

PROJECT MANUAL

CHEMICAL STORAGE FACILITY

BID DOCUMENTS
March 14, 2014

Owner:
Calhoun County Road Department
13300 15 Mile Road
Marshall, Michigan 49068

Project Location:
13300 15 Mile Road
Marshall, Michigan 49068



ARCHITECTURE
ENGINEERING
PLANNING
SURVEYING
CONSTRUCTION SERVICES

DLZ Project No.: 1341-6538-90

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INSTRUCTIONS TO BIDDERS

The work included in this proposal consists of furnishing all labor, equipment, and materials, including electrical work and fan(s), for the complete construction of a storage structure, which shall be able to contain 3500 tons of salt.

The structure shall be 70' wide x 155' long x 33'-6" high (to the eaves) and covered ancillary storage lean-tos principally comprised of cast-in-place concrete and wood stud walls, wood trusses, sheathing and asphalt shingles and panel wood siding. The structure will include (3) openings and asphalt pavement within and around the structure.

Proposals

To be entitled to consideration, proposal must be in conformance with the invitation for Bids, Instruction to Bidders, all other documents bound in and referred to as the Specifications, and Drawings. All proposals received by the Owner shall remain in effect for a period of thirty (30) days from date of the bid opening.

Clarification of Documents (Addenda)

Should a Bidder find apparent discrepancies in, or omissions from the documents, or be in doubt as to their true meaning, or have any questions regarding any work or material intended, then such Bidder, either General Bidder or Sub-Bidder, shall immediately notify the Engineer of such questions not later than five (5) days prior to due date for Bids. The Engineer will, if deemed appropriate, clarify or correct such questions by issuance of an Addendum to all General Bidders recorded as having documents in their possession. It shall be the responsibility of the General Bidders to inform their Sub-Bidders and Suppliers of information contained in any Addenda. No Addenda will be issued within two (2) days prior to bid opening.

Neither the Owner nor Engineer will be responsible for any oral instructions unless documented by Addenda.

All Addenda issued shall become a part of the Bidding documents and shall be covered in the Proposal by insertion of the Addendum number in the allotted space on the Proposal form.

It shall be understood and agreed that the requirements contained in all documents shall apply to all Addenda items and the general character of the work called for in the Addenda shall be same as originally required for similar work, unless otherwise mentioned, and that all incidental work necessitated shall be included.

Documents

The Contract is made up of the following documents:

- a. Addenda (if issued)
- b. Invitation for Bids
- c. Instructions to Bidders
- d. Proposal
- e. Performance and Payment Bonds
- f. Certificates of Insurance
- g. Technical Specifications
- h. Detailed Plans

Instructions for preparing Proposals

Proposals shall be submitted on the forms provided by the Engineer. All applicable blank spaces in the form shall be filled in. Numbers shall be stated both in writing and figures, and in case of discrepancy between the amount stated in writing and the amount stated in figures, the amount stated in writing shall govern. The signatures shall be in longhand. The person signing shall give his name, address, and status as “Individual”, “Partnership”, or “Corporation” as well as evidence of his authority to act in behalf of the Bidder.

No oral, telegraphic, or telephone proposals will be considered.

Before submitting a proposal, Bidders shall carefully examine the bidding documents, visit the site, and fully inform themselves as to all existing conditions and limitations. No additional compensation for the omission of any work, materials, and/or labor required to complete the work in accordance with the contract will be granted due to the Bidder’s failure to conform to these requirements.

Qualification of Bidders

Upon request of the Engineer, Bidders shall be prepared to file with him statements setting forth previous experience, references, equipment possessed, description of organization, financial resources, and such other evidence as may testify to ability to carry out the Contract.

Guaranty Bonds

Each Bidder shall figure the cost of a surety bond in an amount equal to 100 percent of his proposal as security for payment of all persons performing labor and furnishing materials in connection with the Contract.

Each Bidder shall also figure the cost of a separate surety bond in an amount equal to 100 percent of his proposal as surety for faithful performance of the Contract.

Successful Bidder will be required to furnish and pay for the above-referenced bonds. Cost to be included in base bid for building.

As such time as the Owner decides conclusively which of the Bidders shall be awarded the Contract, the Owner shall serve the Bidder with a formal notice of award. At that time, the contract shall be considered awarded.

Proposal Guaranty

Each proposal must be accompanied by a certified check, cashier's check, bid bond or bank money order in the amount not less than five (5) percent of the proposal amount. This security shall be made payable to Calhoun County Treasurer, in order to secure said organization from loss or damage by reason of withdrawal of the bid or failure of the Bidder to enter into a contract if the bid is accepted within a 30-day period. Proposal guaranty will be forfeited in the event accepted Bidder fails or refuses to enter into a Contract within ten (10) days after the award of Contract.

General Building Permit

Bidders shall include the cost of the building permit in their bid. If the owner has already secured the building permit, the bidder upon being awarded the construction contract, will reimburse the owner the cost of the building permit.

Wage Scale

All bidders must comply with the prevailing wage rates for Calhoun County which are included herein.

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DOCUMENT 003132 - GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

- B. A Geotechnical Investigation Report for Project, prepared by Soil and Materials Engineers, Inc., dated October 11, 2013, is available for viewing as appended to this Document. Refer to **Exhibit 00 31 32-A**.

END OF DOCUMENT 003132

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October 11, 2013

Mr. Kyle Kopper, PE
DLZ Michigan, Inc.
1425 Keystone Avenue
Lansing, Michigan 48911

Via e-mail: kkopper@dlzcorp.com (PDF file)

Re: Geotechnical Evaluation Report
Salt Storage Barn
Marshall Township, Michigan
SME Project No. 068514.00

Dear Mr. Kopper:

Soil and Materials Engineers, Inc. (SME) has completed our geotechnical evaluation for the proposed salt storage barn at the Calhoun County Road Commission yard in Marshall Township, Michigan. This report presents the results of our observations and analyses, and our recommendations related to subgrade preparation and earthwork, and foundation design. Additionally, our report presents a short discussion on construction considerations related to the geotechnical conditions disclosed by the borings.

The scope of services outlined in SME Proposal No. P01957.13 dated July 25, 2013, was generally followed for this geotechnical evaluation. Please refer to that document for the specific scope of services. DLZ Michigan, Inc. (DLZ) authorized SME's services for this evaluation.

SITE CONDITIONS AND PROJECT DESCRIPTION

The project site is located at the existing Calhoun County Road Commission (CCRC) yard at 13300 15 Mile Road in Marshall Township, Michigan. The specific location for the proposed salt storage barn is east of the truck and equipment storage building and the sign shop building. The approximate site location is depicted on the aerial photograph included as an inset on the attached Boring Location Diagram.

The site is relatively flat. Based on the topographic information included on the Topo Survey plan dated April 13, 2011, prepared by Civil Engineers, Inc., existing ground surface levels within the proposed building footprint are between approximately elevations 909 and 913 feet. Gravel and asphalt cold-patch stockpiles are stored on the site.

OFFICES
Indiana
Michigan
Ohio

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consultants in the geosciences, materials, and the environment

The project consists of the design and construction of a salt storage barn. The new structure will measure about 155 feet by 70 feet in plan view. Lean-to structures will extend beyond the barn footprint on the east and west sides. Partial-height concrete masonry unit screen walls will be constructed along the north and south end of the lean-to on the east side of the building. The floor of the new barn will consist of asphalt concrete pavement.

The perimeter of the barn will be composed of cast-in-place concrete walls supported on continuous strip foundations. The perimeter walls will extend about 16 feet above the finish floor elevation. Roof trusses will be supported on top of the concrete walls and will extend up to a maximum clear height of 31 feet on the interior of the barn. The foundations and perimeter concrete walls of the barn will be designed to resist lateral pressures from the salt stored inside the structure.

The loads for the salt to be stored were not provided. However, we anticipate the salt will impart a pressure of about 2,000 pounds per square-foot (psf) on the barn floor (assuming a storage height of salt of about 30 feet). We anticipate maximum vertical wall loads will be less than about 5 kips per linear foot.

Based on the relatively flat existing site topography, we anticipate cuts and fills of less than about 3 feet will be required to establish final subgrade levels within the proposed building footprint.

EVALUATION PROCEDURES

Borings

SME drilled four borings (B1 through B4) at the project site on September 27, 2013. The borings each extended about 20 feet beneath the existing ground surface, for a total of about 80 feet of drilling. The approximate locations of the borings are shown on the Boring Location Diagram.

The number, locations, and depths of the borings were determined by SME. Prior to drilling, SME marked the boring locations in the field using a measurement wheel and referencing from existing site features. Existing ground surface elevations at the boring locations were estimated by SME to the nearest 0.5-foot based on existing site topographic information included on the referenced Topo Survey plan.

The borings were drilled using a truck-mounted rotary drill rig mounted and were advanced to the sampling depths using continuous-flight, solid-stem augers. The borings included soil sampling based upon the split-barrel sampling procedure. Soil samples collected from the borings were sealed in glass jars.

Groundwater measurements were recorded during drilling and immediately after completion of the drilling operations. Since the boreholes were backfilled with soil cuttings shortly after drilling and sampling, long-term groundwater level information is not available from the borings.

Laboratory Testing

Soil samples collected from the field exploration were returned to the SME laboratory for further observation and testing. The laboratory testing program consisted of performing visual soil classification on the recovered samples based on the procedures outlined in ASTM D2488, along with performing moisture content and hand penetrometer tests on portions of cohesive samples



obtained. The laboratory tests performed are described on the attached Laboratory Testing Procedures. Based on the laboratory testing, we assigned a group symbol to the various soil strata encountered based on the Unified Soil Classification System (USCS).

Upon completion of the laboratory testing, boring logs were prepared and include information on materials encountered, penetration resistances, pertinent field observations made during the drilling operations, and results of the laboratory tests. Explanations of symbols and terms used on the borings logs are provided on the attached Boring Log Terminology sheet. The boring logs are attached to this report. The soil descriptions included on the boring logs were developed from both visual classification and the results of laboratory tests, where applicable.

Soil samples, retained over a long time, even sealed in jars, are subject to moisture loss and are no longer representative of the conditions initially encountered in the field. Therefore, soil samples are normally retained in our laboratory for 60 days and then disposed, unless instructed otherwise.

SUBSURFACE CONDITIONS

The soil conditions encountered at the borings generally consisted of surface gravel over sand and/or clay fill, underlain by natural sand that extended to the explored depths of the borings. A generalized summary of the materials encountered at the boring locations, beginning at the existing ground surface and proceeding downward, is provided below.

Stratum 1: Gravel. The driller reported about 2.5 to 4 inches of gravel at the surface of borings B2 and B3. About 1 foot of mixed sand, gravel, and asphalt was encountered at the surface of boring B1.

Stratum 2: Sand and/or Clay Fill. Sand fill was encountered beneath the Stratum 1 materials at boring B1, extending to about 3 feet beneath the existing ground surface. Sand and clay fill was encountered at the ground surface or beneath the Stratum 1 materials at the remaining borings, extending to about 8 feet beneath the existing ground surface.

Standard Penetration Test (SPT) resistances (N-values) of 6 to 43 blows per foot (bpf) were obtained in the sand fill, indicating a loose to dense condition. However, a majority of the sand fill exhibited a medium dense condition.

Shear strength estimates of the clay fill ranged from about 2.25 to 3.25 kips per square-foot (ksf), indicating a very stiff consistency. The clay fill exhibited moisture contents of about 15 percent.

