum Density Requirements: Compact soil to not less than following percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship determined in accordance with ASTM D-1557; and not less than following percentages of relative density, determined in accordance with ASTM D-2049, for soils which will not exhibit well-defined moisture-density relationship.

1. Lawn or Unpaved Areas: Compact top 6” of subgrade and each layer of backfill or fill material at 85% maximum density for cohesive soils or 90% relative density for cohesionless material.
2. Walkways: Compact top 6” of subgrade and each layer of backfill or fill material at 90% maximum density for cohesive soil or 95% relative density for cohesionless material.
3. Pavements and Slabs-On-Grade: Compact top 12” of subgrade and each layer of backfill material at 90% maximum density for cohesive material or at 95% relative density for cohesionless material.

C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or to layer of soil material. Apply water in such manner as to prevent free water from appearing on surface during or subsequent to compaction operations.

1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to satisfactory value.

3.4 BACKFILL AND FILL:

A. General: In excavations, use satisfactory excavated or borrow material, unless otherwise indicated that has been sampled, tested and approved by soil testing agency. Place in layers to required subgrade elevations indicated.
1. Under grassed areas, use satisfactory excavated or borrow material.

B. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials from ground surface prior to placement of fills. Plow, strip or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

1. When existing ground surface has density less than that specified under "Compaction" for particular area classification, break-up the ground surface, pulverize, moisture-condition to optimum moisture content and compact to required depth and specified percentage of relative density.

C. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment and not more than 4" loose depth for material compacted by hand-operated equipment.

1. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content of soil material. Compact each layer to required percentage of maximum dry density or relatively density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.

2. Backfill excavations as promptly as work permits, but not until completion of inspection, testing, approval and recording location of underground utilities, as required.

3.5 GRADING:

A. General: Uniformly grade areas within limits of site grading under this Section, including adjacent transition areas. Smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 1" above or below required subgrade elevations, compacted as specified, and free from irregular surface changes.

3.6 FIELD QUALITY CONTROL:

A. Make at least one field density test of subgrade for every 2000 sq. ft. of paved areas, but in no case less than 3 tests.

3.7 MAINTENANCE:

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

1. Repair and reestablish grades in settled, eroded and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact
and replace surface treatment. Restore appearance, quality and condition of surface of finish to
match adjacent work and eliminate evidence over estimation to greatest extent possible.

3.8 DISPOSAL OF EXCESS AND WASTE MATERIALS:

A. Removal from Owner's Property: Remove waste materials, including excavated material
classified as unsatisfactory soil material, trash and debris and legally dispose of it off Owner's
property.

END OF SECTION 312000
SECTION 312500 - SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of soil erosion and sedimentation control is shown on drawings.

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 024113: Site Demolition
3. Section 312000: Earthwork for Site

1.3 QUALITY ASSURANCE:

A. Part 91, Soil Erosion and Sedimentation Control of the Natural Resource and Environmental Protection Act, Act 451 of the Public Acts of 1994, as amended, State of Michigan, requires that all site work be in compliance with the requirements of the Act and that a permit be obtained before starting work.

B. Current edition of Michigan Department of Transportation (MDOT) "Standard Specifications for Highway Construction".

C. Contractor shall pull permit and post an erosion control performance bond, as required, prior to any earth change.

D. Continually inspect for soil erosion and sediment control compliance. Correct deficiencies within 24 hours.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Provide materials as necessary to comply with MDOT Section 208 Soil Erosion and Sedimentation Control. All material proposed for use shall be subject to approval and modification by the Owner's Representative and the local enforcing agency.

PART 3 - EXECUTION

3.1 GENERAL:

A. Comply with requirements of the Soil Erosion and Sedimentation Control Act.

B. Install temporary erosion control measures before construction begins.

1. Install all required erosion control filters over storm sewer structures, prior to demolition operation.
2. Schedule and perform construction operation so that preventative soil erosion control measures are in place prior to excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations.

C. Select borrow and fill disposal areas with full consideration for soil erosion and sediment control.

D. Take special precautions in the use of construction equipment to prevent situations that promote erosion.

E. If the site is over five acres or within 500' of a lake or stream, then a national pollutant discharge elimination system (NPDES) permit for storm water discharge for the construction activities is required prior to any earth change.

F. Inlet filters are required at all catchbasins, existing and proposed.

G. Periodically remove collected silt and sedimentation as required where erosion control measures are implemented.

3.2 CLEANUP:

A. Remove temporary erosion control measures at completion of construction, unless otherwise directed by Architect to remain in place. Exercise caution during removal to minimize siltation of nearby drainage courses.

   1. Remove any mud and soil tracked from site onto adjoining public streets, daily.

END OF SECTION 312500
SECTION 320536 - LANDSCAPE MAINTENANCE AND WARRANTY STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. The requirements of this section include a one-year warranty period from date of acceptance of installation.

B. Related Work Specified Elsewhere:
   1. Section 329119: Topsoil
   2. Section 329223: Sodding
   3. Section 329300: Plants

1.3 ACCEPTANCE OF INSTALLATION:

A. At the completion of all landscape installation, or pre-approved portions thereof, the Landscape Contractor shall request in writing an inspection for acceptance of installation in which the Landscape Contractor, Landscape Architect and Owner's Representative shall be present. After this inspection a "Punch List" will be issued by the Landscape Architect and/or Owner's Representative. After completion of punch list items, the Landscape Architect, Contractor and Owner's Representative shall re-inspect the project and upon satisfactory completion of punch list items, issue a written statement of acceptance of installation and establish the beginning of the project warranty period.

B. It is the responsibility of the Landscape Contractor to make the above written request for inspection of installation in a timely fashion. If there is plant material loss prior to the Landscape Contractor's written request for inspection of installation, the Landscape Contractor shall make all replacements of this dead material at no additional cost. These replacements are not considered to be the required one (1) replacement of dead plant material by the Landscape Contractor during the two (2) year project warranty period, as outlined below.

C. Landscape work may be inspected for acceptance in parts agreeable to Owner's Representative and Landscape Architect provided work offered for inspection is complete, including maintenance as required.

D. For work to be inspected for partial acceptance, supply a written statement requesting acceptance of this work completed to date.

1.4 PROJECT WARRANTY:

A. The project warranty period begins upon written acceptance of the project installation by Landscape Architect and Owner's Representative.

B. The Landscape Contractor accepts responsibility for the irrigation system operation, watering schedule, watering amounts and monitoring system for duration of maintenance and warranty period.
C. The Landscape Contractor shall guarantee trees, shrubs, ground cover bed and sodded areas through construction and for a period of two years after date of acceptance of installation against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Contractor's control.

D. The Landscape Contractor shall warranty plants due to overwatering or under watering by automatic irrigation system during maintenance and warranty period.

1.5 MAINTENANCE:

A. To insure guarantee standards, the following maintenance procedures shall be executed during construction and for the full project warranty period.

B. Maintenance of Plants:

1. Landscape Contractor shall be responsible for only one (1) replacement of any plant materials after project acceptance date, see Section 1.03, that are dead or in the opinion of the Landscape Architect are in an unhealthy or unsightly condition, or having lost natural shape, resulting from die back, excessive pruning, excessive or deficient watering practices, or inadequate or improper maintenance as part of the guarantee. Prior to any replacements Landscape Contractor shall review individual plants in question with Landscape Architect and determine the reason for plant demise.

2. Replacements must meet specifications i.e. quality, species of plant material and planting procedures to receive approval of replacement materials by Landscape Architect.

3. Costs for replacements are assumed part of bid quotations and therefore will not result in an additional cost to Owner or Landscape Architect.

4. Areas damaged as result of replacement operations are to be restored by Contractor at no cost to the Owner or Landscape Architect.

5. The Contractor shall be responsible for keeping guy wires taut, raise tree balls which settle, furnish and apply sprays as necessary to keep the plantings free of disease and insects until the end of the warranty period. All evergreens shall be watered thoroughly and wilt proofed in the fall to insure they do not go into the winter dry.

6. Winter Evergreen Protection (Trees and Shrubs): Treated burlap (green) and 2' x 2' x 8' hardwood stakes @ 4'-0" O.C. Attach burlap to wood lath with roofing nails. Contractor shall erect, remove and deliver to Owner. Contractor shall install winter protection the first winter, install December 1 and remove April 15. Install screen height as required. Spray evergreens with wiltproof prior to December 1 and again January 1, two coatings are required; apply per manufacturer's recommendations.

7. The Contractor shall be responsible for watering of all plantings throughout construction, maintenance and warranty periods.

8. The Contractor will be responsible for irrigation system operation, watering schedules, watering amounts and general monitoring of irrigation system throughout construction, maintenance and warranty period. Overwatering or lack of from irrigation system source is the responsibility of the Landscape Contractor.

9. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition. Remove rejected plants and materials promptly. Make replacements following normal planting schedule. Replace trees and shrubs which are in doubt, unless, in opinion of Owner's Representative and Landscape Architect it is advisable to extend warranty period for a full-growing season. Remove all stakes, guy wires, tree wrap paper, dead twigs and branches from tree and plant materials at the end of this warranty period. Keep planting beds free of weeds during guarantee period. See Trees, Plants and Ground Covers Section for suggested herbicides.
C. Maintenance of Sodded Lawn Area:

1. Maintain sodded lawn areas, including watering, fertilizing, spot weeding, mowing, application of herbicides, fungicides, insecticides, and resodding until a full, uniform stand of sod is knitted to topsoil.

2. Water sod thoroughly, as required to establish proper rooting.

3. Repair, rework and resod all areas that have washed out or are eroded. Replace undesirable or dead areas with new sod.

4. Provide a uniform stand of grass by watering, mowing, and maintaining lawn areas until acceptance of installation. Resod areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by Landscape Architect.

5. Mow lawn areas as soon as lawn top growth reaches a 3” height. Cut back to 2” height. Repeat mowing as required to maintain specified height. Not more than 40% of grass leaf shall be removed at any single mowing. Minimum of two cuttings.

6. Sodded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, even colored viable lawn is established, free of weed, undesirable grass species, disease, and insects.

7. After acceptance of installation, and for the duration of the project warranty period the Landscape Contractor shall continue all maintenance procedures including fertilizing, weeding, rolling, regrading, resodding and applying herbicides, fungicides, insecticides as required to establish a smooth acceptable lawn, free of eroded or bare areas. The Landscape Contractor is not responsible for mowing after acceptance of installation.

8. See Section 1.5 B: Items 7 and 8.

9. At Conclusion of project warranty period and after receiving written final acceptance by Owner's Representative and Landscape Architect, the Owner shall assume all sodded lawn maintenance responsibilities.

1.6 FINAL ACCEPTANCE:

A. At the conclusion of the project warranty period the Landscape Contractor shall request a project inspection for final acceptance in which the Landscape Contractor, Landscape Architect and Owner's Representative shall be present. After this inspection a "Punch List" will be issued by the Landscape Architect. Upon completion of all punch list items, the Landscape Architect and Owner's Representative shall reinspect the project and issue a written statement of final acceptance. Upon final acceptance the Owner assumes all maintenance responsibilities for the landscape of the project.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 320536
SECTION 321440.14 - FLAGSTONE PAVING (DRY SET)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of flagstone paving is shown on drawings, random rectangular pattern.

B. Types of flagstone paving and applications include the following:
   1. Dry set on aggregate base

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 013323: Shop Drawings, Product Data and Samples

1.4 SUBMITTALS:

A. Samples: Submit the following for Landscape Architect review and approval prior to proceeding with construction:
   1. Aggregate Base Stone: Submit one gallon sample, include source location, and sieve analysis test report confirming aggregate to be installed meets or exceeds specified base course aggregate. Refer to Table 1.
   2. Bedding Sand: Submit one quart sample of specified bedding sand, include source location, and sieve analysis test report confirming bedding sand to be installed meets or exceeds specified bedding sand. Refer to Table 2.
   3. Polymeric Joint Sand: Submit one quart sample of specified polymeric joint sand, including manufacturer product data sheets. Refer to Table 3.
   4. Flagstone Paving: Submit samples made up of actual stone color and texture requested. Include in each set of samples the full range of exposed color and texture to be expected in the completed work.

B. Product Data: Manufacturer's technical data for each manufactured product, including certification that each product complies with the specified requirements. Include instructions for handling, storage, installation, protection, and maintenance of each product.

1.5 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an Installer who has successfully completed within the last three years at least three natural stone paving applications similar in type and size to that of this project and who will assign masons from these earlier applications to this project, of which one will serve as lead mason.

B. Field-Constructed Mockup: Prior to installation of flagstone paving, fabricate mockup using materials, pattern and joint treatment indicated for project work, including special features for expansion joints and contiguous work. Build mockup in form of panel at the site, in location as directed, of full thickness and approximately 4’ x 3’. Provide range of color, texture and workmanship to be expected in the completed work. Obtain landscape architect’s acceptance
of visual qualities of mockup before start of brick paving work. Retain mockup during construction as a standard for judging completed bluestone paving work. Do not move or destroy mockup until work is completed.

C. Do not change source of paving or setting materials during progress of work.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Protect stone pavers during storage and construction against wetting by rain, snow or ground water and against soillage or intermixture with earth or other types of materials.

B. Do not store bedding sand and jointing sand on compacted aggregated base course or in areas that channel water into the sand. Cover bedding and jointing sand with waterproof coverings. Secure covering in place.

1.7 PROJECT CONDITIONS:

A. Cold Weather Protection:
   1. Frozen Materials: Do not use frozen materials or materials mixed or coated with ice or frost.
   2. Frozen Work: Do not build on frozen subgrade or setting beds. Remove and replace stone work damaged by frost or freezing.

PART 2 - PRODUCTS

2.1 FLAGSTONE PAVERS:

A. Material: Lake Erie Sandstone (reclaimed) Supplied by: Select Stone Company, Monclova, OH Ph#: (866) 519-3570

B. Edges: Quarry Cut.

C. Size: 2 ¼" thick x varying length and width, see drawings.

D. Color: Blue / Gray range only.

E. Submit full range samples for approval prior to obtaining material (3 total).

2.2 AGGREGATE BASE COURSE:

A. The base course shall be crushed 21AA limestone compacted to minimum 95% ASTM designation D-I557. The base course stone shall conform to the grading requirements of ASTM D2940 and as shown in Table 1

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2 in. (37.5 mm)</td>
<td>100</td>
</tr>
<tr>
<td>1&quot; (25.0 mm)</td>
<td>85 to 100</td>
</tr>
<tr>
<td>3/4&quot; (19.0 mm)</td>
<td>-</td>
</tr>
<tr>
<td>1/2&quot; (12.5 mm)</td>
<td>50 to 75</td>
</tr>
</tbody>
</table>

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2.3 BEDDING SAND:

A. Bedding sand shall be well graded, clean, non-plastic and free from deleterious or foreign matter. The sand shall be sub-angular in shape from natural or manufactured from crushed rock. Limestone screenings, stone dust or blast furnace slag shall not be used. Do not use Mason sand or sand conforming to ASTM C144 for bedding sand.