Stratum 3: Natural Sand. Natural sand was encountered beneath the fill, extending to the explored depth of borings B1 through B3 and to about 17 feet beneath the existing ground surface at boring B4. N-values within the natural sand ranged from 11 bpf to 50 blows for 5 inches of penetration, indicating a medium dense to extremely dense condition.



A strata of natural clay was encountered beneath the natural sand at boring B4, extending to the explored depth of that boring. A shear strength estimate within the natural clay of 1.25 ksf indicates a stiff consistency. The natural clay exhibited a moisture content of about 28 percent.

The soil descriptions and properties, in addition to groundwater conditions observed by the driller, are graphically presented on the attached boring logs. Please refer to the logs for the soil conditions encountered at the boring locations. Soil conditions may vary between or away from the boring locations. The stratification depths shown on the logs and discussed above are intended to indicate a zone of transition between soil types. The stratification lines are not intended to show an area of exact geological change. The soil descriptions are based on visual classification of the encountered soil.

Groundwater was encountered at boring B4 about 17 feet beneath the existing ground surface both during and upon completion of drilling. Groundwater was not encountered at the remaining borings. The groundwater encountered at boring B4 appeared to be perched within the natural sand overlying the relatively impermeable natural clay.

Groundwater elevations and volumes of groundwater should be expected to fluctuate throughout the year, based on variations in precipitation, evaporation, run-off, and other factors. The groundwater levels indicated by the borings and presented in this section represent conditions at the time the readings were taken. The actual groundwater levels at the time of construction may vary.

ANALYSIS AND RECOMMENDATIONS

General Site Subgrade Preparation

Fill was encountered in the upper 3 to 8 feet of the borings. Based on the condition of the fill encountered in the borings, we judge the fill to be generally suitable for support of pavements, slabs, and foundations. However, it is not known whether or not the fill was placed as engineered fill. For fill to be considered engineered fill, the fill should be free of organics and deleterious materials, placed in lifts, and suitably compacted on an approved subgrade to a defined minimum dry density at a moisture content near optimum for the soil. The placement and compaction operations should also be observed by a geotechnical engineer and compaction tests done to document the fill being placed meets the specified minimum dry density. In the absence of such documentation, the fill is assumed to have been placed in an uncontrolled manner. Thus, if the Owner is unwilling to accept the risk of poor performance associated with constructing pavements, grade-slabs, and/or foundations on or above the existing undocumented fill at this site, then the existing fill should be completely removed and replaced with properly prepared engineered fill within the footprint of the proposed salt storage building. However, this approach may be cost prohibitive due to the depth of the existing fills (about 3 to 8 feet) at the boring locations.



The degree of risk associated with constructing on or above the existing fill can be reduced by performing additional exploration to further evaluate the nature and extent of the existing fill, and by properly preparing the exposed existing fill at foundation bearing elevations prior to concrete placement. We recommend additional exploration, including the excavation of test pits, prior to construction and probing the exposed subgrade with hand-operated equipment, such as dynamic cone penetrometers and hand augers, during construction. If there are construction records indicating the fill was placed in a controlled manner, then the risk associated with constructing on or above the existing fill may be significantly reduced.

As indicated above, if the Owner is unwilling to accept the risks associated with constructing grade-slabs and foundations on or above the existing fill, then the existing fill should be completely removed and replaced with engineered fill. For the purposes of this report, we have assumed the Owner is willing to accept the additional risks, and that the existing fill will be further evaluated and generally left in-place. SME should be contacted if this assumption is incorrect.

The proposed building and pavement areas and areas to receive engineered fill should be cleared of existing pavements, concrete, topsoil, unsuitable fill, and other deleterious materials to expose the underlying inorganic subgrade soils. Since the exposed subgrade soils will consist of sand and clay (assuming the fill is left in place), transition areas between sands and clays could be present at the final subgrade levels for slabs and pavements. Where transition areas are exposed at the final subgrade level, we recommend the upper 12 inches of the exposed subgrade for 10 feet on both sides of the transition be scarified, blended, and re-compacted to a minimum 95 percent of the maximum Modified Proctor dry density. This will provide a more uniform subgrade for support of grade-slabs and pavements.

After stripping and removal of deleterious materials, and after cuts are made to design subgrade levels, we recommend the exposed subgrade soils be subjected to a comprehensive proofrolling program. The purpose of proofrolling is to locate areas of unsuitably loose or soft subgrade. Proofrolling should be performed with a fully-loaded, tandem-axle truck or other similar pneumatic-tire construction equipment. Areas of unsuitable (i.e., wet, loose, or soft) subgrade revealed during proofrolling should be mechanically improved (compacted) in-place. If it is not possible to compact the unsuitable subgrade, it may be necessary to remove the unsuitable soils and replace them with engineered fill. Suspect areas of existing fill revealed during proofrolling should be further evaluated by extending shallow test pits into the fill and using hand-operated equipment, such as hand-augers and cone penetrometers, to probe the fill.

The clayey subgrade soils encountered in some areas of the site are prone to disturbance, especially when exposed to water and trafficked with construction equipment. If the subgrade is disturbed, it will be necessary to improve the disturbed subgrade or remove and replace the soils with engineered fill, crushed aggregate, or crushed concrete. Placement of crushed aggregate or crushed concrete, possibly with a geotextile for separation, is a traditional treatment to protect soft or easily disturbed subgrades.

After cuts are made to design grades and after the exposed subgrade is proofrolled and improved as necessary, engineered fill may be placed on the exposed subgrade to establish final subgrade levels.



Engineered Fill Requirements

Any fill placed within the construction area, including utility trench backfill, should be an approved material, free of frozen soil, organics, or other deleterious materials. We recommend proposed fill contain no more than 4 percent organic matter by weight, and be free of excessive oversized particles that could hinder compaction efforts. The fill should be spread in level layers not exceeding 9 inches in loose thickness and be compacted to a minimum of 95 percent of the

maximum dry density as determined in accordance with the Modified Proctor test. Sand fill should be compacted with a smooth drum vibratory roller or vibratory plate compactors including either walk-behind types, or plate compactors mounted on a backhoe or excavator (hoe-pacs). Clay fill should be compacted with a sheepsfoot roller at moisture contents between the optimum and two percent below the optimum moisture content determined from a Modified Proctor test.

Based on the information from the borings, the existing fill and the natural sands are generally considered suitable for reuse as general site engineered fill, provided the fill meets the requirements in the previous paragraph. Based on the moisture contents of the clay fill and our experience with similar soils, the clay fill will likely require drying (e.g. discing and aeration) to achieve suitable moisture levels for proper compaction prior to use as engineered fill.

The successful reuse of the on-site soils for engineered fill will depend on the time of year. During cold and wet periods of the year, the subgrade soils can become wet and disturbed and the clays will be difficult to dry. If such conditions occur, the contractor will have to import an approved granular material to the site for engineered fill.

In confined areas (such as in utility trenches), and other areas where compaction is accomplished primarily by hand-operated equipment and drainage is required, an approved granular material such as MDOT Class II granular material should be used as backfill. Thinner lifts may be required in confined spaces to achieve compaction of the backfill.

Imported fill should meet the criteria of MDOT Class II granular material.

Foundations

Shallow spread, continuous, or pier foundations bearing on the undocumented fill or on natural sands are considered feasible for support of the proposed building, including the lean-to foundations, assuming the Owner is willing to accept the increased risks of settlement associated with foundations bearing on or above undocumented fill. For shallow foundations bearing on these soils, a maximum net allowable soil bearing pressure of 2,500 psf is recommended for design.

Alternatively, foundations could bear on suitable natural sands which were encountered beginning about 3 to 8 feet beneath the existing ground surface at the boring locations. For shallow foundations bearing on suitable natural sands, a maximum net allowable soil bearing pressure of 3,500 psf is recommended for design.

Based on the borings and the type of building proposed, we believe the existing is generally suitable for support of shallow spread or continuous foundations, provided the existing fill is thoroughly tested at and below the foundation bearing levels. If weak or overly loose fill is encountered at the design bearing level of the foundations, the existing fill must be removed (i.e., undercut) and replaced with engineered fill.

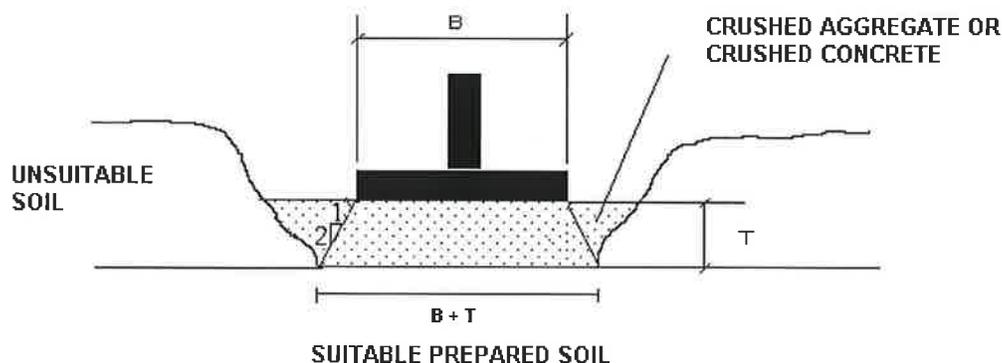


Because placement of foundations on existing, uncontrolled fill is not a conventional procedure, it is imperative the foundation bearing soils at each foundation location be observed, tested, and probed by SME to verify the fill soils are suitable for the design bearing pressure and conditions are as anticipated. Excavating a series of test pits prior to construction is recommended. Based on our experience, some localized undercutting of unsuitable foundation bearing soils may be necessary.

For foundations bearing on existing uncontrolled fill, there is a risk of higher total and differential settlements at some foundation locations due to localized pockets of loose or soft fill and possible organic soils within and below the fill. This risk can be substantially reduced by testing the foundation bearing soils and excavating test pits, as described above. In addition, structurally stiffer strip foundations, such as reinforced grade beams, can reduce differential settlements by spanning localized areas of unsuitable soils.

Based on the proposed construction, we do not believe relatively minor increased foundation settlement will cause significant damage to the structural frame of the building. However, differential settlements could be experienced that result in cracking of the perimeter walls.

Where foundation undercutting and backfilling is performed, the undercut should extend laterally on a two vertical to one horizontal (2V:1H) slope from the outside edge of the foundation. Please refer to the Typical Foundation Undercutting Diagram below:



Once each foundation area is exposed, field-testing by SME should be performed by a proven method for sand and/or clay subgrades. Housel penetrometers are not appropriate for evaluating sand or clay foundation subgrade and their use will give misleading results. SME must be at the construction site to perform tests at the foundation locations to verify the design bearing pressure and to make recommendations for subgrade improvement (if required) on a case-by-case basis. If new foundations are constructed on the existing fill, compaction of the exposed subgrade fill, particularly the sand fill, will be necessary prior to concrete placement.

For bearing capacity and settlement considerations, continuous (wall) foundations should have a minimum width of 18 inches, and column foundations should have a minimum dimension of 30 inches. In some cases where light loads are present, the minimum foundation size criteria may dictate the size of the foundation rather than the allowable soil bearing pressure.

Foundations should be situated a minimum of 42 inches below final site grades along exterior walls or in any unheated areas for protection against frost action during normal winters.

Regardless of whether foundations are constructed on the existing fill, the natural sands, or on engineered fill placed over the natural sands, we anticipate some difficulties with conventional "neat trench" methods of foundation construction through sand fill. For frost heave considerations, trench foundations should be formed in a vertical manner and not be allowed to "mushroom out" near the top. Caved soils should be removed from foundation areas and suitable, undisturbed subgrade soils should be exposed across the entire design trench foundation width prior to foundation concrete placement. For areas where caving and sloughing of trench-type foundations occurs, it will likely be necessary to slope back the excavations and form the foundations or implement other methods to prevent the formation of mushroomed foundations. Provisions should be included in the construction documents for the forming of foundations.

We estimate total settlement for shallow foundations using the recommended maximum net allowable bearing pressures and bearing on suitable soils, as described above, should be less than 1 inch. Differential settlements are estimated to be about one-half the total. The settlement estimates provided are based on the available boring information, estimated structural loads, our experience with similar structures and soil conditions, and field verification of suitable bearing soils by SME.

Construction Considerations

We do not anticipate significant groundwater seepage into shallow foundation and utility excavations. Where encountered, we anticipate seepage into these excavations and can be handled with normal sump pit and pumping methods. In areas where groundwater accumulates, a working surface of crushed aggregate or crushed concrete may be required to protect the exposed surface from disturbance.

The exposed subgrade soils may be easily disturbed due to weather and activity on-site. Therefore, contingencies should be included in the project budget for the improvement of disturbed areas and for measures to prepare a stable subgrade. Disturbed soils will have to be moisture conditioned and recompacted in-place or undercut and replaced with engineered fill.

The contractor must provide a safely sloped excavation or an adequately constructed and braced shoring system in accordance with federal, state and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground. If material is stored or heavy equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads.



We appreciate the opportunity to serve you during this phase of the project. If there are questions concerning this report, or if we can be of further service, please contact us.

Sincerely,

SOIL AND MATERIALS ENGINEERS, INC.


Jeffery M. Krusinga, PE, GE
Senior Consultant

Report Prepared By:

Paul E. Anderson, PE
Project Engineer

Report Reviewed By:

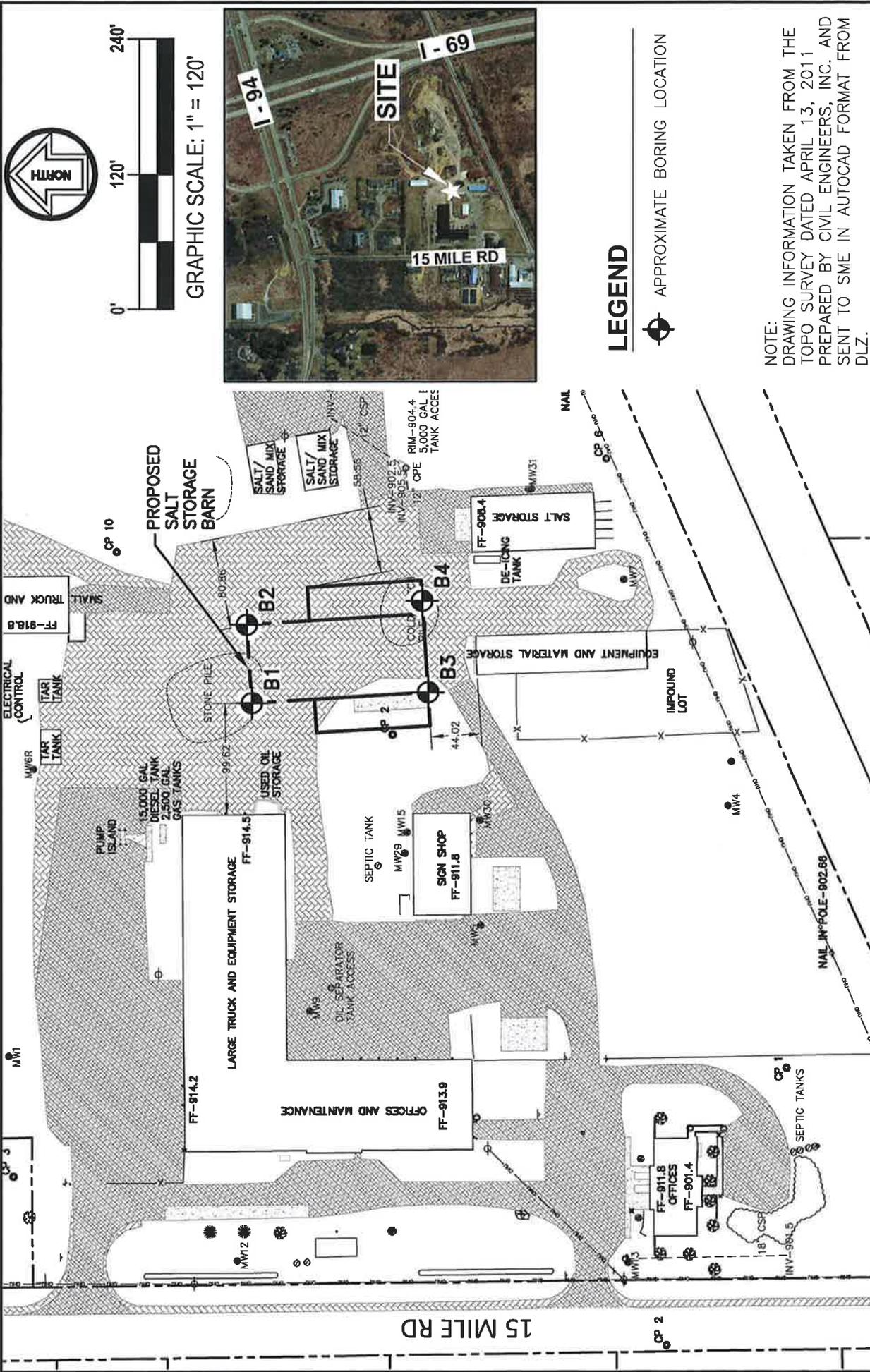
Larry P. Jedele, PE, D.GE
Principal

Attachments: Boring Location Diagram
Boring Log Terminology
Boring Logs (B1 through B4)
Important Information about Your Geotechnical Engineering Report
General Comments
Laboratory Testing Procedures

Enclosure: One original

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	Designed By	PEA								
	Scale	1" = 120'								
	Project	068514.00								
BORING LOCATION DIAGRAM SALT STORAGE BARN MARSHALL TOWNSHIP, MICHIGAN		<table border="1"> <thead> <tr> <th>No.</th> <th>Revision Date</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	No.	Revision Date						
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Figure No. 1

LEGEND

 APPROXIMATE BORING LOCATION

NOTE:
 DRAWING INFORMATION TAKEN FROM THE
 TOPO SURVEY DATED APRIL 13, 2011
 PREPARED BY CIVIL ENGINEERS, INC. AND
 SENT TO SME IN AUTOCAD FORMAT FROM
 DLZ.



BORING LOG TERMINOLOGY

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOIL (more than 50% of material is larger than No. 200 sieve size)		
Clean Gravel (Less than 5% fines)		
GRAVEL More than 50% of coarse fraction larger than No. 4 sieve size		Well-graded gravel; gravel-sand mixtures, little or no fines
		Poorly-graded gravel; gravel-sand mixtures, little or no fines
Gravel with fines (More than 12% fines)		
		Silty gravel; gravel-sand-silt mixtures
		Clayey gravel; gravel-sand-clay mixtures
Clean Sand (Less than 5% fines)		
SAND 50% or more of coarse fraction smaller than No. 4 sieve size		Well-graded sand; sand-gravel mixtures, little or no fines
		Poorly graded sand; sand-gravel mixtures, little or no fines
Sand with fines (More than 12% fines)		
		Silty sand; sand-silt-gravel mixtures
		Clayey sand; sand-clay-gravel mixtures
FINE-GRAINED SOIL (50% or more of material is smaller than No. 200 sieve size)		
SILT AND CLAY Liquid limit less than 50%		Inorganic silt; sandy silt or gravelly silt with slight plasticity
		Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		Organic silt and organic clay of low plasticity
SILT AND CLAY Liquid limit 50% or greater		Inorganic silt of high plasticity, elastic silt
		Inorganic clay of high plasticity, fat clay
		Organic silt and organic clay of high plasticity
HIGHLY ORGANIC SOIL		Peat and other highly organic soil

OTHER MATERIAL SYMBOLS		

LABORATORY CLASSIFICATION CRITERIA	
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3
GP	Not meeting all gradation requirements for GW
GM	Atterberg limits below "A" line or PI less than 4
GC	Atterberg limits above "A" line with PI greater than 7
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3
SP	Not meeting all gradation requirements for SW
SM	Atterberg limits below "A" line or PI less than 4
SC	Atterberg limits above "A" line with PI greater than 7

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

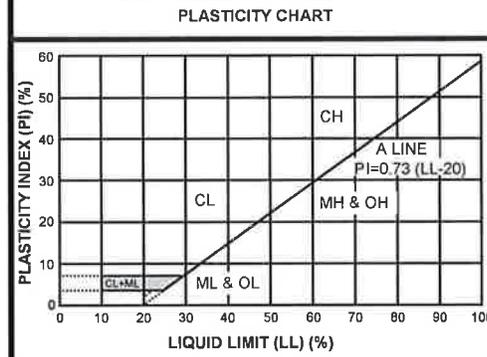
Less than 5 percent.....GW, GP, SW, SP
 More than 12 percent.....GM, GC, SM, SC
 5 to 12 percent.....Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)
- GM-GC (CLAYEY SILTY GRAVEL or CLAYEY SILTY GRAVEL with Sand)

PARTICLE SIZES	
Boulders	- Greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel- Coarse	- 3/4 inches to 3 inches
Fine	- No. 4 to 3/4 inches
Sand- Coarse	- No. 10 to No. 4
Medium	- No. 40 to No. 10
Fine	- No. 200 to No. 40
Silt and Clay	- Less than (0.0074 mm)



VISUAL MANUAL PROCEDURE
When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:
For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:
<ul style="list-style-type: none"> • SC/CL (CLAYEY SAND to Sandy LEAN CLAY) • SM/ML (SILTY SAND to Sandy SILT) • GC/CL (CLAYEY GRAVEL to Gravelly LEAN CLAY) • GM/ML (SILTY GRAVEL to Gravelly SILT)
For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay:
<ul style="list-style-type: none"> • SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand) • SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand) • SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand) • SW/SP (SAND or SAND with Gravel) • GP/GW (GRAVEL or GRAVEL with Sand) • SC/SM (CLAYEY to SILTY SAND) • GM/GC (SILTY to CLAYEY GRAVEL) • CL/ML (SILTY CLAY) • ML/CL (CLAYEY SILT) • CH/MH (FAT CLAY to ELASTIC SILT) • CL/CH (LEAN to FAT CLAY) • MH/ML (ELASTIC SILT to SILT) • OL/OH (ORGANIC SILT or ORGANIC CLAY)

DRILLING AND SAMPLING ABBREVIATIONS	
2ST	- Shelby Tube - 2" O.D.
3ST	- Shelby Tube - 3" O.D.
AS	- Auger Sample
GS	- Grab Sample
LS	- Liner Sample
NR	- No Recovery
PM	- Pressure Meter
RC	- Rock Core diamond bit, NX size, except where noted
SB	- Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	- Vane Shear
WS	- Wash Sample

OTHER ABBREVIATIONS	
WOH	- Weight of Hammer
WOR	- Weight of Rods
SP	- Soil Probe
PID	- Photo Ionization Device
FID	- Flame Ionization Device

DEPOSITIONAL FEATURES	
Parting	- as much as 1/16 inch thick
Seam	- 1/16 inch to 1/2 inch thick
Layer	- 1/2 inch to 12 inches thick
Stratum	- greater than 12 inches thick
Pocket	- deposit of limited lateral extent
Lens	- lenticular deposit
Hardpan/Till	- an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	- soil deposited by lake water
Mottled	- soil irregularly marked with spots of different colors that vary in number and size
Varved	- alternating partings or seams of silt and/or clay
Occasional	- one or less per foot of thickness
Frequent	- more than one per foot of thickness
Interbedded	- strata of soil or beds of rock lying between or alternating with other strata of a different nature

CLASSIFICATION TERMINOLOGY AND CORRELATIONS			
Cohesionless Soils		Cohesive Soils	
Relative Density	N-Value (Blows per foot)	Consistency	N-Value (Blows per foot)
Very Loose	0 to 4	Very Soft	0 - 2
Loose	4 to 10	Soft	2 - 4
Medium Dense	10 to 30	Medium	4 - 8
Dense	30 to 50	Stiff	8 - 15
Very Dense	50 to 80	Very Stiff	15 - 30
Extremely Dense	Over 80	Hard	> 30
		Undrained Shear Strength (kips/ft²)	
		0.25 or less	
		0.25 to 0.50	
		0.50 to 1.0	
		1.0 to 2.0	
		2.0 to 4.0	
		4.0 or greater	

Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted.