B. Grading sand samples for the bedding course shall be done according to the requirements of ASTM C136. The bedding sand shall conform to the grading requirements of ASTM C-33 as shown in Table 2.

Table 2
Grading Requirements for Bedding Sand – ASTM C-33

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8” (9.5 mm)</td>
<td>100</td>
</tr>
<tr>
<td>No. 4 (4.75 mm)</td>
<td>95 to 100</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
<td>85 to 100</td>
</tr>
<tr>
<td>No. 16 (1.18 mm)</td>
<td>50 to 85</td>
</tr>
<tr>
<td>No. 30 (0.600 mm)</td>
<td>25 to 60</td>
</tr>
<tr>
<td>No. 50 (0.300 mm)</td>
<td>10 to 30</td>
</tr>
<tr>
<td>No. 100 (0.150 mm)</td>
<td>2 to 10</td>
</tr>
</tbody>
</table>

2.4 JOINT SAND:

A. Joint sand shall be well graded, clean, non-plastic, and free from deleterious or foreign matter. The sand shall be sub-angular in shape from natural or manufactured from crushed rock.

B. Grading sand samples for the joints shall be done according to the requirements of ASTM C-136.

C. The joint sand shall be Techni-Seal RG Polymeric Sand conforming to the grading requirements of ASTM C-144 as shown in Table 3 below.

Table 3
Grading for Joint Sand – ASTM C-144

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Natural Sand</th>
<th>Manufactured Sand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Passing</td>
<td>Percent Passing</td>
</tr>
<tr>
<td>No. 4 (4.75 mm)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
<td>95 to 100</td>
<td>95 to 100</td>
</tr>
<tr>
<td>No. 16 (1.18 mm)</td>
<td>70 to 100</td>
<td>70 to 100</td>
</tr>
<tr>
<td>No. 30 (0.600 mm)</td>
<td>40 to 75</td>
<td>40 to 100</td>
</tr>
<tr>
<td>No. 50 (0.300 mm)</td>
<td>10 to 35</td>
<td>20 to 40</td>
</tr>
<tr>
<td>No. 100 (0.150 mm)</td>
<td>2 to 15</td>
<td>10 to 25</td>
</tr>
<tr>
<td>No. 200 (0.075 mm)</td>
<td>0 to 5</td>
<td>0 to 10</td>
</tr>
</tbody>
</table>

D. Color: Tan or Grey. Submit samples to Wayne State University for approval. Install per manufacturers guidelines.
PART 3 - EXECUTION

3.1 EXAMINATION:

A. Installer must examine the areas and conditions under which fieldstone paving is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION, GENERAL:

A. Do not use fieldstone with chips, cracks, voids, discoloration or other defects beyond acceptable standards which might be visible or cause staining in finished work.

B. Cut fieldstone with motor-driven saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting.

C. Set fieldstone in random rectangular patterns shown and with uniform joints of width and alignment indicated.

D. Tolerances: Do not exceed a tolerance of 1/8" in 10' from level or slope as indicated for finished surface of paving.

E. Subgrade:

1. Assure subgrade is suitable material for specified paving installation. If not, Contractor shall excavate unsuitable material and replace with suitable material.

2. Subgrade shall be fine graded, wet and compacted to 95% modified proctor density.

F. Aggregate Base Course:

1. Install aggregate base course only after sub-grade has been approved.

2. Base course shall be spread in 4" layers to a depth specified on details and compacted to 95% modified proctor density (ASTM D-1557).

3. Aggregate base course shall extend a minimum of 6" beyond edge restraints per details or where applicable.

4. Allowable local tolerance of plus or minus 1/4" in 10'.

G. Sand Bedding Course:

1. Spread bedding sand to a uniform depth of 1 inch (plus or minus 3/16") and screed level or to grade. Do not use bedding sand to fill in low spots or to bring the pavement to correct grade.

2. Screed rails shall not exceed 8'-12' o.c. spacing.

3. Screed sand without compaction to a level slightly higher than the final thickness of the layer.

H. Flagstone Paving:

1. Place stone pavers by hand in specified pattern, with nominal 3/16" space between the pavers and where abutting concrete

2. Work stone pavers from centers of paving field out in all directions so equal cut pieces occur from side to side.
3. At edges and corners where pavers require cutting, do so by using a wet mason saw with a diamondblade or approved method. Note all cut edges shall be uniform and true to each individual paver and paving field edge. All cuts shall be made on job site.

I. Setting Pavers:

1. Entire paving fields shall be vibrated to their final level by minimum of three (3) passes of a vibrating plate compactor according to manufacturer's specifications. The first pass of the compactor shall be done without jointing sand spread on the surface. Protect pavers when compacting with a rubber liner attached to the bottom of the compactor or other approved cushion material.

2. Note, after first vibration pass, dry polymeric joint sand shall be brushed over the surface of all paver fields until joints are full. Vibrate into joints with minimum of three (3) additional passes of the plate vibrator or as needed. Do not install joint sand that is wet or over wet surfaces.
   a. Repeat the sanding of joints and vibrating sand into joints three (3) times.
   b. Do not vibrate pavers within 6 feet of unrestrained edges.

3. Surplus material shall be swept from the surface and entire site left clean.

4. Do not use units with excessive chips, cracks, voids, discolorations, or other defects which might be visible or cause staining in finished work.

5. Set units in patterns shown and with uniform joints as indicated on the drawings.

6. Tolerances: Maintain surface plane for finished paving not exceeding a tolerance of 1/4" in 10’ when tested with a 10’ straight edge.

7. Installation and workmanship of all fieldstone shall be provided as per industry standards.

3.3 REPAIR, PROTECTION:

A. Remove and replace fieldstone that is, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment to eliminate evidence of replacement.

B. Cleaning: Remove excess sand from exposed stone surfaces.

C. Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures stone paving work being without damage or deterioration at time of substantial completion.

END OF SECTION 321440.14R
PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements and General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of irrigation system work is shown on drawings and by provisions of this Section.

B. The sprinkler system shall be constructed using sprinklers, valves, piping, fittings, wiring, etc., of size and types as shown on drawings and as called for in these specification. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.

C. Sprinkler lines shown on the drawings are essentially diagrammatic. Spacing of the sprinkler heads or quick coupling valves are shown on the drawings and shall be exceeded only with the permission of the Owner's authorized representative

D. Unless otherwise specified or indicated on the drawings, the construction of the sprinkler system shall include the furnishing, installing and testing of all mains, laterals, risers and fittings, sprinkler heads, quick coupling valves, control valves, and other necessary specialties and the removal and/or restoration of existing improvements, excavating and backfill, and all other work in accordance with plans and specifications as required for a complete system.

E. Related Work Specified Elsewhere:

1. Section 329219: Seeding
2. Section 329223: Sodding
3. Section 329300: Plants

1.3 SUBMITTALS:

A. Submit specific product information including make and model number to the Irrigation Consultant or Landscape Architect on backflow devices, valves, sprinklers, wire, pipe and fittings, clamps, to be used on the project prior to purchasing materials. Submittals are subject to the irrigation consultant’s approval.

B. Upon irrigation system acceptance, submit written operating and maintenance instructions. Provide format and contents as directed by the Landscape Architect. Include instruction sheets and parts lists for all operating equipment.

C. Provide a reproducible irrigation system record drawing showing sprinkler heads, valves, field splices, drains and pipelines including quick coupler and valves. Drawing is to be given to the Owner or the Owner’s representative at the final irrigation system walkthrough.

1. Legibly mark drawings to record actual construction.
2. Indicate horizontal locations, with a minimum of two dimensions to permanent surface improvements.
3. Identify field changes of dimension and detail and changes made by Change Order.
1.4 QUALITY ASSURANCE:

A. The Contractor shall maintain continuously a competent superintendent, satisfactory to the Owner, with authority to act for him in all matters pertaining to the work.

B. The Contractor shall coordinate his work with the other trades.

C. The Contractor shall confine his operations to the area to be improved and to the areas allotted him by the Owner's representative for material and equipment storage.

D. The Contractor shall have a minimum of 5 years experience installing irrigation systems of comparable size and complexity.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.

B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends, both threaded or plain.

C. Store and handle materials to prevent damage and deterioration.

D. Provide secure, locked storage for valves, sprinkler heads and similar components that cannot be immediately replaced, to prevent installation delays.

1.6 PROJECT CONDITIONS:

A. The bidder acknowledges that he has examined the site, plans and specifications, and the submission of a proposal shall be considered evidence that examination has been made.

B. It shall be the contracting installer's responsibility to report to the Owner's authorized representative any deviations between drawings, specifications and the site. Failure to do so prior to the installing of equipment and resulting in replacing and/or relocation equipment shall be done at the Contractor's expense.

C. The exact location of all existing utilities and structures and underground utilities are not indicated on the drawings; their locations shall be determined by the Contractor, and he shall conduct his work so as to prevent interruption of service or damage to them. The Contractor shall protect existing structures and utility services and be responsible for their replacement if damaged by him.

D. Minor adjustments in system layout will be permitted to clear existing fixed obstructions. Final system layout shall be acceptable to Landscape Architect.

1.7 CODES AND STANDARDS:

A. The entire installation shall fully comply with all local and state laws and ordinances and with all established codes applicable thereto.

B. Any permits for the installation of construction of the work included under this contract which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the Contractor, each at the proper time. He shall also arrange for and pay all costs in connection with any inspections and examinations required by these authorities.
C. In all cases where inspection of the sprinkler system work is required and/or where portions of the work are specified to be performed under the direction and/or inspection of the Owner's authorized representative, the Contractor shall notify the Owner's authorized representative at least 24 hours in advance of the time and such inspection and/or direction is required.

D. Any necessary re-excavation or alterations to the system needed because of failure of the Contractor to have the required inspections shall be performed at the Contractor's own expense.

1.8 SERVICE AND MAINTENANCE:

A. The Contractor shall service the system at the request during the guarantee period and shall be paid for work performed which is not covered by the guarantee. Contractor shall winterize the system the first year as part of this contract, and will provide written instructions to the Owner for future service and maintenance.

B. Return to the site during the subsequent spring season and demonstrate to the Owner the proper procedures for the system start-up, operation and maintenance.

C. After completion, testing and acceptance of the system, the Contractor will instruct the Owner's personnel in the operation and maintenance of the system.

1.9 OWNER'S ACCEPTANCE:

A. The completion of the contract will be accepted and Notice of Completion recorded only when the entire contract is completed to the satisfaction of the Owner's authorized representative.

B. Within ten (10) days of the Contractor's notification that the installation is complete, the Owner, or his Representative will inspect the installation and if a final acceptance is not given, will prepare a "Punch List" which, upon completion by the Contractor, will signify acceptance by the Owner.

C. Final payment will not be made without the submission of an accurate as-built drawing approved by the Landscape Architect.

1.10 WARRANTY:

A. It shall be the Contractor's responsibility to ensure and guarantee satisfactory operation of the entire system and the workmanship and restoration of the area. The entire system shall be guaranteed to be complete and perfect in every detail for a period of one year from the date of its acceptance and he hereby agrees to repair or replace any such defects occurring within that year, free of expense to the Owner. Minor maintenance and adjustment shall be by Owner.

B. Contractor to guarantee that all trenches and other disturbed areas to be free from heaving or settling more than one-quarter (1/4\textdegree). Should it become necessary to adjust the grade, regrade the trench and reseed. This no-settlement clause shall extend over the entire period of guarantee of the job.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. General:
1. All materials to be incorporated in this system shall be new and without flaws or defect and quality and performance as specified. All material overages at the completion of the installation are the property of the contractor and are to be removed from the site.

2. The Contractor shall use materials as specified. Material other than specified will be permitted only after written application by the Contractor and written approval by the Landscape Architect. Substitutions will only be allowed when in the best interest of the Owner.

B. Pipe and Fittings:

1. Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes will be permitted, but substitutions of larger size may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection.

2. Provide pipe continuously and permanently marked with manufacturer’s name or trademark, size schedule and type of pipe working pressure at 73 degrees F. and National Sanitation Foundation (NSF) approval.

3. All mainline piping and underground piping under continuous pressure plus all pipe 2-1/2” or larger whether a lateral or mainline, shall be rigid, un-plasticized polyvinyl chloride pipe extruded from virgin parent material, ASTM D 2241. Provide pipe homogeneous throughout and free from visible cracks, holes, foreign materials, blisters wrinkles and dents.

4. All mainline piping installed on the rooftop shall be schedule 80 pvc.

5. PVC Pipe installed elsewhere shall be SDR 21, Class 200 unless stated otherwise on the drawing.

6. All PVC Pipe shall be solvent weld type.

7. PVC pipe fittings for sizes 1-1/2” and smaller shall be ASTM D2466 schedule 40 PVC molded fittings suitable for solvent weld. All threaded PVC pipe fittings shall be ASTM D2467, Schedule 80 PVC.

8. Saddle and cross fittings are not permitted. Use male adapters for plastic to metal connections. Hand-tighten male adapters plus one turn with a strap wrench.

9. Sprinkler Zones—All pipe downstream from zone valves, shall be flexible non-toxic polyethylene pipe. Polyethylene pipe shall be PE 3408, ASTM rated at 100 PSI minimum working pressure, and in conformance with ASTM 2239, NSF approved. PE 3408 fittings for polyethylene pipe shall be ASTM D2609 insert type fittings. Saddle and cross fittings not permitted. All joints shall be secured with stainless steel band and screw clamps.

10. Drip Zones— All pipe downstream from zone valves, shall be 1” Schedule 40 PVC.

11. Primer and solvent for use with PVC pipe to conform to ASTM D2564. Primer to be purple in color. Solvent to be appropriate for pipe and fitting type and weather conditions.

12. All above grade pipe (excluding rooftop piping) shall be type ‘M’ copper. Fittings shall be cast brass or wrought copper.

C. Control System:

1. The valves shall be Nibco T113, brass gate valves for manual zone operation.

D. Control Wire (for future conversion):

1. Control wire shall be Type UF, UL approved, for direct burial and shall be Size 14 or larger, as noted on the plans. Conductor to be single strand soft annealed copper.

2. 24 volt control wires to be red in color. Common wire to be white in color.

E. Sprinkler Heads and Valves:
1. Sprinkler equipment shall be as shown on drawings.

F. Clamps:
   1. Clamps to be stainless steel, worm gear hose clamps with stainless steel screw.

G. Valve Boxes:
   1. Valve Access Boxes to be tapered enclosure of rigid plastic material comprised of fibrous components chemically inert and unaffected by moisture corrosion and temperature changes. Provide lid of same material black in color. Boxes to be minimum 10" wide and of minimum size required to permit access to the valve. Side walls to extend at least 2" below the bottom of valve body; use extension as necessary. Manufacturer to be Ametek.

H. Backflow Preventer:
   1. Backflow preventer is to be 1" reduced pressure type with air gap discharge to floor drain.

I. Subsurface Dripperline:
   1. Dripperline shall include check valve, as manufactured by Hunter, Rainbird, Netafim.
   2. All drip tubing installed must be of the same type and of the same manufacturer. Multiple tubing types and manufacturers is not acceptable.
   3. Subsurface irrigation tubing shall be self-flushing, pressure compensating dripperline with internal check valve at each emitter. Dripperline shall consist of nominal sized one-half inch low density, linear polyethylene tubing with internal pressure compensating, continuously self-flushing, integral drip emitters. The emitters shall have the ability to independently regulate discharge rates, with an output pressure of 7 to 70 PSI and shall continuously clean themselves while in operation.
   4. Dripperline shall have emitters spaced 12" o.c. and each emitter shall have .5 - .6 GPH emitter output.
   5. Header pipe for all dripperline shall be schedule 40 PVC, 1" size.
   6. All fittings shall be barbed insert type and be manufactured for use with the subsurface irrigation tubing by the subsurface dripperline manufacturer.
   7. Clamps for barbed fittings shall be pinch-type, stainless steel type.
   8. All associated system equipment including flush valves and drip kits shall be manufactured for use with the subsurface irrigation tubing by Netafim.

J. Accessories:
   1. Drainage fill: 1/2" x 3/4" washed pea gravel.
   2. Fill shall be clean soil free of stones larger than 2" diameter, foreign matter, organic material and debris.
   3. Provide imported fill material as required to complete the work. Obtain rights and pay all costs for imported materials.
   4. Suitable excavated materials removed to accommodate the irrigation system work may be used as fill material subject to the Landscape Architect's review and acceptance.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine final grades and installation conditions. Do not start irrigation system work until unsatisfactory conditions are corrected.
3.2 PREPARATION:

A. Layout and stake the location of each pipe run and all sprinkler heads and sprinkler valves. Obtain Landscape Architect's acceptance of layout prior to excavating, unless specifically waived by the Landscape Architect.

3.3 EXCAVATING AND BACKFILLING:

A. Excavating shall be considered unclassified and shall include all materials encountered, except materials that cannot be excavated by normal mechanical means. Excavate trenches of sufficient depth and width to permit proper handling and installation of pipe and fittings. Excavate to depths required to provide 2" depth of earth fill or sand bedding for piping when rock or other unsuitable bearing material is encountered.

B. Pipe pulling will be allowed for lateral pipe only, provided soil moisture content and other conditions are suitable to allow for full depth of bury with a minimum of stretching and scraping of the pipe. Landscape Architect reserves the right to determine suitability or conditions. If the pulling method is used, the pipe "plow" shall be a vibratory type.

C. Fill to match adjacent grade elevation with approved earth fill material. Place and compact fill in layers not greater than 8" depth.

D. Provide approved fine grained earth fill or sand to point 4" above the top of pipe, where soil conditions are rocky or otherwise objectionable.

E. Fill to within 6" of final grade with approved excavated or borrow fill materials free of lumps or rocks larger than 2" in any dimension.

F. The top 6" of backfill shall be topsoil, free of rocks, subsoil or trash. Any special soil mixture shall be replaced to the original condition it was prior to irrigation installation.

G. Except as indicated, install irrigation mains with a minimum cover of 18" based on finished grades. Install irrigation laterals with a minimum cover of 14" based on finished grades.

H. Excavate trenches and install piping and backfill during the same working day. Do not leave open trenches or partially filled trenches open overnight.

3.4 UNDERGROUND PIPE:

A. Install plastic pipe in accordance with manufacturer's installation instructions as ASTM D-2274. Provide for thermal expansion and contraction.

B. Saw cut plastic pipe. Use a square-in-sawing vice, to ensure a square cut. Remove burrs and shavings at cut ends prior to installation

C. Make PVC plastic to plastic joints with solvent weld joints. Use only primer and solvent recommended by the pipe manufacturer. Install plastic fittings in accordance with pipe manufacturer's instructions and ASTM D2855. Contractor shall make arrangements with pipe manufacturer for all necessary field assistance.

D. Allow joints to set at least 24 hours before pressure is applied to the system.

E. Uncoil poly-pipe and insert fitting full depth. Secure poly-pipe to insert fittings with stainless steel clamps. Double clamp pipe 1-1/2" diameter and larger.
F. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by capping, taping or other acceptable method when pipe installation is not in progress.

G. All mainline and continuously pressurized pipe is to be installed using open trenches. Lateral pipe may be installed by "Plowing" if soil conditions permit, and soils do not contain gravel, rock, construction debris or other potential damaging material.

H. Install thrust blocks on the mainline pipe work in accordance with pipe manufacturer's written instructions.

3.5 SPRINKLER INSTALLATION:

A. Install fittings and sprinkler heads in accordance with manufacturer's instructions, except as otherwise indicated.

B. Set sprinkler heads perpendicular to finished grades, except as otherwise indicated, and position to prevent contact with grounds maintenance equipment. Install sprinklers 6" off walks and curbs. Locate sprinkler heads to assure proper coverage of indicated sprinkler heads to assure proper coverage if indicated areas. Do not exceed sprinkler head spacing distances indicated.

C. Provide pop-up spray heads and rotary sprinklers ¾" IPS or smaller with two elbow poly swing joint riser as shown on drawings.

D. Provide all quick coupling valves with three elbow swing joint, schedule 40 galvanized steel, as detailed on drawings.

3.6 VALVE INSTALLATION:

A. Manual valve installation shall be as indicated on drawings. All sprinkler zone manual valves shall be enclosed in a minimum ten (10) inch width valve box. Add extensions as required to prevent soil settlement around the valve. Set box flush with finish grade and aligned with adjacent boxes and/or adjoining site-work.

B. Install valve access boxes on a suitable base of gravel to provide a level foundation at proper grade and to provide drainage of the access box. Support box with block or notch box to protect pipe under box.

3.7 BACKFLOW PREVENTER:

A. Install new backflow preventer on existing irrigation system line.

3.8 DRIPPERLINE INSTALLATION:

A. Install dripperline in accordance with manufacturers recommended installation procedures.

B. Prepare area for dripline installation by clearing soil surface of debris. Coordinate with landscape contractor to layout dripline in rows between plant material at the spacings determined by the plant material as noted on the landscape plans. Layout drip lines for hedges using one line on both sides of hedge.

C. Stake dripline every 5'-0" to prevent movement using drip tubing manufacturer's hoop stakes as specified for the drip tubing installed on this project.
D. All dripperline shall be installed on grade but below mulch.

E. Install header pipe on drip zones per description on sections 3.4 of these specifications and per the details on the irrigation detail sheet.

F. Each segment of dripperline is to be installed using pressure and exhaust PVC header pipe. “Snaking” of tubing back and forth throughout bed will not be accepted.

G. Install flush valve on every drip zone at furthest point from valve kit.

H. Valves for dripperline zones shall be drip kits complete with valve, pressure regulator and filter as are to be by the same manufacturer as the dripperline. Install inside minimum 11” x 14” sized valve box.

3.9 ELECTRICAL INSTALLATION:

A. Install electrical control wire in the piping trenches wherever possible. Place wire in trench adjacent to or underneath mainlines but not above. Install wire with slack to allow for thermal expansion and contraction. Expansion joints in wire may be provided at 200 foot intervals by making 5-6 turns of the wire around a piece of 1/2" pipe instead of slack. Where necessary to run wire in a separate trench, provide a minimum cover of 24”.

B. Provide minimum 24" slack at manual valves and at all wire splices.

3.10 FLUSHING AND TESTING:

A. After all new sprinkler piping and risers are in place and connected for a given section and all necessary division work has been completed, and prior to the installation of sprinkler heads, all control valves shall be opened and a full head of water used to flush out the system.

B. Sprinkler main shall be tested under normal water pressure for a period of 12 hours. If leaks occur, repair and repeat the test. Give Landscape Architect 24 hours notice prior to testing.

C. Testing of the system shall be performed after completion of each section or completion of the entire installation; and any necessary repairs shall be made, at the Contractor's expense, to put the system in good working order before final payment by the Owner.

D. Adjustment of the sprinkler heads and automatic equipment will be done by the contractor upon completion of installation to provide optimum performance. Minor adjustments during the guarantee period will be made by the owner.

3.11 CLEAN UP:

A. Contractor shall keep the premises free from rubbish and debris at all times and shall arrange his material storage so as not to interfere with the Owner's operation of the job. Contractor shall remove and legally dispose of all unused material, rubbish and debris, including unsuitable excavated material from the site.

END OF SECTION 328400
SECTION 321216 - ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of asphalt concrete paving work is shown on drawings.

B. Related Work Specified Elsewhere:

1. Section 013323: Shop Drawings, Product Data and Samples
2. Section 312000: Earthwork For Site
3. Section 334000: Storm Drainage Facilities

1.3 SUBMITTALS:

A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

1.4 QUALITY ASSURANCE:

A. Comply with standards and specifications where applicable with Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction.

B. Testing and Inspection Service: General Contractor will engage testing and inspection service for quality control testing during paving operation.

1.5 JOB CONDITIONS:

A. Weather Limitation:

1. Apply prime and tack coats only when ambient temperature is above 50 degrees F, and when temperature has not been below 35 degrees F for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

2. Construct asphalt concrete surface course only when atmospheric temperature is above 40 degrees F, and when base is dry. Base course may be placed when air temperature is above 30 degrees F and rising.

B. Grade Control: Establish and maintain required lines and grades, including crown and cross-slope, for each course during construction operations.

C. Traffic Control: Maintain vehicular and pedestrian traffic during paving operations, as required for other construction activities.

1. Provide flagmen, barricades, warning signs, and warning lights for movement of traffic and safety and to cause least interruption of work.
PART 2 - PRODUCTS

2.1 MATERIALS:

A. Aggregate Base: Evenly graded mixture of crushed limestone acceptable to Architect and complying with MDOT 21AA (see drawings).

B. Coarse Aggregate (for bituminous mixtures): Crushed stone or gravel conforming to the following MDOT Specifications:
   1. Base (Leveling) Course: 20AA.
   2. Surface (Wearing) Course: 20AA.

C. Fine Aggregate: Natural or manufactured sand conforming to MDOT Specifications. Use fine aggregate for HMA mixtures consisting of clean, hard, durable, uncoated particles, free from clay lumps, organic materials, soft or flaky materials, and other foreign matter. These aggregates must be natural sand, manufactured fine aggregate, or a uniformly graded blend meeting the grading and physical requirements specified in the contract documents. Sand manufactured from limestone will not be permitted.

D. Mineral Filler: Limestone or dolomite dust, flu ash, conforming to MDOT Specification 3MF.

E. Asphalt Cement: Conform to MDOT Designation (Penetration Grade) 85-100.

F. Prime Coat: Medium curing liquid asphalt conforming to MDOT Designation, MS-OP.

G. Tack (Bond Coat): Rapid curing liquid asphalt conforming to MDOT Designation RC-70; or asphalt emulsion conforming to MDOT Designation SS-1H or MS-2A.

H. Sealer: Coal tar pitch conforming to FSR-P-355e.
   1. Manufacturer:
      a. Advanced Formula J-16 Pavement Sealer

I. Silica Sand: Dry, clean, hard and durable, free of clay, salt and organic matter, graded so that 100% passes a No. 16 sieve, 50-80% passes No. 20 sieve, 30-60% passes a No. 4 sieve, and 0-5% passes a No. 100 sieve.

J. Water: Potable, temperature 50-70 degrees F.

2.2 ASPHALT AGGREGATE MIXTURES:

A. Provide asphalt-aggregate mixtures complying with the following MDOT Designations:
   1. Base (Leveling) Course: MDOT 3C
   2. Surface (Wearing) Course: MDOT 36A

B. Provide course thickness as indicated on drawings.
PART 3 - EXECUTION

3.1 EXAMINATION:

A. Paver must examine areas and conditions under which asphalt concrete paving is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Paver.

3.2 AGGREGATE BASE COURSE:

A. General: Base course consists of placing aggregate base material, in layers of specified thickness, over subgrade surface to support a pavement base course. Proof roll subgrade and verify its acceptability prior to placing base material.

B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Placing: Place base course material on prepared subgrade in two layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting base material during placement operations. Compact to 95% relative density.

3.3 SURFACE PREPARATION:

A. Remove loose material from compacted base surface immediately before applying paving. Use power brooms or blower supplemented by hand brooms or other acceptable means.

B. Proof roll prepared base surface using heavy, rubber-tired rollers to check for unstable areas and areas requiring additional compaction.

C. Prime Coat: Apply at rate of 0.20 to 0.50 gal. per sq. yd. over compacted subgrade. Apply material to penetrate and seal, but not flood surface. Cure and dry as long as necessary to attain penetration and evaporation of volatile.

D. Tack Coat: Apply to contact surfaces of previously constructed bituminous concrete or Portland Cement concrete and similar surfaces. Distribute at the rate of 0.05 to 0.15 gal. per sq. yd. of surface.
   1. Apply tack coat by brush to contact surfaces of curbs, gutters, manholes and other structures projecting into or abutting asphalt concrete pavement.
   2. Allow surfaces to dry until tack coat material is at proper condition of tackiness to receive asphalt concrete mixture.