PROJECT NAME: Salt Storage Barn

PROJECT NUMBER: 068514.00

CLIENT: DLZ Michigan

PROJECT LOCATION: Marshall, Michigan

DATE STARTED: 9/27/13

COMPLETED: 9/27/13

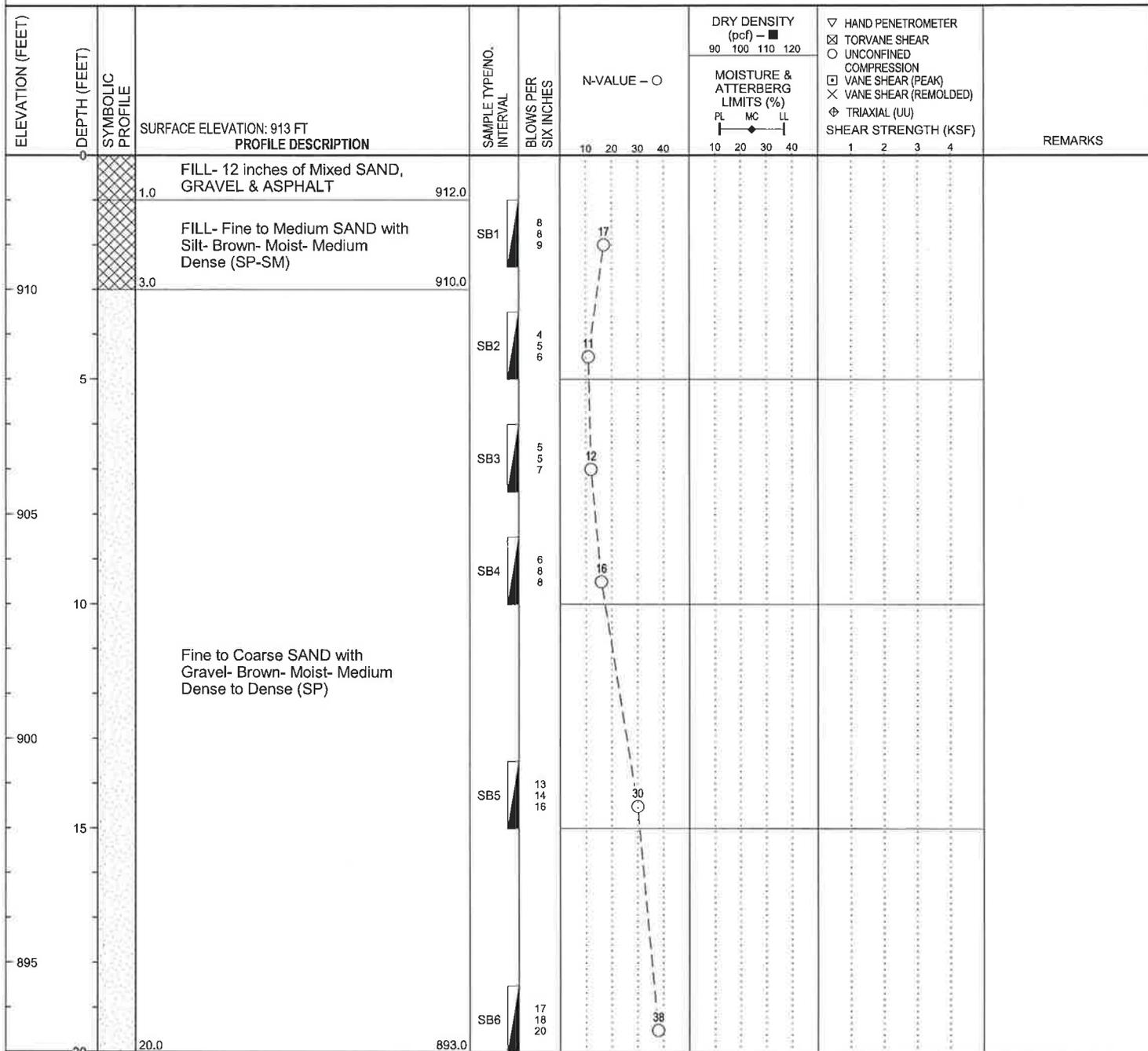
BORING METHOD: Solid-stem Augers

DRILLER: JR

RIG NO.: 253

LOGGED BY: JMK

CHECKED BY: ATB



END OF BORING AT 20.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.



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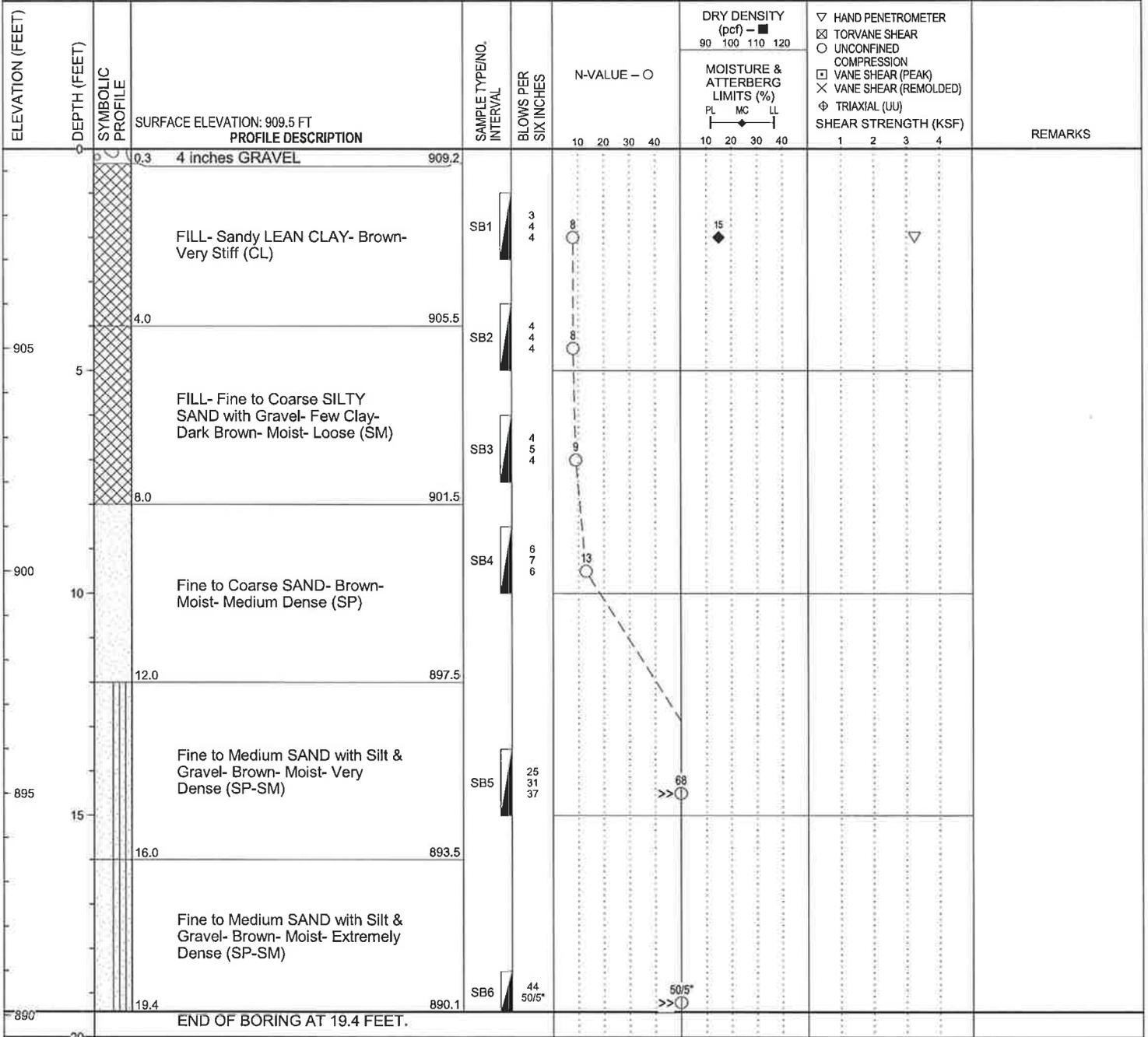
BORING METHOD: Solid-stem Augers