3.4 FRAME ADJUSTMENTS:

A. Set frames for manholes and other such units, within areas to be paved, to final grade as part of this work. Include existing frames or new frames furnished in other sections of these specifications.

B. Surround frames set to grade with a ring of compacted asphalt concrete base prior to paving. Place asphalt concrete mixture up to 1” below top of frame, slope to grade and compact with hand tamp.
C. Adjust frames as required for paving. Provide temporary closures over openings until completion of rolling operations. Remove closures at completion of the work. Set cover frames to grade, flush with surface of adjacent pavement.

3.5 PREPARING THE MIX:

A. Plant Equipment and Procedures: Comply with all requirements of MDOT.

B. Aggregate Storage: Keep each component of various-sized combined aggregates in separate stockpiles. Maintain stockpiles so that aggregate sizes will not be intermixed and to prevent aggregation.

C. Asphalt Cement Preparation: Heat asphalt cement at mixing plant to a viscosity which can readily be pumped and distributed throughout the asphalt concrete mixture. Add asphalt cement binder to aggregate at a temperature between 235 degrees F and 350 degrees F.

D. Aggregate Preparation: Dry aggregates and deliver to mixer at a temperature between 235 degrees F and 350 degrees F. Maintain the temperature between these limits according to the penetration grade and viscosity characteristics of the asphalt cement, ambient temperature and work-ability of the mixture, while the asphalted cement is being added.

1. Dry aggregates to reduce moisture-content to prevent asphalt concrete mixture from foaming, slumping or segregating during hauling and placing operations.

E. Mixing: Accurately weigh or measure dried aggregates and weigh or meter asphalt cement to comply with job-mix formula requirements. Do not heat asphalt cement above 350 degrees F, at time of introduction into mixer.

1. Mix aggregate and asphalt cement to achieve 90-95% of coated particles for base mixture and 85-90% of coated particles for surface mixture.

F. Delivery: Transport asphalt concrete mixtures from mixing plant to project site in trucks having tight, clean compartment. If required, coat hauling compartment surfaces with a lime-water mixture or a soap or detergent solution to prevent asphalt concrete mixture from sticking. Elevate and drain compartment of excess solution before loading mix.

1. Provide covers over asphalt concrete mixture when delivering to protect mixture from weather and to prevent loss of heat.
2. During periods of cool weather or for long-distance deliveries, provide insulation around entire truck bed surfaces.

3.6 PLACING THE MIX:

A. Field Equipment and Procedures: Comply with all requirements of MDOT.

B. General: Place asphalt concrete mixture on the prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 degrees F. Place inaccessible and small areas by hand. Place each course in required amounts so that when compacted, they will conform to indicated grade, cross-section and thickness.

C. Paver Placing: Unless otherwise directed, begin placing along centerline of areas to be paved on a crowned section and at the high side of sections with a one-way slope and in direction of traffic flow.
1. Place in strips not less than 10' wide, unless otherwise acceptable to Architect. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course materials. Place mixture in as continuous an operation as possible.

D. Hand Placing: Spread, tamp and finish mixture using hand tools in areas where use of machine spreading is not practical. Place mixture at a rate that will ensure proper handling and compaction before mixture becomes cooler than acceptable working temperature.

E. Joints:

1. Carefully make joints between old and new pavements or between successive days work to ensure a continuous bond between adjoining work. Construct joints to have the same texture, density and smoothness as other sections of the asphalt concrete course.
2. Clean contact surfaces of sand, dirt or other objectionable material and apply tack coat.
3. Offset transverse joints in succeeding course not less than 24". Cut back the edge of the previously placed course to expose an even, vertical surface for the full course thickness.
4. Offset longitudinal joints in succeeding courses not less than 6". When the edges of longitudinal joints are irregular, honeycombed or inadequately compacted, cut back all unsatisfactory sections to expose an even, vertical surface for the full course thickness.

F. Protect newly placed material from traffic with barricades or other suitable method until the mixture has cooled and attained its maximum degree of hardness.

3.7 COMPACTING THE MIX:

A. General:

1. Begin rolling operations as soon after placing when mixture will bear weight of roller without excessive displacement. Do not suddenly change line or direction of rolling.
2. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
3. Do not permit heavy equipment, including rollers to stand on finished surface before it has thoroughly cooled or set.

B. Procedures: Start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. Roll to slightly different lengths on alternate runs of rollers. Do not roll center of sections first under any circumstances.

C. Breakdown Rolling:

1. Accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and outside edge. Operate rollers as close as possible to paver without causing displacement.
2. Check crown, grade and smoothness after breakdown rolling. Repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.

D. Second Rolling:

1. Follow breakdown rolling as soon as possible while mixture is hot and in condition for proper compaction.
2. Continue second rolling for at least 3 complete coverages or until mixture has been thoroughly compacted.

E. Finish Rolling: Perform finish rolling while the mixture is still warm enough for removal of roller marks. Continue rolling until all roller marks are eliminated and the course has attained the required density.

F. Patching:
   1. Remove and replace mixtures that become mixed with foreign materials and all defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to the required surface density and smoothness.
   2. Remove deficient areas for the full depth of the course. Cut sides perpendicular and parallel to the direction of traffic with edges vertical. Apply a tack coat before placing asphalt concrete mixture.

G. Protection: After final rolling, do not permit vehicular traffic on the asphalt concrete pavement until it has cooled and hardened and in no case sooner than 6 hours.

3.8 SEALER:
   A. Allow pavement to cure 30 - 45 days. Remove dust and oil to ensure proper adhesion of the sealer to pavement. Persistent dust or oil films that are not removed by mechanical brushing or scrubbing with detergent and water can be sprayed with primer at not more than 0.01 gallons per sq. yd. Detergent must be thoroughly rinsed off before the pavement is sealed.
   B. Uniformly apply first coat of J-16 sand slurry (AFJ-16 with 5 - 6 pounds of sand per gallon) over the entire pavement surface.
   C. Application shall be made with long-handed heavy-duty soft rubber squeegees, plastic bristled brushes, or self-propelled mechanical or spray application equipment especially designed for this purpose.
   D. When first coat has dried sufficiently to accept foot traffic without scuffing, the second coat shall be applied in like manner preferably crosswise, if practical, to the direction of the first coat.
   E. The coating shall be applied at a total application rate of at least 0.18 gallons per square yard based on undiluted sealer and in a minimum of two coats.
   F. Pavement sealer shall not be applied outside when weather is foggy or rainy, or when ambient temperature is below 45 degrees F., nor shall it be applied if such conditions are anticipated during the subsequent eight hours. Allow sealer to cure for 24 hours.

3.9 MINIMUM QUALITY REQUIREMENTS:
   A. General: In addition to other specified conditions, comply with following minimum quality requirements. Test in-place asphalt concrete base and surface courses for compliance with requirements for density, thickness and surface smoothness. Provide final surfaces of uniform texture, conforming to required grades and cross-sections.
   1. Take not less than 3" diameter pavement specimens of each completed course, as specified under Field Quality Control for in-place work, from locations as directed by Architect. Repair holes from test specimens as specified for patching defective work.
B. Density: Compare average density of in-place material against laboratory specimens of same asphalt concrete mixture, when subjected to 50 blows of standard Marshall hammer on each side of the specimen. Minimum acceptable density of in-place course material is as follows:

1. Average density is equal to or greater than 97% and no individual determination is lower than 95% of average density of laboratory specimens.
2. Correlate location of cut-out specimen to be same areas as material from which laboratory specimen was made. Verify from previous recorded data.
3. The finished in-place compacted thickness shall not be less than a total 1/4” variance from the design thickness. Refer to paving details for design thickness.

C. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

1. Base Course: 1/4”, plus or minus
2. Surface Course: 1/4”, plus no minus

D. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with and at right angles to centerline of paved areas. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:

1. Base Course Surface: 1/4”
2. Wearing Course Surface: 3/16”

E. Check surface areas at intervals as directed by Architect.

F. Test crowned surfaces with a crown template, centered and at right angles to crown. Surfaces will not be acceptable if finished crown surfaces vary more than 1/4” from crown template.

G. Pavement adjoining concrete curb and gutter shall meet the edge of metal (the edge of the face of the concrete gutter pan) as follows:

1. For Spill-In gutter pans (where the gutter is lower than the edge of metal), the pavement may be as much as 1/4 inch above the edge of metal, but not less than the edge of metal elevation.
2. For Spill-Out gutter pans (where the gutter is higher than the edge of metal), the pavement may be as much as 1/4 inch below the edge of metal, but not higher than the edge of metal elevation.

3.10 FIELD QUALITY CONTROL:

A. Quality Control During Paving Operations:

1. Allow testing and inspection service to perform sampling and testing of asphalt concrete mixtures for quality control during paving operations. Record locations where samples are taken, to correlate with subsequent testing.
2. Test Uncompacted Asphalt Concrete Mix and Report the Following:

   a. Sampling: AASHTO T 168 (ASTM D-979)
   b. Asphalt Cement Content: AASHTO T 164 (ASTM D-2172)
   c. Mechanical Analysis of Extracted Aggregate: AASHTO T 30
3. Perform six tests for each lot of asphalt mixture placed, unless otherwise specified or directed. A lot will be equal to one day's production.

4. Test Compacted Asphalt Concrete Mix and Report the Following:
   
   a. Bulk Density: AASHTO T 166 (ASTM D-2726)

B. Test in-place, compacted pavement for density and thickness, as herein specified. Perform five tests for each lot of asphalt mixture placed unless otherwise specified or directed.

C. Perform additional testing as may be required if any of previous tests indicate insufficient values or if directed by Architect.

D. Asphalt concrete materials not complying with specified requirements will not be acceptable. Repair or remove and replace defective paving as directed by Architect.
SECTION 321313.13 – EXPOSED AGGREGATE CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:
A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:
A. Extent of exposed aggregate concrete work is shown on drawings.

B. Related Work Specified Elsewhere:
   1. Section 013323: Shop Drawings, Project Data and Samples
   2. Section 079200: Joint Sealants

1.3 SUBMITTALS:
A. Furnish samples, manufacturer’s product data, test reports and materials’ certifications as required in the reference sections for concrete joint fillers and sealers.

B. Provide two (2) sample panels, 2’-0” x 2’-0” for review and approval by Landscape Architect prior to actual installation. Sample panels to consist of 3/16” – 3/8” rounded pea stone aggregate in a light, medium and heavy sandblast finish.

C. Additional sample panel shall be made, if required, to obtain approval.

D. The approved sample panel shall be kept on the job site for comparison with finished work.

1.4 QUALITY CONTROL:
A. Codes and Standards: Comply with local governing regulations if more stringent than herein specified.

B. Concrete Testing Service: Employ, at Contractor’s expense a testing laboratory acceptable to the Architect to perform material evaluation tests and to design concrete mixes.

C. Tests for Concrete Materials:
   1. For Portland Cement, sample cement and determine chemical and physical properties by methods of test of ASTM C-150.
   2. Submit written reports to the Landscape Architect for each material sampled and tested prior to the start of work. Provide the project identification name and number, date of report, name of Contractor, name of concrete testing service, source of concrete aggregates, material manufacturer and brand name for manufacturing materials, values specified in the referenced specification for each material and test results. Indicate whether or not material is acceptable for intended use.
   3. Certificates of material properties and compliance with specified requirements may be submitted in lieu of testing, when acceptable to the Landscape Architect. Certificates of compliance must be signed by the materials’ producer and the Contractor.

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EXPOSED AGGREGATE CONCRETE PAVING 321313.13 - 1
PART 2 - PRODUCTS

2.1 FORM MATERIALS:
   A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
   B. Provide commercial formulation form-coating compounds that will not bond with, stain or adversely affect concrete surfaces.

2.2 REINFORCING MATERIALS:
   A. Reinforcing Bars: ASTM A-615, Grade 60. (Size as shown on drawings.)
   B. Welded Wire Fabric: ASTM A-185 welded steel wire fabric, 6X6W2.9 X W2.9 or size as shown on drawings.

2.3 CONCRETE MATERIALS:
   A. Portland Cement: ASTM C-150, Type I or III.
   B. Aggregate: ASTM C-33. Fines: Clean, natural sand 2NS. Course: Clean crushed stone, gravel or processed (6A), ¾” maximum size.
   C. Seeded Aggregate: Clean, washed, single size, uniform, rounded, free of deleterious material or staining substances, such as iron oxides and iron pyrites. Also free of flat or silver shaped particles. Color, stone size and actual aggregate to be selected by Landscape Architect and Owner from supplied samples. Submit aggregate samples for review.
   D. Water: Clean, fresh, drinkable.
   E. Air-Entraining Admixture: ASTM C-260, 6% - 7%.
   F. Water-Reducing Admixture: ASTM 494, Type A.
   G. Calcium Chloride will not be permitted in concrete, unless otherwise authorized in writing by Landscape Architect.
   H. Preformed joint filler strips shall be nonextruding and resilient nonbituminous type conforming to ASTM D-1752, Type I or II, 1/2 inch thick.
   I. Joint sealant shall be two-component, self-leveling polyurethane electrometric compound, as specified in Section 079200 – Joint Sealants.
   J. Sealer: Proteck 'Weather Guard' (1-800-99-BRICK).

2.4 PROPORTIONING AND DESIGN OF MIXES:
   A. Prepare design mixes in accordance with applicable provisions of ASTM C-94.

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1. Design Mix: 3500-4000 PSI, 28 day compressive strength with 6% - 7% air entrainment, maximum ¾” diameter aggregate and maximum 4’ slump.
2. Design mix shall contain a minimum of 570 lbs. of Portland Cement per cubic yard and have a water cement ratio no greater than 0.53.
3. Use admixtures for water-reducing and set-control in strict compliance with the manufacturer’s directions.
4. Use amounts of admixtures as recommended by the manufacturer for climate conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

PART 3 - EXECUTION

3.1 EXAMINATION:
A. Examine the areas and conditions under which concrete curbs and paving are to be installed and notify the Landscape Architect in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 SURFACE PREPARATION:
A. Remove loose material from the compacted subbase surface immediately before placing concrete.
B. Proof-roll prepared subbase surface to check for unstable areas and the need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
C. General: Control soil compaction during construction to provide the percentage of density specified for each area classification.
D. Percentage of Maximum Density Requirements: Compact soil to not less than following percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship determined in accordance with ASTM D-1557; and not less than following percentages of relative density, determined in accordance with ASTM D-2049, for soils which will not exhibit well-defined moisture-density relationship.
   1. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material at 90% maximum density for cohesive soil or 95% relative density for cohesionless material.
E. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or to layer of soil material. Apply water in such manner as to prevent free water from appearing on surface during or subsequent to compaction operations.
   1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
   2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to satisfactory value.
3.3 FORM CONSTRUCTION:

A. Set forms to the required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of the work and so that forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork for grade and alignment to the following tolerances:
   1. Top of forms not more than 1/8" in 10'.
   2. Vertical face on longitudinal axis, not more than 1/4" in 10'.

C. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

3.4 PLACING CONCRETE:

A. Concrete shall not be placed until subgrade and forms have been approved for line and grade.

B. Place concrete in one course, monolithic construction and consolidate by vibrator tamping along the face of the forms and at joints, to remove all voids and honeycomb.

C. Finishing operations shall not begin until surface water has disappeared or is removed in an approved manner. Applying dry cement as an absorptive material will not be permitted.

D. Retempered concrete or concrete which has partially hardened shall not be deposited.

E. Exposed, newly placed concrete shall be protected from rain, sleet or hail by the use of adequate coverings.

F. Do not allow the free fall of concrete to exceed 3 feet. Concrete shall be placed in accordance with ACI Standard 614, “Recommended Practice for Measuring, Mixing and Placing Concrete”.

G. Concrete shall be consolidated by suitable means to eliminate voids and pockets.

H. Cold or hot weather procedures shall be followed as required by ACI Standard Specifications 604 and 605, respectively.

I. The strike-off and screening operation shall be such that a level surface is obtained sufficiently below the final finish grade to allow for volume change due to the addition of the select aggregate and the finished exposed aggregate surface to be at finish grade.

3.5 AGGREGATE PREPARATION:

A. Prior to placing operation, all select aggregate that is to be exposed shall be washed thoroughly so that it is free of all dust, dirt, and clay particles. The aggregate shall be in a damp drained condition when it is placed on the surface of the slab. There must be sufficient select aggregate on hand to complete the job once it is started.

3.6 AGGREGATE SEEDING AND EMBEDMENT:

A. Immediately after screening and bull floating the base slab, sprinkle the aggregate by hand or shovel onto the slab surface until the surface is completely covered with a single layer of stone. Place aggregate as close together as possible to ensure a uniform appearance.
B. After evenly distributing the aggregate, tamp it into the fresh concrete with a wood float, darby, or straightedge. For final embedment, float the surface with a bull float or darby until mortar slightly covers all aggregate particles to about a 1/16 inch depth.

C. Continue floating until the moisture on the entire slab surface is uniform and there are no water pockets.

D. After aggregate embedment, the slab surface should look like freshly floated concrete and have no voids or imperfections.

E. When a surface retarder is used, aggregate exposure can be delayed for several hours. Because high temperatures increase the rate of concrete hardening, a surface retarder can also be useful in hot weather. After applying a retarder to the slab, keep the surface damp by covering it with plastic sheeting.

3.7 EXPOSING THE AGGREGATE:

A. Timing of aggregate exposure is critical. Wait until a foot placed on the slab surface does not leave an indentation, then lightly brush a small area of the slab with a medium to stiff nylon bristle broom to remove excess mortar. If aggregate dislodges easily, delay the operation.

B. Begin the exposure process by brushing the entire slab surface lightly with a broom to remove excess mortar. Next, brush the surface again then flush it with a fine spray of water from a hose or use a special broom with built-in water jets.

C. A common mistake is to flush the surface too early. Wait until the concrete is hard enough to retain the embedded aggregate and the mortar is still soft enough to be removed. Keep the surface damp at all times.

D. Continue brushing and spraying until the aggregate is exposed to the proper depth and the flush water runs clear. Don’t remove too much mortar from around the aggregate or it may dislodge in service. Generally, depth of exposure should not exceed one-third the aggregate diameter.

E. During and immediately after the exposing operation, finishers should avoid walking or kneeling on the slab surface because they might break the aggregate bond. If working on the slab, use knee boards, taking care not to slide or twist them as they move about.

3.8 CURING:

A. As soon as the washing operation ceases, the curing operation shall begin. The concrete shall be kept in a continuously wet condition by covering and continuous saturation or by ponding for 7 days when the temperature is between 50 degrees and 70 degrees F., and at least 5 days when the temperature is 70 degrees F. or higher.

3.9 ACID WASH:

A. After the slab is cured and no longer than two weeks after the concrete has been replaced, cement film shall be removed from the surface of the aggregate by an acid wash. Delaying the acid wash additional time is permissible, in fact, desirable. The slab shall be saturated with water, brushed free of standing water, and washed with a 5 to 10 percent solution of muriatic acid. Several flashings with clear water should follow the acid wash. The above procedure shall be followed until the surface matches the approved sample panel.

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B. Protective Sealer Finish: Apply protective sealer finish to concrete curbs and paving under building. Apply in accordance with manufacturer’s printed instructions at rates not less than those specified herein.

3.10 REPAIRS AND PROTECTIONS:

A. Repair or replace broken or defective concrete as directed by the Architect.

B. Drill test cores where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland Cement bonded to pavement with epoxy resin grout.

C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

END OF SECTION 321313.13
SECTION 323119 – STEEL ORNAMENTAL PICKET FENCING AND GATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Steel ornamental picket fencing and gates

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:
   1. Section 013323: Shop Drawings, Product Data and Samples.
   2. Section 3213213.13: Exposed Aggregate Concrete Paving

1.3 DESCRIPTION OF WORK

A. The contractor shall provide all labor, material and equipment necessary for and incidental to proper completion of all fencing and gate installations. Location and extent of fencing and gates are as shown on drawings.

1.4 SUBMITTALS

A. Shop drawing of fences and gates with all dimensions, details, and finishes. Drawings must include post foundations.

B. Product data: Manufacturer's certification indicating materials compliance that all conditions of the specifications have been met.

C. Hinges, latches and hardware connections.

D. Manufacturers of fencing systems differing from the specifications herein shall be submitted to the Landscape Architect 10 days prior to bid for consideration as a substitution. Failure to submit substitution request will result in possible rejection of bid.

1.5 QUALITY ASSURANCE

A. Provide manufacturer's standard limited warranty that its ornamental fence system (rails, pickets and posts) are free from defects in material and workmanship including cracking, peeling, blistering and corroding for a period of 20 years from the date of purchase.

B. Fabrication and installation: Fabricator and installer shall be a subcontractor with not less than five (5) years of successful experience in the required types of fabrication and installation procedures.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials with manufacturer's tags and labels intact.

B. Handle and store so as to avoid damage.

C. All equipment parts and materials shall be new.
1.7 WARRANTY

A. All material and workmanship guaranteed against defect for one (1) year from time of final acceptance. Contractor to remedy any unsatisfactory conditions during guarantee period at no cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of design: The fence system shall conform to Montage® standard picket space. Welded and Rackable (ATF – All Terrain Flexibility) Ornamental Steel, (for standard picket space, specify Majestic™ design, 2-Rail style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

B. Picket fences and gates must be obtained from a single source.

C. Fence shall have butterfly scroll adornments model #HB058 (color to match fence panel). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

D. Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

2.2 ORNAMENTAL PICKET FENCE

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft² (184 g/m²), Coating Designation G-60.

B. Material for pickets shall be 5/8” square x 18 Ga. tubing. The rails shall be steel channel, 1.25” x 0.92” x 14 Ga. Picket holes in the rail shall be spaced 4.334” o.c. for standard picket space. Fence posts shall be a minimum of 2” square x 16 Ga, or as noted on details. Gate posts shall meet the minimum requirements of Table 1.

C. Height: 5’ nominal, refer to drawings for special conditions.

D. Fence posts shall receive (1) ball cap finial on each post. Ball cap finial shall be Model #HB508R (color to match fence). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

2.3 ORNAMENTAL GATES

A. Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-1/4” square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

B. Gate hinges shall be commercial adjustable 180° hinge, model #MCH180R (color to match gate panel). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.
C. Gate shall include 24” Q-Bold drop rod model # QB124 (color to match gate panel). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

D. Gate shall include strong arm double gate latch model #DSB200 (color to match gate panel). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

E. Gate shall include butterfly scroll adornments model #HB058 (color to match gate panel). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

F. Gate posts shall receive (1) ball cap finial on each post. Ball cap finial shall be Model #HB508R (color to match fence). Approved Manufacturer: Ameristar Fence Products, 1555 N. Mingo, Tulsa, OK. 74116, Phone: (888) 333-3422, www.ameristarfence.com or approved equal.

2.4 FABRICATION
A. Gates, pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar’s proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel).

C. The manufactured panels and posts shall be subjected to an inline electrode position coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be Black. The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

2.5 SETTING MATERIALS
A. Concrete: Minimum 28 day compressive strength of 3,000 psi (20 Mpa).

PART 3 - EXECUTION
3.1 EXAMINATION
A. Verify areas to receive fencing and gates are completed to final grades and elevations.

B. Property lines and legal boundaries of work to be clearly established by the general contractor.
3.2 FENCE INSTALLATION

A. Fence post shall be spaced according to Table 3, plus or minus ½”. For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer.

3.3 FENCE INSTALLATION MAINTENANCE

A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufacturers’ warranty.

3.4 GATE INSTALLATION

A. Gate posts shall be spaced according to the manufacturers’ gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers’ gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacturer of the gate and shall be installed per manufacturer’s recommendations.

3.5 CLEANING

A. Clean up debris and remove from the site.

Table 1 – Minimum Sizes for Montage Gate Post

<table>
<thead>
<tr>
<th>Gate Opening</th>
<th>Gate Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up To &amp; Including 4’</td>
</tr>
<tr>
<td></td>
<td>Over 4’, Up To &amp; Including 6’</td>
</tr>
<tr>
<td>Up To &amp; Including 4’</td>
<td>2” x 16 Ga.</td>
</tr>
<tr>
<td>Over 4’, Up To &amp; Including 6’</td>
<td>2-1/2” x 16 Ga.</td>
</tr>
</tbody>
</table>

Table 2 – Coating Performance Requirements

<table>
<thead>
<tr>
<th>Quality Characteristics</th>
<th>ASTM Test Method</th>
<th>Performance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesion</td>
<td>D3359 – Method B</td>
<td>Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).</td>
</tr>
</tbody>
</table>
Corrosion Resistance | B117, D714 & D1654 | Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is accumulation of 1/8” coating loss from scribe or medium #8 blisters).
Impact Resistance | D2794 | Impact Resistance over 60 inch lb. (Forward impact using 0.625” ball).
Weathering Resistance | D822, D2244, D523 (60° Method) | Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Montage - Post Spacing By Bracket Type

<table>
<thead>
<tr>
<th>Span For CLASSIC, GENESIS, MAJESTIC, WARRIOR, CRESCENT, GEMINI 8’ Nominal (94” Rail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Size</td>
</tr>
<tr>
<td>Bracket Type</td>
</tr>
<tr>
<td>Post Settings ± ½” O.C.</td>
</tr>
</tbody>
</table>

* Note: When using BB106 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.

END OF SECTION 323119
SECTION 329119 - TOPSOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of Topsoil Work is shown on drawings and by provisions of this Section.

B. Topsoil for lawn work shall be as stripped from site or provided by Contractor from off-site sources free of herbicides.

C. Related Work Specified Elsewhere:

1. Section 329223: Sodding
2. Section 329300: Plants

1.3 QUALITY ASSURANCE:

A. Testing and Inspection: For supplied and/or stockpiled topsoil. Performed by a qualified independent testing laboratory, under the supervision of a Registered Professional Engineer, specializing in soils engineering. Obtain samples of stockpiled topsoil before completely stripping from the interior of stockpile.

B. Provide and pay for testing and inspection during topsoil operations. Laboratory shall be acceptable to the Landscape Architect.

1. Recommended Testing Laboratory:
   A & L Great Lakes Laboratories, Inc.
   3505 Conestoga Drive
   Fort Wayne, IN 46808
   P: (260) 483-4759
   F: (260) 483-5274
   www.algreatlakes.com

C. Test representative material samples for proposed use.

D. Tests shall include:

1. pH factor
2. Lime requirement
3. Mechanical analysis (P.K. Ca. mg) and cation ratios
4. Percentage of organic content and loss by ignition
5. Soil series classification
6. Clay content
7. Herbicide multi-residue test (MR-1)
E. Provide soil lab recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting and soil lab recommendations regarding residue test results.

F. Submit test reports.

1.4 PROJECT CONDITIONS:

A. Known underground and surface utility lines are indicated on the civil drawings.

B. Protect existing trees, plants, lawns and other features designated to remain as part of the landscaping work.

C. Promptly repair damage to adjacent facilities caused by topsoil operations. Cost of repair at Contractor's expense.

D. Promptly notify the Landscape Architect of unexpected sub-surface conditions.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Topsoil: Supplied topsoil proposed for use must meet testing criteria results specified and conform to adjustments as recommended by soil test and Landscape Architect.

B. Provide screened topsoil as required to complete the job. Topsoil must meet testing criteria results specified. All processing, cleaning and preparation of this topsoil to render it acceptable for use is the responsibility of this Contractor.

C. Supplied topsoil shall be screened, fertile, friable and representative of local productive soil, capable of sustaining vigorous plant growth and screened free of clay lumps, subsoil, noxious weeds or other foreign matter such as stones greater than 1" in diameter in any dimension, roots, sticks and other extraneous materials: not frozen or muddy. pH of existing or supplied soil to range between 5.0 and 7.5. Adjusted to not more than 7.0 by additives as required by soil test. Topsoil shall contain not less than 3% and not greater than 10% organic matter. Clay content as determined by Bouyoucous Hydrometer Test shall range between 5 and 15 percent.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine rough grades and installation conditions. Do not start topsoil work until unsatisfactory conditions are corrected.

3.2 FINISH GRADING:

A. Perform topsoiling within contract limits, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide uniform levels and slopes between new elevations and existing grades.

B. Grade surfaces to assure areas drain away from building structures and to prevent ponding and pockets of surface drainage.
C. Lawn Areas: Supply and spread topsoil to a minimum uniform depth of 4" or as noted. Remove clumps larger than 1" in diameter.

D. Grade lawn areas to a smooth, free draining even surface with a loose, moderately coarse texture ready to accept seed or sod.

E. For trees, shrubs, ground cover beds and backfill for beds see Section 329300 – Plants.

F. Provide earth crowning where indicated on drawings.

G. Crowning/mounding to be free flowing in shape and design, as indicated, and to blend into existing grades gradually so that toe of slope is not readily visible. Landscape Architect to verify final contouring before planting.

H. Regardless of finish grading elevations indicated, it is intended that grading be such that proper drainage of surface water will occur and that no low areas are created to allow ponding. Contractor to consult with Owner or Landscape Architect regarding minor variations in grade elevations before rough grading is completed.

3.3 CLEANING:

A. Upon completion of topsoiling operations, clean areas within contract limits, remove tools and equipment. Site shall be clear, clean, free of debris and suitable for site work operations.

END OF SECTION 329119
SECTION 329223 – SODDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:
   A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:
   A. Extent of sodded lawns is shown on drawings and by provisions of this Section.
   B. Type of Work Required Includes the Following:
      1. Soil preparation
      2. Sodding lawns
   C. Related Work Specified Elsewhere:
      1. Section 320536: Landscape Maintenance and Warranty Standards
      2. Section 328400: Irrigation System (Performance)
      3. Section 329119: Topsoil
      4. Section 329300: Plants

1.3 SUBMITTALS:
   A. Submit sod grower’s certification of grass species including special shade grown species. Identify source location.
   B. Manufacturer’s certification of fertilizer.

1.4 QUALITY ASSURANCE:
   A. Sod: Comply with American Sod Producers Association (ASPA) classes of sod materials.

1.5 DELIVERY, STORAGE AND HANDLING:
   A. Cut, deliver and install sod within 24-hour period.
   B. Do not harvest or transport sod when moisture content may adversely affect sod survival.
   C. Protect sod from sun, wind and dehydration prior to installation. Do not tear, stretch or drop sod during handling and installation.

1.6 PROJECT CONDITIONS:
   A. Work Notifications: Notify Landscape Architect at least 7 working days prior to start of sodding operation.
   B. Protect existing utilities, paving and other facilities from damage caused by sodding operations.
C. Perform sodding work only after planting and other work affecting ground surface has been completed.

D. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.

E. Provide hose and lawn watering equipment as required.

F. An irrigation system will be installed prior to sodding. Locate, protect and maintain the irrigation system during sodding operations. Repair irrigation system components damaged during sodding operations at this Contractor's expense.

1.7 WARRANTY:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Sod: An "approved" nursery grown blend of improved Kentucky Blue-grass varieties.
   1. Sod containing Common Bermudagrass, Quackgrass, Johnsongrass, Poison Ivy, Nutsedge, Nimblewill, Canada Thistle, Timothy, Bentgrass, Wild Garlic, Ground Ivy, Perennial Sorrel or Brome grass weeds will not be acceptable.

B. Provide well-rooted, healthy sandy-loam topsoil grown sod, (submit grower and soil analysis for review). Sod shall be free of diseases, nematodes and soil borne insects. Peat grown sod is not acceptable. Provide sod uniform in color, leaf texture, density and free of weeds, undesirable grasses, stones, roots, thatch and extraneous material; viable and capable of growth and development when planted.

C. Furnish sod machine stripped in square pads or strips not more than 3'-0" long; uniformly 1" to 1-1/2" thick with clean-cut edges. Mow sod before stripping.

D. Fertilizer: Use a 1-2-1 NPK ratio SGN 100-210 starter fertilizer that is non injurious to turf with a sustained release of nitrogen to provide 10-16 weeks of fertility. Phosphorus and potassium amendments shall be industry standard. If soil test results show adequate phosphorus and potassium then NPK ratio shall be amended to 3-0-2. Lower rate to .1 lb N per week release, (see 3.2, F for application rates).

E. Ground Limestone: Containing not less than 85% of total carbonates and ground to such fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve. Use if determined by soil tests to be necessary.

F. Stakes: Softwood, 3/4" x 8" long.

G. Water: Free of substance harmful to sod growth. Hoses or other methods of transportation furnished by Contractor.

H. Topsoil: Refer to Section 329119 – Topsoil.
PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine finish surfaces, grades, topsoil quality and depth. Do not start sodding work until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Limit preparation to areas which will be immediately sodded. Spread topsoil, fine grade.

B. Treat lawn areas with "Round Up" by Monsanto, per label directions as required to kill existing vegetation prior to sodding.

C. Loosen topsoil of lawn areas to minimum depth of 3". Remove stones over 1" in any dimension and sticks, roots, rubbish and extraneous matter. (In athletic fields remove stones over 1/2" in any dimension. Refer to Section 329119 – Topsoil.)

D. Grade lawn areas to smooth, free draining and even surface with a loose, and uniformly fine texture. Roll and rake; remove ridges and fill depressions as required to drain.

E. Apply amendments as indicated by soil test, with rotary or drop spreader and incorporate in top 3 inches of soil. Soil test results must be forwarded to landscape architect.

F. Apply starter fertilizer at a rate to provide sustained fertility of .15 - .2 lbs. N per 1000 sf per week for 10-16 weeks. Available manufacturer (Polyon) or approved equal. Starter fertilizer may be part of phosphorus and potassium needs as indicated by soil test.

G. Dampen dry soil prior to sodding.

H. Restore prepared area to specified condition if eroded, settled or otherwise disturbed after fine grading and prior to sodding.

3.3 INSTALLATION:

A. Lay sod to form a solid mass with tightly-fitted joints. Butt ends and sides of sod strips. Do not overlay edges. Stagger strips to offset joints in adjacent course. Remove excess sod to avoid smothering of adjacent grass. Provide sod pad top flush with adjacent curbs, sidewalks, drains and seeded areas.

B. Do not lay dormant sod or install sod on saturated or frozen soil.

C. Install initial row of sod in a straight line, beginning at bottom of slopes, perpendicular to direction of the sloped area. Place subsequent rows parallel to and lightly against previously installed row.

D. Peg sod on slopes greater than 3 to 1 to prevent slippage at a rate of 2 stakes per yard of sod.

E. Water sod thoroughly with a fine spray immediately after laying.

F. Roll with light lawn roller to ensure contact with sub-grade.
G. Sod indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.

3.4 MAINTENANCE:
A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

3.5 ACCEPTANCE:
A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

3.6 CLEANING:
A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris and equipment. Repair damage resulting from sodding operations.

END OF SECTION 329223
SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of trees, shrubs and ground covers is shown on drawing and by provisions of this Section.

B. Type of Work Required Includes the Following:

1. Soil preparation
2. Trees, shrubs and ground covers
3. Planting mixes
4. Mulch and planting accessories
5. Soil percolation tests

C. Related Work Specified Elsewhere:

1. Section 320536: Landscape Maintenance and Warranty Standards
2. Section 328400: Irrigation System (Performance)
3. Section 329119: Topsoil
4. Section 329223: Sodding

1.3 SUBMITTALS:

A. Submit the Following Material Samples:

1. Shredded bark mulch.
2. Trees must be approved by 1 of 2 options at the discretion of the Landscape Architect:
   a. Landscape Architect field tag.
   b. Photographs of representative material. Trees not meeting the quality of approved representative sample will be rejected.
3. One (1) gallon bag of plant mixture with approved topsoil compost blend.

B. Submit the Following Materials Certification:

1. Topsoil source and test report.
2. Plant fertilizer.
3. Compost test results.

1.4 QUALITY ASSURANCE:

A. Plant names indicated; comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.
B. Comply with sizing and grading standards of the latest edition of “American Standard for Nursery Stock.” A plant shall be dimensioned as it stands in its natural position.

C. All plants shall come from nurseries located in Zones 4 - 6 of the USDA Hardiness Zone Map unless approved by the Landscape Architect.

D. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.

E. Provide percolation testing by filling plant pits with water and monitoring length of time for water to completely percolate into soil. Submit test results to Landscape Architect prior to starting work.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver fertilizer materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in manner to prevent wetting and deterioration.

B. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Spray deciduous plants in foliage with an approved “Anti-Dessicant” immediately after digging to prevent dehydration. Dig, pack, transport and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival. A copy of certificate shall be filed with the Landscape Architect. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss or in a manner acceptable to the Landscape Architect. Water heeled-in plantings as required to keep root system moist until planting. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

C. Cover plants transported on open vehicles with a protective covering to prevent windburn.

D. Frozen or muddy topsoil is not acceptable.

1.6 PROJECT CONDITIONS:

A. Work Notification: Notify Architect at least 7 working days prior to installation of plant material.

B. Protect existing utilities, paving and other facilities from damage caused by landscaping operations. See AIA General Conditions.

C. A complete list of plants, including a schedule of sizes, quantities and other requirements is shown on the proposal form. In the event that quantity discrepancies or material omissions occur in the proposal form, Contractor shall notify the Landscape Architect during the proposal bidding process.

D. Locate, protect and maintain the existing irrigation system main lines during construction. Repair irrigation system components, damaged during planting operations, at this Contractor’s expense.

E. Perform percolation testing.

F. Verify availability of on-site water.
G. Concealed contingencies. Refer to AIA General Conditions.

1.7 WARRANTY:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Plants - General: Provide plants typical of their species or variety; with densely developed branches and vigorous, fibrous root systems free of insects and diseases and have a fully developed form without voids and open spaces. Plants shall be lush, without dry foliage or root balls, free of defects, disfiguring knots, sunscald, wind burn, broken branches, frost cracks or abrasions.

   1. Balled and burlapped plants shall have natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the "American Standard for Nursery Stock".
   2. Cracked or mushroomed balls will not be accepted.
   3. Sandy loam or sandy balls will not be accepted.
   4. Plants planted in rows shall be matched in form, size, height and branching habit.
   5. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
   6. No pruning wounds shall be present with a diameter of more than 1” and such wounds must show vigorous bark on all edges.
   7. Shrubs and small plants shall meet the requirements for spread and height indicated on the proposal form.

B. All single trunk deciduous trees (including specimen stock), shade or ornamental trees, shall have straight trunks of healthy condition without mechanical damage, splits, frost cracks, scars, free of insects or disease.

   1. Trees must have a straight central leader through crown of tree.
   2. “V” crotch branching will not be accepted.
   3. Tree crown to be uniform, symmetrical, plumb and characteristic of species.

C. All Evergreen trees (including specimen stock) shall have straight trunks of healthy condition without mechanical damage, splits, frost cracks, scars, free of insects or disease.

   1. Trees must have a straight central leader from base to top of tree.
   2. “V” crotch branching will not be accepted.
   3. Trees to be uniform, symmetrical and plumb.
   4. Trees must be unsheared and fully branched to ground.

D. Provide "specimen" plants with a special height, shape or character of growth. Landscape Contractor to tag specimen trees or shrubs at the source of supply. The Landscape Architect will inspect specimen selections at the source of supply for suitability and adaptability to selected location. When specimen plants cannot be purchased locally, provide sufficient photographs of the proposed specimen plants for approval. The Landscape Contractor shall
inspect all plant material at source prior to Landscape Architect's review. Landscape Contractor shall accompany Landscape Architect to nursery on final selection trip (if required).

E. Container-Grown Stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.

1. No plants shall be loose in the container.
2. Container stock shall not be root bound.
3. The measurements for height shall be taken from the ground level to the average height of the top of the plant and not the longest branch.
4. Single stemmed or thin plants will not be accepted.
5. Side branches shall be generous, well twigged and the plant as a whole well bushed to the ground.
6. Plants shall be in a moist, vigorous condition, free from dead wood, bruises or other root or branch injuries.

F. Specimen Stock: All specimen designated plantings are to be nursery grown, fully developed, excellent quality and typical example of the species. Plants designated to be planted in rows must be matched, symmetrical and uniform in height, spread, caliper and branching density.

1. Matched plantings should be obtained from same nursery and, preferably, from same row or line. All specimen material will be approved by Landscape Architect at nursery.

G. Topsoil for Planting Mix: Refer to Section 329119 - Topsoil.

H. Peat Moss: Brown to black in color, weed and seed free granulated raw peat.

1. Provide ASTM D-2607 sphagnum peat moss with a PH below 6.0 for ericaceous plants.

I. Planting Mixture Type A (for shrubs and ornamental grasses): Standard planting backfill shall be a mixture of 3/4 topsoil, 1/4 compost. Add fertilizer Type "A" or as indicated by soil test to planting mixture per manufacturer's requirements. Follow planting details.

J. Planting Mixture Type B (for perennials, ground cover beds and Ericaceous plants): Planting backfill shall be a mixture of 3/4 topsoil, 1/4 compost. Adding fertilizer type "B" or as indicated by soil test to mixture per manufacturer requirements. Follow planting details.

K. Plant Fertilizer shall be:

1. Legal and acceptable in the local community of the project and shall not be harmful to the public or wildlife when applied per manufacturer's instructions.
2. Slow-release, SCU or IBDU fertilizers for turf, flowerbeds, and deep-root feeding shall be used unless approved otherwise.
3. Turf, shrub, or tree fertilizer used shall contain low or no phosphate unless soil tests indicate soil is deficient in this nutrient.

Fertilizer Type A with micronutrients to be applied at a NPK ratio of 4-1-2. Provide 1 lb of actual nitrogen per 1,000 sf unless the soil test recommendations indicate otherwise.

Fertilizer Type B with micronutrients to be applied at a NPK ratio of 1-2-1. Provide 2 lbs of actual nitrogen per 1,000 sf unless the soil recommendations indicate otherwise.

L. "MyCor" Tree Saver Soil Conditioner manufactured by Plant Health Care, Inc., (800) 421-9051. Use for all tree and shrub species except Rhododendrons, Azaleas and Laurels.
M. Superphosphate: Composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than eighteen (18%) percent available phosphoric acid. Apply as required based upon soil test report.

N. Compost: The compost shall be a mature/stabilized, humus-like material derived from the aerobic decomposition of yard clippings or other materials as designated compostable as defined in Part 115 of Act 451 of 1994 as amended in Act 212 dated 2007, and shall be in compliance with all federal and state laws. The compost shall have a dark brown or black color, be capable of supporting plant growth without ongoing addition of fertilizers or other soil amendments and shall not have an objectionable odor. It shall be free of plastic, glass, metal and other physical contaminants, as well as viable weed seeds and other plant parts capable of reproducing (except airborne weed species). The compost moisture content shall be such that no visible free water or dust is produced when handling it.