DRILLER: JR

RIG NO.: 253

LOGGED BY: JMK

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GROUNDWATER & BACKFILL INFORMATION	NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
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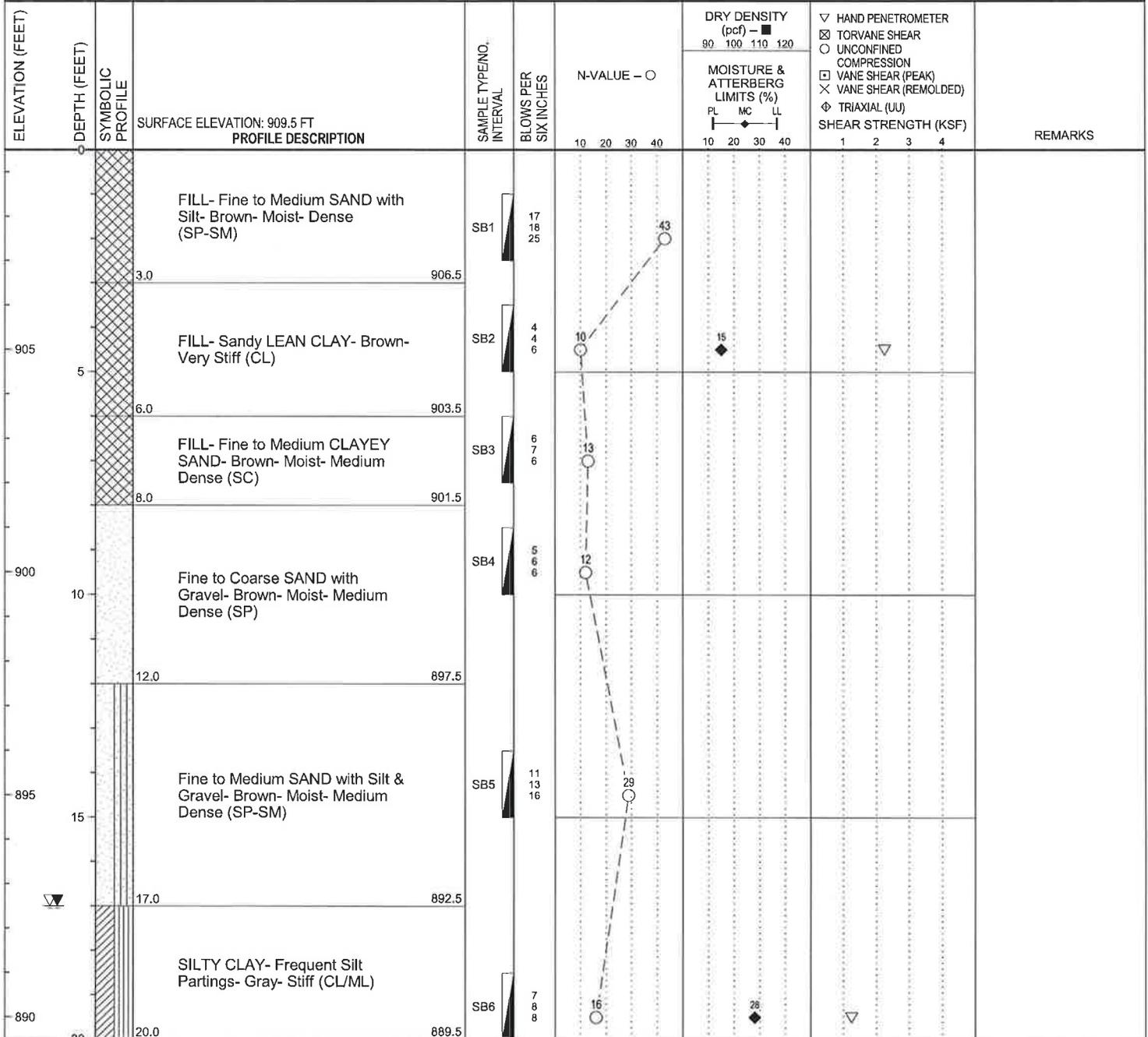
BORING METHOD: Solid-stem Augers

DRILLER: JR

RIG NO.: 253

LOGGED BY: JMK

CHECKED BY: ATB



END OF BORING AT 20.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ DURING BORING:	17.0	892.5
▽ AT END OF BORING:	17.0	892.5

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.



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GENERAL COMMENTS

Basis of Geotechnical Report

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing by our office.

The discussions and recommendations submitted in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in the soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME should be contacted to reevaluate the recommendations of this report. SME should be retained to continue our services through construction to observe and evaluate the actual subsurface conditions relative to the recommendations made in this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

Review of Design Details, Plans, and Specifications

SME should be retained to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

Review of Report Information With Project Team

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

Field Verification of Geotechnical Conditions

SME should be retained to verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

Project Information for Contractor

This report and any future addenda or other reports regarding this site should be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor should promptly describe the nature and extent of the differing conditions in writing and SME should be notified so that we can verify those conditions. The construction contract should include provisions for dealing with differing conditions and contingency funds should be reserved for potential problems during earthwork and foundation construction. We would be pleased to assist you in developing the contract provisions based on our experience.

The contractor should be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site should be made available for review by bidders and the successful contractor.

Third Party Reliance/Reuse of This Report

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.

LABORATORY TESTING PROCEDURES

Visual Engineering Classification

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

Moisture Content

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110° C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

Hand Penetrometer Tests

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

Torvane Shear Tests

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

Loss-on-Ignition (Organic Content) Tests

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440° C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

Atterberg Limits Tests

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a 1/2-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool 1/2 inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.

GENERAL CONDITIONS

Table of Articles:

1. Contract documents
2. Engineer
3. Owner
4. Contractor
5. Subcontractors
6. Separate contracts
7. Miscellaneous Provisions
8. Time
9. Payments and Completion
10. Protection of Persons and Property
11. Insurance
12. Changes in the work
13. Uncovering and correction of work
14. Termination of the contract

BID PROPOSAL FORM

FIRM NAME: _____

FOR: PROPOSAL "GC" GENERAL CONSTRUCTION

TO: _____

PROPOSAL: The undersigned, having familiarized (himself)(themselves) with the local conditions affecting the cost of the work and with the Contract Documents, including Invitation for Bids, Instructions to Bidders, General Conditions, Miscellaneous Requirements of Labor Standards and Prohibition of Discrimination, Miscellaneous Requirements of Division 1, the Form of proposal, Form of Plans, Drawings and Specifications, Addenda, and Exhibits issued and attached to the Specifications on file in the office of The Engineer Proposes to perform everything required to be performed and also to provide and furnish all of the labor, materials, necessary tools, equipment, and all utility and transportation services, etc., necessary to perform and complete in a workman like manner all of the work required under Proposal "GC", including Addenda issued thereto for the sums stipulated below. The said total amount shall constitute the Base Bid.

In submitting this bid, it is understood that the right is reserved by the Owner to reject any or all Bids and waive any informalities therein, deemed to be in the best interest of the Owner. If written notice of the acceptance of this Bid is mailed, telegraphed, or delivered to the undersigned within thirty (30) days after the opening thereof, the undersigned agrees to execute and deliver a Contract in the prescribe form and furnish the required bond(s) within ten (10) days after the notification of the award of the Contract to the undersigned and begin construction within seven (7) days from the date the undersigned has delivered the contract. The undersigned will fully complete all work there under, prior to October 1, 2014. Bidder, by submitting this Bid Proposal, agrees that time for completion of the Project shall be considered as of the essence, and in the case of acceptance of the Bid Proposal, the Owner shall incorporate the further provision that the Owner shall be entitled to the fixed sum of Five Hundred (\$500.00) dollars per day as liquidated damages for each and every day's delay in the completion of the work beyond the time fixed in the Contract and not caused by the Owner.

PROPOSAL "GC": GENERAL CONSTRUCTION

Building and Appendages:

_____ (\$ _____)

Bituminous Paving:

_____ (\$ _____)

Ventilation and Electrical:

_____ (\$ _____)

Total All-Inclusive Base Bid Proposal "GC"

_____ (\$ _____)

Alternate 1: Add the lean-to structure on the west side of the building in its entirety.

_____ (\$ _____)

**Alternate 2: Add the lean-to structure on the east side of the building in its entirety.
Include concrete wall at column line 3 and concrete slab-on-grade.**

_____ (\$ _____)

Alternate 3: Reduce overall length of building from 155' to 140'.

Deduct _____ (\$ _____)

Acceptance

The bidder understands that the Owner reserves the right to reject any or all bids and to waive any informality in the bidding.

The Bidder agrees that this bid shall be valid and may not be withdrawn for a period of thirty (30) calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of acceptance of this bid, the Bidder will execute the formal contract and deliver a Surety Bond or Bonds as required by the General Conditions within ten days.

Bidder acknowledges receipt of the following addendum:

(# _____) (# _____) (# _____) (# _____) (# _____) (# _____)

The bid security in the sum of:

_____ (\$ _____),
is to become the property of the Owner in the event the Contract and bonds are not
executed within the time set forth, as liquidated damages for the delay and additional
expense to the Owner caused thereby.

FIRM NAME: _____

BY: _____
(Signature) (Type or print name here)

TITLE: _____

ADDRESS OF FIRM: _____

TELEPHONE NUMBER: _____

DATE: _____

ARTICLE 1 - CONTRACT DOCUMENTS

1.01 CONTRACT DOCUMENTS

A. Contract Documents: The contract documents consist of the Agreement, the Conditions of the Contract (General, Supplementary, and other Conditions), the Drawings, the Specifications, all Addenda issued prior to execution of the Contract, and all Modifications thereto such as Change Orders.

B. Contract: The contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the bidding documents. The Contract may be amended or modified only by a Modification.

C. Work: The term Work includes all labor necessary to produce the construction required by the Contract Documents and all materials and equipment incorporated or to be incorporated in such construction.

D. Project: The Project is the total construction designed by the Engineer of which the Work performed under the Contract Documents may be the Whole or a part.

1.02 EXECUTION, CORRELATION, INTENT, AND INTERPRETATIONS

By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment, and other items necessary for the proper execution and completion of the Work. It is not intended that the Work not covered under any heading, section, branch, class, or trade of the Specifications shall be supplied unless it is required elsewhere in the Contract Documents or is reasonably inferable therefrom as being necessary to produce the intended results. Words which have well-known technical or trade meanings are used herein in accordance with such recognized meanings.

The organization of the Specification into divisions, sections, and articles, and the arrangement of Drawings shall not be a decisive factor for the Contractor dividing the Work among Subcontractors or establishing the extent of work to be performed by any trade.

Written interpretations necessary for the proper execution of progress of the Work, in the form of Drawings or otherwise, will be issued with reasonable promptness by the engineer and in accordance with any schedule agreed upon. Either party to the Contract may make written request to the Engineer for such interpretations. Such interpretations shall be consistent with and reasonable

inferable from the Contract Documents and may be effected by Field Order.

1.03 COPIES FURNISHED

Unless otherwise provided in the Contract Documents, the Contractor will be furnished free of charge all copies of Drawings and Specifications reasonably necessary for the execution of the Work.

All Drawings, Specifications, and copies thereof furnished by the Engineer are and shall remain his property. They are not to be used on any other project and, with the exception of one contract set for each party to the Contract, are to be returned to the Engineer on request at the completion of the Work.

ARTICLE 2 - ENGINEER

2.01 DEFINITION

The Engineer is the Engineer of the Calhoun County Road Department and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Engineer means the Engineer or his authorized representative.

Nothing contained in the Contract Documents shall create any contractual relationship between the Engineer and the Contractor.

2.02 ADMINISTRATION OF CONTRACT

The Engineer will provide general Administration of the Construction Contract, including performance of the functions hereinafter described.

The Engineer will be the Owner's representative during construction and until final payment. The Engineer will have authority to act on behalf of the Owner to the extent provided in the Contract Documents, unless otherwise modified by written instrument which will be shown to the Contractor.

The Engineer will advise and consult with the Owner, and all of the Owner's instructions to the Contractor shall be issued through the Engineer.

The Engineer shall, at all times, have access to the Work whenever it is in preparation and progress. The Contractor shall provide facilities for such access so the Engineer may perform his functions under the Contract Documents.

The Engineer will be, in the first instance, the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder by both the Owner and Contractor. The Engineer will, within a reasonable time, render such interpretations as he may deem necessary for the proper execution or progress of the Work.

Claims, disputes, and other matters in question between the Contractor and the Owner relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be referred initially to the Engineer for decision which he will render in writing within a reasonable time.

All interpretations and decisions of the Engineer shall be consistent with the intent of the Contract Documents. In his capacity as interpreter and judge, he will exercise his best efforts to ensure faithful performance by both the Owner and the Contractor and will not show partiality to either.

ARTICLE 3 - OWNER

3.01 DEFINITION

The Owner is the Calhoun County Road Department and is referred to throughout the Contract Documents as in singular in number and masculine in gender. The term Owner means the Owner or his authorized representative.

3.02 OWNER'S RIGHT TO STOP WORK

If the Contractor fails to correct defective Work or persistently fails to supply materials or equipment in accordance with the Contract Documents, the Owner may order the Contractor to stop Work, or any portion thereof until the cause for such order has been eliminated.