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Acceptable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity/Stabilization:</td>
<td>An acceptable test that can demonstrate Maturity/Stability</td>
</tr>
<tr>
<td>Temperature:</td>
<td>The material must have undergone the procedure to significantly reduce the pathogen level as referenced in EPA 40 CFR, Part 257 Regulations, Federal Register Vol. 58, No. 32; dated 2/19/93; Rules and Regulations; (Pile temperatures must be maintained at 40 degrees C for 5 days with a temperature exceeding 55 degrees C for at least 4 hours).</td>
</tr>
<tr>
<td>Pathogens and Trace:</td>
<td>Shall meet the requirements of EPA 40 CFR, Part 503 *TCLP or Elements EPA 1311 Regulations, Federal Register Vol. 58, No. 32; dated 2/19/93; Rules and Regulations.</td>
</tr>
<tr>
<td>Organic Content:</td>
<td>30-65%, dry weight basis</td>
</tr>
<tr>
<td>Moisture Content:</td>
<td>30-60%, wet weight basis</td>
</tr>
<tr>
<td>Inert Contamination:</td>
<td>Less than 1% by weight (no visible plastic, glass or metal allowed)</td>
</tr>
<tr>
<td>Soluble Salts:</td>
<td>1 – 7.5 mmho</td>
</tr>
<tr>
<td>Carbon:Nitrogen Ratio:</td>
<td>10:1 to 20:1</td>
</tr>
<tr>
<td>pH:</td>
<td>6 to 7.5</td>
</tr>
<tr>
<td>Particle Size:</td>
<td>98% pass through 3/4” screen or smaller</td>
</tr>
</tbody>
</table>

A compost sample shall be submitted to the Owner for approval prior to being used.

O. Lime: Ground dolomitic limestone, ninety-five (95%) percent passing through #100 mesh screen. Use to adjust soil pH only, under direction of Landscape Architect or based upon soil test report.

P. Sand: Clean, coarse, ungraded conforming to ASTM C-3 for fine aggregates.
Q. Anti-Dessicant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.

R. Double Processed Shredded Bark Mulch: Dark brown in color, clean, free of debris and sticks, and well aerated. Materials shall be uniform in size, shape and texture. Recycled wood products, such as "pallet mulch," shall not be used. Submit samples for approval prior to installation.

S. Water: Free of substances harmful to plant growth. Hoses or other methods of transportation furnished by Contractor.

T. Stakes for Staking: Hardwood or green metal T-section posts without anchor plates, 2" x 2" x 6'-0" minimum length.

U. Stakes for Guying: Hardwood, 2 x 4 nominal, x 24" length, pointed on one end.

V. Guying/Staking Wire: New galvanized steel wire, free of kinks or bends, use 11 gauge for trees 4” caliper or 8’ height and under; use 9 gauge for larger trees.

W. Turnbuckles: Galvanized steel of size and gauge required to provide tensile strength equal to that of the wire. Turnbuckle opening shall be at least 3”.

X. Staking and Guying Hose: Two-ply, 3/4” black reinforced garden hose not less than 1/2” inside diameter.

Y. Tree Wrap: Standard waterproofed tree wrapping paper, 2-1/2” wide, made of 2 layers of crepe kraft paper weighing not less than 30 lbs. per ream, cemented together with asphalt.

Z. Twine: Two-ply jute material.

AA. Steel Edge Restraints: Painted steel edging (3/16 inch (4.8 mm) thick by 4 inches (100 mm) high), with loops pressed from or welded to face to receive stakes at 36 inches (900 mm) o.c., and steel stakes 15 inches (380 mm) long for each loop.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
   b. Collier Metal Specialties, Inc.
   c. J. D. Russell Company (The).
   d. Ryerson, J. T. & Son, Inc.
   e. Sure-Loc Edging Corporation
3. Color: Black
4. Install per manufacturer's recommendations. Top to be flush with finish grade, alignment per drawings. All edging to be new.
PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine proposed planting areas and conditions of installation. Do not start planting work until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Time of Planting:

1. Evergreen Material: Plant evergreen materials between August 15 and October 1 or in spring before new growth begins. If project requirements require planting at other times, plants shall be sprayed with anti-dessicant prior to planting operations.
2. Deciduous Material: Dig deciduous materials in a dormant condition. If deciduous trees are dug in-leaf, they shall be sprayed with an anti-dessicant prior to planting operation.
3. Planting times other than those indicated must be acceptable to the Landscape Architect.

B. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

C. Individual plant locations shall be staked on the project site by the Contractor and approved by the Landscape Architect before any planting pits are dug. The Landscape Architect reserves the right to adjust plant material locations to meet field conditions, without additional cost to the Owner.

D. Planting pits shall be round, with vertical sides and flat bottoms and sized in accordance with outlines and dimensions shown on the planting details.

E. Accurately stake plant material according to the drawings. Stakes shall be above grade and painted a bright color to be clearly visible for inspection.

F. If obstructions are encountered that are not indicated, do not proceed with planting operations until alternative plant locations have been selected and approved in writing by the Landscape Architect. Where location or spacing dimensions are not clearly shown, request clarification by the Landscape Architect.

G. See drawings for planting details.

H. Vegetation Removal:

1. Strip existing grass and weeds, including roots, from all bed areas, till and fine grade existing topsoil, leaving the soil surface one-inch below finished grade (in areas shown on plan).
2. Herbicide: Use Round Up (Monsanto Co.) as required to prepare areas for new planting, applied to all ground cover, evergreen and shrubbery beds and all mulch areas before application of pre-emergence herbicide, per manufacturer's recommendations. Clean area of all dead material after five (5) days.
3. Pre-Emergence Herbicide: DACTHAL W-75 (Diamond Shamrock Agricultural Chemicals) applied to one (1) ounce per 100 square feet to same area where "Herbicide" has been applied and after area is cleared of dead vegetation.
4. Herbicides to be applied by Licensed Applicator as required by the State.
3.3 INSTALLATION:

A. Excavate circular plant pits with vertical sides, except for plants specifically indicated to be planted in beds. Provide plant pits per planting details. Depth of pit shall accommodate the root system. Scarify the bottom of the pit to a depth of 4”.

B. Provide pre-mixed planting mixture Type "A" for use around the balls and roots of all deciduous and evergreen tree plantings in planters. Trees planted in earth shall be backfilled with native soil per planting details unless noted otherwise.

C. Beds for Ground Cover, Flowers, Ericaceous Plants and Ornamental Grasses: Excavate existing soil to 12" depth over entire bed area and remove soil from site. Set plants according to drawings and backfill entire bed with pre-mixed planting mixture Type "B".

D. Mass Shrub Beds/Hedge Beds: Excavate existing soil to 18" depth over entire bed area and remove soil from site. Scarify bottom of the bed to a 4" depth. Set plants according to drawings and specifications, and backfill entire bed with (pre-mixed) specified planting mixture Type "A".
E. Planting:

1. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb and faced to give the best appearance or relationship to each other or adjacent structure. Set plant material 2“-3” above the finish grade. No filling will be permitted around trunks or stems. Backfill the pit with planting mixture. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water in non-irrigated areas.

2. After balled and burlapped plants are set, muddle planting soil mixture around bases of balls and fill all voids. Sufficiently compact to prevent settlement.

3. Add “MyCor” Tree Saver to mix per manufacturer’s directions.

4. Remove all burlap, ropes and wires from the tops of balls.

5. Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 12” of the trunks of trees and shrubs within planting bed and to within 6” of edge of bed.


7. Water immediately after planting.

F. Mulching:

1. Mulch tree and shrub planting pits and shrub beds with required mulching material depths per details immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.

G. Wrapping, Guying, Staking:

1. Inspect trees for injury to trunks, evidence of insect infestation and improper pruning before wrapping.

2. Wrap trunks of all trees spirally from bottom to top with specified tree wrap and secure in place.

3. Stake/guy all trees immediately after lawn seeding or sodding operations and prior to acceptance. When high winds or other conditions which may effect tree survival or appearance occur, the Architect shall require immediate staking/guying.

4. Stake deciduous trees 4” caliper and under. Stake evergreen trees 8’-0” height and under. Use two (2) stakes for each tree per details.

5. Guy deciduous trees over 4” caliper. Guy evergreen trees over 8’-0” height. Use three (3) guys per tree.

H. Pruning:

1. Prune branches of deciduous stock, after planting, to balance the loss of roots and preserve the natural character appropriate to the particular plant requirements. Remove or cut back broken, damaged and unsymmetrical growth of new wood.

2. Multiple Leader Plants: Preserve the leader which will best promote the symmetry of the plant. Cut branches flush with the branch collar. Make cut on an angle.

3. Prune evergreen trees only to remove broken or damaged branches.

3.4 MAINTENANCE:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.
3.5 CLEANING:

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris and equipment. Repair damage resulting from planting operations.

END OF SECTION 329300
SECTION 334000 - STORM DRAINAGE FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Provide all labor, materials, necessary equipment and services to complete the Storm Drainage Facilities work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. Related Work Specified Elsewhere but not Limited to:

1. Section 312000: Earthwork for Site
2. Section 321216: Asphalt Concrete Paving
3. Section 334600: Underdrainage System

C. All items that are not specified within these specifications, but that are essential to the proper construction of the improvements in question, shall be of material and construction in accordance with the current MDOT Standard Specifications for construction.

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for storm sewage system materials and products.

B. Certification: Submit certification signed by drainage system installer that installed materials conform to specified requirements and system was successfully checked and tested prior to covering with drainage fill.

C. Record Drawings: At project closeout, submit record drawings of installed storm sewage piping and products, in accordance with requirements of Division 1.

D. Maintenance Data: Submit maintenance data and parts lists for storm sewage system materials and products. Include this data, product data, shop drawings and record drawings in maintenance manual, in accordance with requirements of Division 1.

1.4 QUALITY ASSURANCE:

A. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of storm sewage system's materials and products.

B. Comply with standards and specifications where applicable of Michigan Department of Transportation (MDOT).

C. Comply with local governing building codes, regulations and specifications where applicable and if more stringent than specified.
1.5 EXISTING UTILITIES:

A. Clearing or installation of pipe and all drainage structures shall be confined within the working limits of the trenches. Trees, utility poles, survey monuments, underground and overhead utilities shall be suitably protected and preserved.

B. Furnish temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, cables, etc. and other obstructions encountered in the progress of the work.

C. When the grade of alignment of the pipe is obstructed by existing utility structures, such as conduits, ducts, pipes, branch connections to water or sewer mains and other obstructions, the obstructions shall be permanently supported, relocated, removed or reconstructed by the Contractor in cooperation with the Owner of such structures. No deviation shall be made from the required line or grade except as directed in writing by the Architect.

D. It shall be the responsibility of the Contractor to notify the Owners of existing utilities in the area of construction a minimum of 48 hours prior to any excavation adjacent to such utilities, so that field locations of said utilities may be established.

PART 2 - PRODUCTS

2.1 PIPE:

A. Plastic Pipe:

1. Acrylonitrile-Butadiene-Styrene (ABS) and Polyvinyl Chloride (PVC) Composite Sewer Pipe: ASTM D-2680, 200 psi stiffness, 8" through 15" standard laying lengths of 20' or 40'.
   a. Fittings: ABS or PVC, ASTM D-2680, solvent cement joints or elastomeric joints complying with ASTM D-3212 using gaskets complying with ASTM F-477.

2. Polyvinyl Chloride (PVC) Sewer Pipe: ASTM D-3034, Type PSM, SDR 35.
   a. Fittings: PVC, ASTM D-3033 or D-3034, solvent cement joints complying with ASTM D-2855 using solvent cement complying with ASTM D-2564; or elastomeric joints complying with ASTM D-3212 using elastomeric seals complying with ASTM F-477.


B. Reinforced Concrete Culvert Pipe:

1. Concrete pipe shall be produced by a reputable manufacturer engaged in the full time business of manufacturing concrete pipe. Pipe manufacturer shall produce the pipe from an approved, permanent plant acceptable to the Architect.

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2. All concrete pipe shall be reinforced and shall conform to the requirements of ASTM C-76. Reinforced Concrete Culvert, Storm Drain and Sewer Pipe. All pipe shall be the Class III and wall B unless otherwise noted.

3. Concrete pipe may be either bell and spigot, tongue and groove or modified tongue and groove.

4. Internal rubber gasket joints may be used to Contractor's option. The internal rubber gasket joint shall be supplied by the pipe manufacturer and shall be completely compatible in every respect with the pipe furnished. The rubber gasket on the inside of the bell or groove shall be installed on the pipe at the plant by the pipe manufacturer. All materials and accessories for the rubber gasket joint and the methods of jointing shall be in strict conformance with the pipe manufacturer's direction and recommendation. Joint must be completely watertight.

5. Cement grout joints shall be completely watertight and acceptable to the Architect. A full bed of mortar shall be placed in the bell and/or groove and on the tongue and/or spigot. The annular space in the pipe joint shall be wiped with cement mortar to insure the joint is filled and to present a smooth surface. The complete exterior periphery of the joint shall have a standard cement grout diaper joint. Diaper shall be installed with the aid of an approved cloth ring. Cement mortar joints shall be made in the dry. Mortar and grout shall be one part Portland Cement to two parts by weight of sand. Mortar shall have enough water to make a stiff mixture that can be molded and worked. Cement mortar joints shall not be covered until inspected and approved by the Architect.

C. Vitrified Clay Pipe:

1. Extra strength vitrified clay pipe per ASTM C-700 with flexible compression joints per ASTM C-425.

D. High Density Polyethylene:

1. Smooth lined, corrugated pipe meeting requirements of AASHTO M-252 and M-294, with watertight bell and spigot joints.

2.2 GRATES:

A. All castings shall be ductile iron, heavy duty. Castings shall be smooth, true to pattern and free of projections, sand holes, warp and other defects. All frames and covers shall be machined, non-rocking.

B. Castings shall be coated with coal tar pitch varnish to make a smooth coating, tough and tenacious when cold, not tacky and not brittle.

C. Grates or covers for inlets shall be as shown on the plans, set to the grades indicated and conforming with the requirements of the castings described above. Grates shall be furnished complete with frames specifically constructed to provide full bearing at all points of contact.