3.03 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision of the Contract, the Owner may, after seven days written notice to the Contractor and without prejudice to any other remedy he may have, make good such deficiencies. In such case, an appropriate Change Order shall be issued deducting from the payment due to the Contractor the cost of correcting such deficiencies, including the cost of the Engineer's additional services made necessary by such default, neglect, or failure. The Engineer must approve both such action and the amount charged to the Contractor. If any payment due the Contractor is not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

ARTICLE 4 - CONTRACTOR

4.01 DEFINITION

The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

4.02 REVIEW OF THE CONTRACT DOCUMENTS

The Contractor shall carefully study and compare the contract Documents and shall at once report to the Engineer any error, inconsistency, or omission he may discover.

4.03 SUPERVISION AND CONSTRUCTION PROCEDURES

The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work under the Contract.

4.04 LABOR AND MATERIALS

Unless otherwise specifically noted, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion for the Work.

4.05 WARRANTY

The Contractor warrants to the Owner and the Engineer that all materials and equipment furnished under this Contract will meet all Specifications set forth in this proposal or implied herein and be new unless otherwise specified, and that all Work will be of good quality, free from faults, and defects, and in conformance with the Contract Documents. All Work not so conforming to these standards may be considered defective. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

4.06 TAXES

The Contractor shall pay all sales, consumer, use, and other similar taxes required by law.

4.07 PERMITS, FEES, AND NOTICES

The Contractor shall secure and pay for all permits, governmental fees, and licenses necessary for the proper execution and completion of the Work, which are applicable at the time the bids are received.

The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and orders of any public authority bearing on the performance of the Work. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted by appropriate modification. If the Contractor performs any Work knowing to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the Engineer, he shall assume full responsibility therefore and shall bear all costs attributable thereto.

4.08 SUPERINTENDENT

The Contractor shall employ a competent superintendent and necessary assistant to be in attendance at the project site during the progress of the Work. The superintendent shall be capable of maintaining a satisfactory relationship with the Engineer. The superintendent shall not be replaced except with the consent of the Engineer, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor and all communications given to the superintendent shall be binding as if given to the Contractor. Important communications will be confirmed in writing. Other communications will be so confirmed on written request in each case.

4.09 RESPONSIBILITY FOR THOSE PERFORMING THE WORK

The Contractor shall be responsible to the Owner for the acts and omission of all his employees and all Subcontractors, their agents and employees, and all other persons performing any of the Work under a contract with the Contractor.

4.10 PROGRESS SCHEDULE

The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Engineer's approval an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents. This schedule shall indicate the dates for the starting and completion of the various stages of construction and shall be revised as required by the conditions of the Work, subject to the Engineer's approval.

4.11 DRAWINGS AND SPECIFICATIONS AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of all Drawings, Specifications,

Addenda, approved Shop Drawings, Change Orders, and other Modification, in good order and marked to record all changes made during construction. These shall be available to the Engineer. The Drawing, marked to record all changes made during construction, shall be delivered to him for the Owner upon completion of the Work.

4.12 SHOP DRAWINGS AND SAMPLES

Shop Drawings are drawings, diagrams, illustrations, schedules, performance start, brochures, and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier, or distributor, and which illustrate some portion of the Work.

Samples are physical examples furnished by the Contractor to illustrate materials, equipment, or workmanship, and to establish standards by which the Work will be judged.

The Contractor shall review, stamp with his approval, and submit, with reasonable promptness and in orderly sequences so as to cause no delay in the Work or in the Work of any other Contractor, all Shop Drawings and Samples required by the Contract Documents.

By approving and submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers, and similar data, or will do so, and that he has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and of the Contract Documents.

The Engineer will review and approve Shop Drawings and Samples with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Engineer's approval of a separate item shall not indicate approval of an assembly in which the item functions.

The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected copies of Shop drawings or new Samples until approved. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Engineer on previous submissions.

The Engineer's approval of Shop Drawings or Samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation, nor shall the Engineer's approval relieve the Contractor from responsibility for errors or omissions in the Shop Drawings or Samples.

No portion of the Work requiring a Shop Drawing or Sample submission shall be commenced until the submission has been approved by the Engineer. All such portions of the Work shall be in accordance with approved Shop Drawings and Samples.

4.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.14 CUTTING AND PATCHING OF WORK

The Contractor shall do all cutting, fitting, or patching of his Work that may be required to make its several parts fit together properly, and shall not endanger any Work by cutting, excavating, or otherwise altering the Work or part of it.

4.15 CLEANING UP

The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work he shall remove all his waste materials, and rubbish from and about the Project as well as all his tools, construction equipment, and machinery, and surplus materials and leave the Work "broom clean" or its equivalent, except as otherwise specified.

If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be charged to the Contractor.

4.16 INDEMNIFICATION

The Contractor shall indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from the performance of the Work provided that any such claim, damage, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and (2) is caused in whole or part by any negligent act or omission of the Contractor, any Subcontractor or any one directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

In any and all claims against the Owner or the Engineer or any of their agents or employees by an employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts, or other employee benefit acts. The obligations of the Contractor shall not extend to the liability of the Engineer, his agents, or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or Specifications.

4.17 NONDISCRIMINATION

A. For all state contracts for goods or services in amount of \$5,000.00 or more, or for contracts entered into with parties employing three or more employees: In connection with the performance of Work under this contract, the Contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, national origin, age* or sex*.

The Contractor will take affirmative action to insure that applicants are employed and that employees are treated during employment, without regard to their race, religion, color, national origin, age*, or sex*. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2. 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 race, religion, color, national origin, age* or sex*.
3. The Contractor -- or his collective bargaining representative -- will send a notice advising each respective labor union -- or worker's representative -- under which there exists a collective bargaining agreement of other contract of understanding, of the Contractor=s commitments under this section.
4. The Contractor will comply with all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission relevant to Section 4, Act No. 251, Public Acts of 1955, as amended, which may be in effect prior to the taking of bids for any individual state project.

* Section 3a(a), Act No. 344, Public Acts of 1965, as amended by Act 349, Public Acts of 1966, reads:

“It is an unfair employment practice:

(a) For any employer, because any individual is between the ages of 35 and 60, or because of the sex of any individual, to refuse to hire or otherwise to discriminate against that individual with respect to hire, tenure, terms, conditions or privileges of employment. Any such refusal to hire or discriminate shall not be an unfair employment practice if based on law, regulation, the requirements of any federal or state training or employment program or on a bona fide occupational qualification and except in selecting individuals for an apprentice program or an on -the-job training program intended to have duration of more than 4 months.”

5. The Contractor will furnish and file compliance reports within such time and upon such forms as provided by the Michigan Civil Rights Commission: and employment statistics of each Subcontractor as well as the contractor himself, and said contractor will permit access to his books, records, and accounts by the Michigan Civil Rights Commission, and /or its agent, for the purpose of investigation to ascertain compliance with this contract and with rules,

regulations, and orders of the Michigan Civil Rights Commission relevant to Section 4, Act No. 251, Public Acts of 1955, as amended.

6. In the event that the Civil Rights Commission finds, after a hearing held pursuant to its rules, that a contractor has not complied with the contractual obligations under the agreement, the Civil Rights Commission may, as part of its order based upon findings, certify said finding to the Administrative Board of the State of Michigan, which Administrative Board may order the cancellation of the Contract found to have been violated, and/ or declare the contractor ineligible of future contracts with the state and its political and civil subdivisions, departments, and officers, and including the governing boards of institution of higher education., until the contractor complies with said order of the Civil Rights Commission. Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the contractor is declared ineligible to contract as a contracting party in future contracts. In any case before the Civil Rights Commission in which cancellation of an existing contract is a possibility, the contracting agency shall be notified of such possible remedy and shall be given, the option by the Civil Rights Commission to participate in such proceedings.
7. The contractor will include, or incorporate by reference, the provisions of the foregoing paragraph (1) through (6) in every subcontract or purchase order unless exempted by the rules, regulations or orders of the Michigan Civil Rights Commission,** and will provide in every subcontract or purchase order that said provisions will be binding upon each subcontractor or seller.

B. For all state contracts for goods or services in an amount of less than \$5,000, or for contracts entered into with parties employing less than three employees: The contractor, pursuant to the requirements of Act No. 251, Public Acts of the State of Michigan of 1955, and as amended by Act No. 344, Public Acts of 1965 and Act No. 349,. Public Acts of 1966 agrees not to discriminate against any employee or applicant for employment, to be employed in the performance of this contract, with respect to his hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of his race, color, religion, national origin, ancestry, age or sex. The contractor further agrees that every subcontract entered in to for the performance of this contact will contain a provision requiring nondiscrimination in employment, as herein specified, binding upon each subcontractor. Breach of this covenant may be regarded as a material breach of the contract.

**Except for those subcontracts (1)for goods or services in any amount of less than \$5,000;(2) entered into with parties employing less than three employees.

4.18 PREVAILING WAGE AND FRINGE BENEFIT RATES

The rates of wages and fringe benefits to be paid to each class of trade by the bidder and all of his subcontractors shall be not less than the wage and fringe benefit rates prevailing in the locality in which the work is to be performed, in accordance with Act No. 166, Public Acts of 1965. For wage determinations, Call Department of Consumer and Industry Services, Wage Hour Division @ (517)

322-6723.

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 the contract and- shall keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each worker employed by him in connection with said contract. This record shall be available for reasonable inspection by the Bureau of Facilities, Department of Management and Budget, or the Department of Labor.

The State, by written notice to the Contractor and the sureties of the Contractor known to the State, may terminate the Contractor's right to proceed with that part of the contract for which less than the prevailing rates of wages and fringe benefits have been or will be paid, and may proceed to complete the contract by separate agreement with another Contractor or otherwise, and the original contractor and his sureties shall be liable to the State for any excess costs occasioned thereby. Any person, firm or corporation or combination thereof, including the officers of any contracting agent, violation the provisions of the act is guilty of a misdemeanor.

In case there is an omission of any trade from the list of wage rates and fringe benefits to be paid to each class of trade by the Contractor, it shall be understood that the trades omitted shall also be paid not less than the wage and fringe benefit rates prevailing in the locality in which the work is to be performed.

ARTICLE 5 - SUBCONTRACTORS

5.01 DEFINITION

A Subcontractor is a person or organization who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

A Sub-contractor is a person or organization who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contractor Documents as if singular in number and masculine in gender and means a Subcontractor or an authorized representative thereof.

5.02 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF WORK

Unless otherwise specified in the Contract Documents or in the Instructions to Bidders, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Engineer in writing for acceptance by the Owner and the Engineer a list of the names of the Subcontractor's proposed for the principal portions of the Work. The Engineer shall promptly notify the Contractor in writing if either the Owner or the Engineer, after due investigation, has reasonable objection to any Subcontractor on such list and does not accept him. Failure of the Owner or Engineer to make objection promptly to any Subcontractor on the list shall constitute acceptance of such Subcontractor.

5.03 PAYMENTS TO SUBCONTRACTORS

The Contractor shall pay each Subcontractor, before receipt of final payment from the Owner. The Contractor shall also require each Subcontractor to make similar payments to his subcontractor.

ARTICLE 6 - SEPARATE CONTRACTS

6.01 OWNER'S RIGHT TO AWARD SEPARATE CONTRACTS

The Owner reserves the right to award other contracts in connection with other portions of the Project under these or similar Conditions of the Contract.

When separate contracts are awarded for different portions of the Project, “the Contractor” in the Contract Documents in each case shall be the Contractor who signs each separate Contract.

6.02 MUTUAL RESPONSIBILITY OF CONTRACTORS

The Contractors shall afford other contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate his Work with theirs.

If any part of the Contractor's Work depends upon the proper execution or the results of the work of any other separate contractor, the Contractor shall inspect and promptly report to the Engineer any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results.

ARTICLE 7 - MISCELLANEOUS PROVISIONS

7.01 GOVERNING LAW

The Contract shall be governed by the law of the local where the Project is located.

7.02 SUCCESSORS AND ASSIGNS

The Owner and the Contractor each binds himself, his partners, successors, assigns, and legal representatives to the other party hereto and to the partners, successors, assigns, and legal representatives of such other party in respect to all covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due or to become due to him hereunder without the previous written consent of the Owner.

7.03 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

The Owner shall have the right to require the Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder if and as required in the Instructions to Bidders of elsewhere in the Contract Documents.

7.04 ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process, or the product of a particular manufacturer or manufactures is specified, but if the Contractor has reason to believe that the design, process, or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

7.05 TESTS

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any Work to be inspected, tested, or approved, the Contractor shall give the Engineer timely notice of its readiness and of the date arranged so the Engineer may observe such inspection, testing, or approval. The Contractor shall bear all costs of such inspections, tests, and approvals unless otherwise provided.

If after the commencement of the Work the Engineer determines any Work requires special inspection, testing, or approval, he will, upon written authorization from the Owner, instruct the

Contractor to order such special inspection, testing, or approval and the Contractor shall give notice as specified above. If such special inspection or testing reveals a failure of the Work to comply: (1) with the requirements of the Contract Documents, or (2) with respect to the performance of the Work with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof, including the Engineer's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

Required certificates of inspection, testing, or approval shall be secured by the Contractor and promptly delivered by him to the Engineer.

7.06 ARBITRATION

All claims, disputes, and other matters in question arising out of or relating to this Contract or the breach thereof, except for claims which have been waived by the making or acceptance of final payment as provided by Paragraph 9.06, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association unless the parties mutually agree otherwise. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

The Contractor shall carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise agreed by him and the Owner in writing.

ARTICLE 8 - TIME

8.01 DEFINITION

The Contract Time is the period of time allotted in the Contract Documents for completion of the Work.

The Date of Commencement of the Work is the date established in a notice to proceed. If there is not notice to proceed, it shall be the date of the Agreement or such other date as may be established therein.

8.02 PROGRESS AND COMPLETION

All time limits stated in the Contract Documents are of the essence of the Contract.

The Contractor shall begin the Work on the date of commencement as defined in Paragraph 8.01. He shall carry the Work forward expeditiously with adequate forces and shall complete it within the Contract Time.

8.03 DELAYS AND EXTENSIONS OF TIME

If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or the Engineer, or by any employee of either, or by any separate Contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by any cause which the Engineer determines may justify the delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Engineer may determine.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.01 CONTRACT SUM

The Contract Sum is stated in the Agreement and is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.02 SCHEDULE OF VALUES

No Schedule of Value is required and no final payment will be made until the completed structure is accepted by the Owner and the Engineer.

9.03 PROGRESS PAYMENTS

Three Progress Payments will be made.

9.04 CERTIFICATES FOR PAYMENT

If the Contractor has made Application for Payment as above, the Engineer will, with reasonable promptness after the receipt of the Application, issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as he determines to be properly due, or state in writing his reasons for withholding a certificate as provided in Paragraph 9.05.

After the Engineer has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Agreement.

No certificate for payment, nor any payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

9.05 PAYMENTS WITHHELD

The Engineer may decline to approve an Application for Payment and may withhold his Certificate in whole or in part, to the extent necessary reasonably to protect the Owner, if in his opinion he is unable to make representations to the Owner as provided in Paragraph 9.04. The Engineer may also decline to approve any Applications for Payment or, because of subsequently discovered evidence or subsequent inspections, he may nullify the whole or any part of any Certificate for Payment previously issued to such extent as may be necessary in his opinion to protect the Owner from loss because of:

1. Defective work not remedied;

2. Third-party claims filed or reasonable evidence indicating probable filing of such claims;
3. Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
4. Reasonable doubt that the Work can be completed for the unpaid balance of the Contract Sum;
5. Damage to another contractor;
6. Reasonable indication that the Work will not be completed within the Contract Time; or
7. Unsatisfactory prosecution of the Work by the Contractor.

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

9.06 SUBSTANTIAL COMPLETION AND FINAL PAYMENT

When the Engineer determines that the Work or a designated portion thereof acceptable to the Owner is substantially complete, the Engineer shall prepare for submission to the Contractor a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Upon notice that the Work is ready for final inspection and acceptance, the Engineer will promptly make such inspection, and when he finds the Work acceptable under the Contract Documents and the Contract fully performed, he will promptly issue a Certificate for Payment stating that to the best of his knowledge, information, and belief, and on the basis of his observations and inspection, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, and noted in said Certificate is due and payable.

The final payment shall not become due until the Contractor submits to the Engineer: (1) an Affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied; (2) consent of surety, if any, to final payment; and (3) if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases, and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any such lien. If any such liens remain unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

1. Unsettled liens;
2. Faulty or defective Work appearing after Substantial Completion;
3. Failure of the work to comply with the requirements of the Contract Documents;
4. Terms of any special guarantees required by the Contract Documents;
5. All applicable Certificates of Inspection required by authorities having jurisdiction;
6. All guarantees; or
7. As-built drawings.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.01 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs. in connection with the Work

10.02 SAFETY OF PERSONS AND PROPERTY

The Contractor shall take all reasonable precautions for the safety of, and supervision of all safety precautions and programs in connection with the Work, including:

1. All employees on the Work site and all other persons who may be affected thereby;
2. All Work and all materials and equipment to be incorporate therein, whether in storage on or off the site, under the care, custody, or control of the contractor or any of his Subcontractors or Sub-subcontractors; and
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities.

All damage or loss to any property caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable shall be remedied by the Contractor.

The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.03 EMERGENCIES

In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work.

ARTICLE 11 - INSURANCE

11.01 CONTRACTOR'S LIABILITY

The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose act any of them may be liable. Limits of such insurance shall not be less than \$500,000 combined single limit per occurrence:

1. Claims under workmen's compensation, disability benefit, and other similar employee benefit acts;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
3. Claims for damages because of bodily injury, sickness, or disease, or death of any person other than his employees;
4. Claims for damages insured by usual personal injury liability coverage which are sustained:
 - a) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or b) by any other person; and
5. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from.

The limits of public liability insurance for each Contractor shall be at least \$500,000 for injury to any one person and at least \$1,000,000 for injuries to more than one person in any one accident or occurrence.

Property damage limits shall be not less than \$500,000 for each accident and aggregate amount of \$1,000,000.

Each Contractor shall maintain Contractor's Protective Public Liability and Property Damage Insurance, limits not less than \$500,000 for each person and \$1,000,000 for each accident or furnish certificates showing that each subcontractor is protected in the amounts given above for public liability and property damage.

Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled until at least fifteen days prior written notice has been given to the Owner.

11.02 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining his own liability insurance and, at his option, may purchase and maintain such insurance as will protect him against claims which may arise from operations under the Contract.

11.03 PROPERTY INSURANCE

Unless otherwise provided, 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, Subcontractor, and Sub-subcontractors in the Work and shall insure against the perils of Fire, Extended Coverage, Vandalism, and Malicious Mischief. The Contractor shall file a copy of all policies with the Owner before an exposure to loss may occur.

The Contractor shall purchase and maintain such insurance as may be required by the Contract Documents or by law. This insurance shall include the interests of the Owner, the Contractor, Subcontractors, and Sub-subcontractors in the Work.

Any insured loss is to be adjusted with the Owner and made payable to the Owner as Trustee for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause.

ARTICLE 12 - CHANGES IN THE WORK

12.01 CHANGE ORDERS

The Owner, without invalidating the Contract, may order Changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such Changes in the Work shall be authorized by Change Order and shall be executed under the applicable conditions of the Contract Documents.

The cost or credit to the Owner resulting from a Change in the Work shall be determined in one or more of the following ways:

1. By mutual acceptance of a lump sum properly itemized;
2. By unit prices stated in the Contract Documents or subsequently agreed upon; or
3. By cost and a mutually acceptable fixed or percentage fee.

12.02 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Engineer written notice thereof within 20 days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Subparagraph 10.03. No such claim shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by the Engineer. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.03 MINOR CHANGES IN THE WORK

The Engineer shall have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be binding on the Owner and the Contractor.

12.04 FIELD ORDERS

The Engineer may issue written Field Orders which interpret the Contract Documents which order minor changes in the Work in accordance with Paragraph 12.03 without change in Contract Sum or Contract Time. The Contractor shall carry out such Field Orders promptly.

ARTICLE 13 - UNCOVERING AND CORRECTION OF WORK

13.01 UNCOVERING OF WORK

If any Work should be covered contrary to the request of the Engineer, it must, if required by the Engineer, be uncovered for his observation and replace at the Contractor's expense.

If any other Work has been covered which the Engineer has not specifically required to observe prior to being covered, the Engineer may request to see such Work and it shall be uncovered by the Contractor. If such Work is found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it is found that this condition was caused by a separate contractor employed as provided in Article 6, and in that event the Owner shall be responsible for the payment of such costs.

13.02 CORRECTION OR WORK

The Contractor shall promptly correct all Work rejected by the Engineer as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. The Contractor shall bear all cost of correcting such rejected Work, including the cost of the Engineer's additional services thereby made necessary.

If, within one year after the Date of Substantial Completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition.

All such defective or nonconforming Work shall be removed from the site if necessary, and the Work shall be corrected to comply with the Contract Documents without cost to the Owner.

The Contractor shall bear the cost of making good all work of separate contractors destroyed or damaged by such removal or correction.

If the Contractor fails to correct such defective or nonconforming Work, the Owner may correct it in accordance with Paragraph 3.03.

13.03 ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK

If the Owner prefers to accept defective or nonconforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in the Contract Sum, or if the amount is determined after final payment, it shall be paid by the Contractor.

ARTICLE 14 - TERMINATION OF THE CONTRACT

14.01 TERMINATION BY THE CONTRACTOR

If the Work is stopped for a period of 30 days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as declaration of national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon seven days give written notice to the Owner and the Engineer, terminate the Contract and recover from the Owner payment for all Work executed and for any proved loss sustained upon any materials, equipment, tools, and construction equipment and machinery, including reasonable profit and damages.

14.02 TERMINATION BY THE OWNER

If the Contractor is adjusted as bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workman or proper materials, or if he fails to make prompt payment to Subcontractors for materials or labor, or persistently, disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, otherwise is guilty of a substantial violation of a provision of the Contract documents, then the Owner, upon certification by the Engineer that sufficient cause exists to justify such action, may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, seven days: written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, contract equipment and machinery thereon owned by the Contractor and may finish the Work by whatever methods he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished.

If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Engineer's additional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The costs incurred by the Owner as herein provided shall be certified by the Engineer.