2.3 STORM SEWER MANHOLES:

A. General: Provide precast reinforced concrete storm sewer manholes as indicated, complying with ASTM C-478.

B. Top: Precast concrete, of concentric cone, eccentric cone, or flat slab top type, as indicated.
C. Base: Precast concrete, with base riser section and separate base slab, or base riser section with integral floor, as indicated.

D. Steps: Ductile-iron, aluminum or steel reinforced plastic integrally cast into manhole sidewalls.

E. Frame and Cover: Ductile-iron, heavy-duty, non-rocking, indented top design, with lettering cast into top reading "STORM SEWER". See drawings for model and manufacturer.

F. Pipe Connectors: Resilient, complying with ASTM C-923. Use "A-Lok" gasket (ASTM C-443), precast into manhole or "Kor-N-Seal" rubber boot.

G. Concrete for precast components shall have not less than 3,000 psi compressive strength at 28 days.

H. Concrete for built-up manholes shall have not less than 3,000 psi compressive strength at 28 days.


2.4 CATCH BASINS:

A. General: Provide precast reinforced concrete catch basins, as indicated.

B. Basin: Precast reinforced concrete, 24" diameter as shown flat slab top, base riser section with integral floor.

C. Steps: Ductile-iron, aluminum or steel reinforced plastic integrally cast into catch basin sidewalls.

D. Frame and Grate: Ductile-iron, heavy-duty, non-rocking, see drawings for model and manufacturer.

E. Pipe Connectors: Resilient, complying with ASTM C-923. Use "A-Lok" gasket (ASTM C-443), precast into manhole or "Kor-N-Seal" rubber boot.

F. Concrete for precast components shall have not less than 3,000 psi compressive strength at 28 days.

G. Concrete for built-up manholes shall have not less than 3,000 psi compressive strength at 28 days.

PART 3 - EXECUTION

3.1 EXCAVATIONS:

A. Excavation shall be by open cut, except as otherwise shown or permitted. Excavation may be performed by any practiced method consistent with the integrity and protection of the work and adjoining structures and the protection of workmen and the public. Trenches, which must be kept as nearly vertical as possible, shall be properly sheeted and braced. Where in the opinion of the Architect, damage could result from withdrawing sheeting, the sheeting shall be left in
place. Not more than 100 feet of trench shall be opened at any one time or in advance of pipe laying unless permitted by the Architect.

1. Except in rock, water-bearing earth or where a granular or concrete base is to be used, mechanical excavation of trenches shall be stopped above the final grade elevation so that the pipe may be laid on a firm, undisturbed native earth bed. If overdigging occurs, all loosened earth shall be removed and the trench bottom brought back to grade with granular material.

2. Excavations and trenches in rock shall be carried to a depth of not less than 4" below the pipe bottom. This space shall be filled with granular material or washed rock.

3. Width of trenches shall be such as to provide adequate space for placing and jointing pipe properly, but in every case the trench shall be kept to a minimum width.

4. Any unstable soil encountered shall be removed and replaced with gravel, crushed rock or rock and sand suitable compacted.

3.2 PREPARATION TO TRENCH BOTTOM:

A. Water shall not be allowed in the trenches while the trench bottom is being prepared or while pipe is being installed, unless directed by the Architect.

B. A continuous trough shall be shaped to receive the bottom quadrant of the pipe barrel. Bell holes shall be excavated so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom.

C. Preparation of the trench bottom and placement of the pipe shall be places in the trench bottom a minimum of 4" below the bottom of the pipe and a trough as described above shall be formed to uniformly support the bottom quadrant of the pipe barrel.

3.3 INSTALLATION OF DRAINAGE PIPE:

A. Pipe shall be protected during handling against impact shocks and free falls. Pipe shall be kept clean at all times and no pipe shall be used that does not conform to the Specifications.

B. The laying of the pipe shall be commenced at the lowest point with spigot ends pointing in the direction of flow. All pipe shall be laid in accordance with manufacturer's requirements as approved by the Architect.

C. Pipe shall be laid accurately to the line and grade as designated on the plans. Preparatory to making pipe joints, all surfaces of the portions of the pipe to be jointed or of the factory made jointing material shall be cleaned and dry. Lubricant, primers, adhesive, etc., shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing materials or factory fabricated joints shall then be place, fitted, jointed and adjusted in such a manner as to obtain a watertight line. As soon as possible, after the joint is made, sufficient backfill material shall be placed along each side of the pipe to prevent movement of pipe off line and grade.

1. The exposed ends of all pipe shall be suitably plugged to prevent earth, water or other substances from entering the pipe when construction is not in progress.

3.4 BACKFILLING TRENCHES:

A. Under no circumstances shall water be permitted to rise in unbackfilled trenches after pipe has been placed. Trenches shall be backfilled with approved material free of large clods, stones
and rocks and carefully deposited in layers not to exceed 4" until enough fill has been placed to provide a cover of not less than 1' above the pipe. Each layer shall be placed, then carefully and uniformly tamped, so as to eliminate the possibility of pipe displacement. The remainder of backfill materials shall then be placed, moistened and compacted in 8" layers to 90% maximum AASHTO T-180 density. Backfill for sewers within the limits of a traffic area, as shown on the plans, or as directed by the Architect, shall be Granular Material Class II and shall be placed in 8" layers and compacted to 98% maximum AASHO T-180 density.

B. Whenever the trenches have been improperly filled or if settlement occurs, they shall be refilled, compacted, smoothed off and made to conform to grade.

3.5 CONCRETE ENCASEMENT OF DRAINAGE PIPE:

A. Trenches in which encasements for pipe are to be placed, may be excavated completely with mechanical equipment. Prior to formation of the encasement, temporary supports consisting of timber wedges or masonry shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at no more than two places, one at the bottom of the barrel of the pipe adjacent to the shoulder of the socket and the other near the spigot end.

3.6 PRECAST MANHOLES AND CATCH BASINS:

A. General: Place precast concrete sections as indicated. Where manholes occur in pavements, set tops of frames and covers flush with finish surface. Elsewhere, set tops 3" above finish surface, unless otherwise indicated.

B. Install in accordance with ASTM C-891.

C. All joints shall be finished watertight; all openings for sewers, frames, etc. in precast manholes and catch basins shall be cast at time of manufacture. Spaces around all piping entering or leaving manholes shall be completely filled with non-shrink grout.

D. All manholes shall be set plumb to line and grade and shall rest on a firm carefully graded subgrade which shall provide uniform bearing under base.

E. Grout for manhole bottoms shall consist of broken block, brick and 2:1 cement mortar.

3.7 DRAINAGE STRUCTURES:

A. All structures shall be built to the line and grade shown on drawings. All reinforced concrete work shall be in strict conformance with the concrete specifications, contained herein. After erection of the forms and placing of the steel, the Contractor must have inspection and approval from the Engineers before placing any concrete. After removal of the forms, the Contractor shall backfill around each structure with approved granular fill. The fill shall be placed in layers not exceeding 12" in depth measure loose and compacted to 98% of the maximum density as determined by the modified proctor, AASHTO T 180. No defects of any kind in the pipe section will be accepted. All pipe stubs shall be made of the same type of pipe. Pipe stubs shall be sealed with a concrete plug, watertight. The ends of the pipes which enter masonry shall be neatly cut to fit the inner face of the masonry. Cutting shall be done before the pipes are built in.
3.8 INSPECTION:

A. All sewers shall be lamped by an outside testing company as agreeable to the Owner’s Representative and paid for by the contractor prior to acceptance of the work. The report shall be submitted to the Architect for approval. Repairs or misalignment shown necessary by the tests shall be corrected at the Contractor's expense. All sewers shall be thoroughly cleaned before being placed into use and shall be kept clean until final acceptance by the Architect.

3.9 INFILTRATION AND EXFILTRATION TESTS:

A. Tests for water tightness shall be made by the Contractor. Leakage of completed sewer system shall not exceed 500 U.S. gallons per day per inch diameter per mile of pipe under minimum hydrostatic pressure of 2’. Test shall be conducted in a manner satisfactory to the Architect. Any portion of the project not conforming to the above requirements shall be corrected by the Contractor, at his own expense, prior to acceptance by the Architect.

3.10 RESTORATION OF SURFACE AND/OR STRUCTURES:

A. The Contractor shall restore and/or replace paving, curbing, sidewalks, fences and survey points or any other disturbed surfaces or structures to a condition equal to that before the work was begun and to the satisfaction of the Architect. Relative to restoration of surfaces and/or structures, the Contractor shall comply with all requirements of governing agencies including city, town, county and state.

END OF SECTION 334000
SECTION 334600 - UNDERDRAINAGE SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of Underdrainage System work is shown on drawings.

B. Underdrainage System Work Includes the Following:

1. Perforated underdrains and connections to existing manholes and catch basins.
2. Rigid drainage system beneath pavement.

C. Related Work Specified Elsewhere:

1. Section 312000: Earthwork for Site
2. Section 329119: Topsoil
3. Section 329223: Sodding
4. Section 329300: Plants
5. Section 334000: Storm Drainage Facilities

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for underdrainage system materials and products.

B. Certification: Submit certification signed by underdrainage system installer that installed materials conform to specified requirements and system was successfully checked and tested prior to covering with drainage fill.

C. Record Drawings: At project closeout, submit record drawings of installed underdrainage system piping and products.

1.4 QUALITY ASSURANCE:

A. Installers' Qualifications: Firm with at least 3 years of successful installation experience on projects with underdrainage system work similar to that required for project.

B. Codes and Standards:

1. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of underdrainage system's materials and products.

PART 2 - PRODUCTS

2.1 CONDUCTING PIPES AND PIPE FITTINGS:
A. General: Provide pipes of the following materials, of weight/class indicated. Provide pipe fittings and accessories of same material and weight/class as pipes, with joining method as indicated. See drawings for size of pipe required.

2.2 PERFORATED DRAINS:

A. Furnish drainage pipe complete with bends, reducers, adapters, couplings, collars and joint materials.

B. Provide perforated, corrugated, single wall polyethylene tubing, ASTM F-405.

C. Manufacturer: Subject to compliance with requirements, provide drainage system products of one of the following:

1. Advanced Drainage Systems, Inc., 4640 Trueman Blvd., Hilliard, OH 43026, (800) 821-6710
2. Other approved.

2.3 RIGID DRAINAGE SYSTEM BENEATH PAVEMENT:

A. Provide polyvinyl chloride tubing for drainage and sleeving; see plans for sizing. All material shall be rigid, unplasticized, extruded from virgin parent material. Tubing shall conform with ASTM D-2241 Classification. Pipe shall be Schedule 40, homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, wornholes or dents.

B. Provide insert polyethylene fittings, ASTM D-2609, or PVC fittings with gasketed joints.

2.4 TRENCH MATERIALS:

A. Drainage Fill (Perforated): Evenly graded mixture of Peastone.

B. Impervious Fill (Rigid): Clayey gravel and sand mixture capable of compacting to a dense composite.

C. Filter Fabric: Approved non-woven cloth filter fabric from one of the following suppliers, or approved substitute:

1. Dupont, Inc. Typar 3201
2. Mirafi 140 N

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Installer must examine the areas and conditions under which underdrainage system work is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 PERFORATED DRAINAGE SYSTEM:

A. Excavation:
UNDERDRAINAGE SYSTEM

3.3 RIGID DRAIN SYSTEM:

A. Excavation:
   1. Excavate for underdrainage system to provide a clear horizontal distance between drain pipe and trench wall on both sides not less than 2 times diameter of drain pipe and sufficient depth to provide not less than 4" compacted impervious fill unless subgrade is already equivalent of impervious fill. Grade bottom of trench excavations to required slope and compact to a firm, solid bed for drain system.
   2. Install and compact impervious fill material to not less than 4" depth in bottom of trench.

B. Laying Drain Pipe:
   1. Lay perforated pipe solidly bedded in filtering material (peastone). Provide full bearing for each pipe section throughout its length to true grades and alignment, and continuous slope in the direction of flow.
   2. Lay perforated pipe with perforations down and joints tightly closed in accordance with pipe manufacturer's recommendations. Provide collars and couplings as required.
   3. Connect pipe runs per plans. Provide positive unobstructed flow.
   4. Clean out drainage system, remove all soil and debris that has entered system during construction.

C. Testing Drainage Lines:
   1. Test or check lines before backfilling to assure free flow. Remove obstructions, replace damaged components and retest system until satisfactory.
   2. After testing drain lines, place not less than 4" additional drainage fill material on top of drain line and either side.

D. Drainage Fill: (Type 1 Drainage Trench)
   1. Backfill trench with drainage fill to encapsulate, cover and fill trench to within 4" of finish grade.
   2. Cover trench with non-woven cloth filter fabric prior to back filling with soil.
   3. Install and compact topsoil over trench as indicated in typical detail.

E. Drainage Fill: (Type 2 Conducting Trench)
   1. Backfill trench with drainage fill to encapsulate, cover and fill trench to minimum 4" over top of drainage pipe.
   2. Cover backfill with non-woven cloth filter fabric. Ensure complete coverage of drainage fill prior to backfilling trench with soil.
   3. Backfill remainder of trench with native excavated material, breakup clumps so as not to exceed 1" in diameter, to within 4" of finish grade.
   4. Install and compact topsoil over trench as indicated in typical detail.
1. Lay drainpipe solidly bedded in compacted sand material 95% density (see drawings). Provide full bearing for each pipe section throughout its length, to true grades and alignment, and continuous slope in the direction of flow.

2. Lay rigid pipe with joints tightly closed in accordance with pipe manufacturer's recommendations. Provide collars and couplings as required.

3. Connect rigid PVC to perforated drain tile at walks. Provide positive unobstructed flow.

4. Clean out drainage system, remove all soil and debris that has entered system during construction.

C. Testing Drain Lines:

1. Test or check lines before backfilling to assure free flow. Remove obstructions, replace damaged components, and retest system until satisfactory.

2. After testing drain lines, place not less than 4" additional impervious fill material top of drains and either side.

D. Drainage Fill:

1. Backfill impervious fill (gravel/sand mixture) to encapsulate, cover and fill trench. Compact to within 4" of finish grade depth as indicated in typical detail on drawings.

2. Install and compact topsoil over trench as indicated in typical detail.

3.4 BACKFILLING:

A. General: Conduct backfill operations closely following laying, jointing, and bedding of pipe, and after initial inspection and testing are completed.

3.5 FIELD QUALITY CONTROL:

A. Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction.

END OF SECTION 334600