RICK. SNYDER
GOVERNOR



STATE OF MICHIGAN

Prevailing Wages
PO Box 30476
Lansing, MI 48909
517-322-1825

Informational Sheet: Prevailing Wages on State Projects

REQUIREMENTS OF THE PREVAILING WAGES ON STATE PROJECTS ACT, PUBLIC ACT 166 OF 1965

The State of Michigan determines prevailing rates pursuant to the Prevailing Wages on State Projects Act, Public Act 166 of 1965, as amended. The purpose of establishing prevailing rates is to provide minimum rates of pay that must be paid to workers on construction projects for which the state or a school district is the contracting agent and which is financed or financially supported by the state. By law, prevailing rates are compiled from the rates contained in collectively bargained agreements which cover the locations of the state projects. The official prevailing rate schedule provides an hourly rate which includes *wage and fringe benefit totals* for designated construction mechanic classifications. The overtime rates also include *wage and fringe benefit totals*. Please pay special attention to the overtime and premium pay requirements. Prevailing wage is satisfied when wages plus fringe benefits paid to a worker are equal to or greater than the required rate.

State of Michigan responsibilities under the law:

- The department establishes the prevailing rate for each classification of construction mechanic **requested by a contracting agent** prior to contracts being let out for bid on a state project.

Contracting agent responsibilities under the law:

- If a contract is not awarded or construction does not start within 90 days of the date of the issuance of rates, a re-determination of rates must be requested by the contracting agent.
- Rates for classifications needed but not provided on the Prevailing Rate Schedule, **must** be obtained **prior** to contracts being let out for bid on a state project.
- The contracting agent, by written notice to the contractor and the sureties of the contractor known to the contracting agent, may terminate the contractor's right to proceed with that part of the contract, for which less than the prevailing rates have been or will be paid, and may proceed to complete the contract by separate agreement with another contractor or otherwise, and the original contractor and his sureties shall be liable to the contracting agent for any excess costs occasioned thereby.

Contractor responsibilities under the law:

- Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing rates prescribed in a contract.
- Every contractor and subcontractor shall keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each construction mechanic employed by him in connection including certified payroll, as used in the industry, with said contract. This record shall be available for reasonable inspection by the contracting agent or the department.
- Each contractor or subcontractor is separately liable for the payment of the prevailing rate to its employees.
- The prime contractor is responsible for advising all subcontractors of the requirement to pay the prevailing rate prior to commencement of work.
- The prime contractor is secondarily liable for payment of prevailing rates that are not paid by a subcontractor.
- A construction mechanic *shall only* be paid the apprentice rate if registered with the United States Department of Labor, Bureau of Apprenticeship and Training and the rate is included in the contract.

Enforcement:

A person who has information of an alleged prevailing wage violation on a state project may file a complaint with the State of Michigan. The department will investigate and attempt to resolve the complaint informally. During the course of an investigation, if the requested records and posting certification are not made available in compliance with Section 5 of Act 166, the investigation will be concluded and a referral to the Office of Attorney General for civil action will be made. The Office of Attorney General will pursue costs and fees associated with a lawsuit if filing is necessary to obtain records.



RICK. SNYDER
GOVERNOR

STATE OF MICHIGAN

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Lansing, MI 48909
517-322-1825



Informational Sheet: Prevailing Wages on State Projects

General Information Regarding Fringe Benefits

Certain fringe benefits **may** be credited toward the payment of the Prevailing Wage Rate:

- If a fringe benefit is paid directly to a construction mechanic
- If a fringe benefit contribution or payment is made on behalf of a construction mechanic
- If a fringe benefit, which may be provided to a construction mechanic, is pursuant to a written contract or policy
- If a fringe benefit is paid into a fund, for a construction mechanic

When a fringe benefit is not paid by an hourly rate, the hourly credit will be calculated based on the annual value of the fringe benefit divided by 2080 hours per year (52 weeks @ 40 hours per week).

The following is an example of the types of fringe benefits allowed and how an hourly credit is calculated:

Vacation	40 hours X \$14.00 per hour = \$560/2080 =	\$0.27
Dental insurance	\$31.07 monthly premium X 12 mos. = \$372.84 /2080 =	\$0.18
Vision insurance	\$5.38 monthly premium X 12 mos. = \$64.56/2080 =	\$0.03
Health insurance	\$230.00 monthly premium X 12 mos. = \$2,760.00/2080 =	\$1.33
Life insurance	\$27.04 monthly premium X 12 mos. = \$324.48/2080 =	\$0.16
Tuition	\$500.00 annual cost/2080 =	\$0.24
Bonus	4 quarterly bonus/year x \$250 = \$1000.00/2080 =	\$0.48
401k Employer Contribution	\$2000.00 total annual contribution/2080 =	\$0.96
Total Hourly Credit		<u>\$3.65</u>

Other examples of the types of fringe benefits allowed:

- Sick pay
- Holiday pay
- Accidental Death & Dismemberment insurance premiums

The following are examples of items that **will not** be credited toward the payment of the Prevailing Wage Rate

- Legally required payments, such as:
 - Unemployment Insurance payments
 - Workers' Compensation Insurance payments
 - FICA (Social Security contributions, Medicare contributions)
- Reimbursable expenses, such as:
 - Clothing allowance or reimbursement
 - Uniform allowance or reimbursement
 - Gas allowance or reimbursement
 - Travel time or payment
 - Meals or lodging allowance or reimbursement
 - Per diem allowance or payment
- Other payments to or on behalf of a construction mechanic that are not wages or fringe benefits, such as:
 - Industry advancement funds
 - Financial or material loans



State of Michigan
 DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
 MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
 MARTHA B. YODER
 DIRECTOR

OVERTIME PROVISIONS for MICHIGAN PREVAILING WAGE RATE COMMERCIAL SCHEDULE

- Overtime is represented as a nine character code. Each character represents a certain period of time after the first 8 hours Monday thru Friday.

	Monday thru Friday	Saturday	Sunday & Holidays	Four 10s
First 8 Hours		4	8	9
9th Hour	1	5		
10th Hour	2	6		
Over 10 hours	3	7		

Overtime for Monday thru Friday after 8 hours:

the 1st character is for time worked in the 9th hour (8.1 - 9 hours)
 the 2nd character is for time worked in the 10th hour (9.1 - 10 hours)
 the 3rd character is for time worked beyond the 10th hour (10.1 and beyond)

Overtime on Saturday:

the 4th character is for time worked in the first 8 hours on Saturday (0 - 8 hours)
 the 5th character is for time worked in the 9th hour on Saturday (8.1 - 9 hours)
 the 6th character is for time worked in the 10th hour (9.1 - 10 hours)
 the 7th character is for time worked beyond the 10th hour (10.01 and beyond)

Overtime on Sundays & Holidays

The 8th character is for time worked on Sunday or on a holiday

Four Ten Hour Days

The 9th character indicates if an optional 4-day 10-hour per day workweek can be worked **between Monday and Friday without paying overtime after 8 hours worked, unless otherwise noted in the rate schedule. To utilize a 4 ten workweek, notice is required from the employer to employee prior to the start of work on the project.**

- Overtime Indicators Used in the Overtime Provision:

H - means TIME AND ONE-HALF due
 X - means TIME AND ONE-HALF due after 40 HOURS worked
 D - means DOUBLE PAY due
 Y - means YES an optional 4-day 10-hour per day workweek can be worked without paying overtime after 8 hours worked
 N - means NO an optional 4-day 10-hour per day workweek *can not* be worked without paying overtime after 8 hours worked

- EXAMPLES:

HHHHHHHDN - This example shows that the 1½ rate must be used for time worked after 8 hours Monday thru Friday (characters 1 - 3); for all hours worked on Saturday, 1½ rate is due (characters 4 - 7). Work done on Sundays or holidays must be paid double time (character 8). The N (character 9) indicates that 4 ten-hour days is not an acceptable workweek at regular pay.

XXXHHHHDY - This example shows that the 1½ rate must be used for time worked after 40 hours are worked Monday thru Friday (characters 1-3); for hours worked on Saturday, 1½ rate is due (characters 4 – 7). Work done on Sundays or holidays must be paid double time (character 8). The Y (character 9) indicates that 4 ten-hour days is an acceptable alternative workweek.

LARA is an equal opportunity employer.
 Auxiliary aids, services and other reasonable accommodations are available upon request to individuals with disabilities.

ENGINEERS - CLASSES OF EQUIPMENT LIST

UNDERGROUND ENGINEERS

CLASS I

Backfiller Tamper, Backhoe, Batch Plant Operator, Clam-Shell, Concrete Paver (2 drums or larger), Conveyor Loader (Euclid type), Crane (crawler, truck type or pile driving), Dozer, Dragline, Elevating Grader, End Loader, Gradall (and similar type machine), Grader, Power Shovel, Roller (asphalt), Scraper (self propelled or tractor drawn), Side Broom Tractor (type D-4 or larger), Slope Paver, Trencher (over 8' digging capacity), Well Drilling Rig, Mechanic, Slip Form Paver, Hydro Excavator.

CLASS II

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

CLASS III

Air Compressors (600 cfm or larger), Air Compressors (2 or more less than 600 cfm), Boom Truck (non-swinging, non-powered type boom), Concrete Breaker (self-propelled or truck mounted, includes compressor), Concrete Paver (1 drum, ½ yard or larger), Elevator (other than passenger), Maintenance Man, Mechanic Helper, Pump (2 or more 4" up to 6" discharge, gas or diesel powered, excluding submersible pump), Pumpcrete Machine (and similar equipment), Wagon Drill Machine, Welding Machine or Generator (2 or more 300 amp or larger, gas or diesel powered).

CLASS IV

Boiler, Concrete Saw (40HP or over), Curing Machine (self-propelled), Farm Tractor (w/attachment), Finishing Machine (concrete), Firemen, Hydraulic Pipe Pushing Machine, Mulching Equipment, Oiler (2 or more up to 4", exclude submersible), Pumps (2 or more up to 4" discharge if used 3 hrs or more a day-gas or diesel powered, excluding submersible pumps), Roller (other than asphalt), Stump Remover, Vibrating Compaction Equipment (6' wide or over), Trencher (service) Sweeper (Wayne type and similar equipment), Water Wagon, Extend-a-Boom Forklift.

HAZARDOUS WASTE ABATEMENT ENGINEERS

CLASS I

Backhoe, Batch Plant Operator, Clamshell, Concrete Breaker when attached to hoe, Concrete Cleaning Decontamination Machine Operator, Concrete Pump, Concrete Paver, Crusher, Dozer, Elevating Grader, Endloader, Farm Tractor (90 h.p. and higher), Gradall, Grader, Heavy Equipment Robotics Operator, Hydro Excavator, Loader, Pug Mill, Pumpcrete Machines, Pump Trucks, Roller, Scraper (self-propelled or tractor drawn), Side Boom Tractor, Slip Form Paver, Slope Paver, Trencher, Ultra High Pressure Waterjet Cutting Tool System Operator, Vactors, Vacuum Blasting Machine Operator, Vertical Lifting Hoist, Vibrating Compaction Equipment (self-propelled), and Well Drilling Rig.

CLASS II

Air Compressor, Concrete Breaker when not attached to hoe, Elevator, End Dumps, Equipment Decontamination Operator, Farm Tractor (less than 90 h.p.), Forklift, Generator, Heater, Mulcher, Pigs (Portable Reagent Storage Tanks), Power Screens, Pumps (water), Stationary Compressed Air Plant, Sweeper, Water Wagon and Welding Machine.

State of Michigan

WHPWRequest@michigan.gov

Official Request #: 496

Requestor: MDOT

Project Description: City of Marshall - Build Salt Storage Facility

Project Number:

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

Issue Date: 4/2/2014

Contract must be awarded by: 7/1/2014

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<u>Classification</u>			Last Updated	Straight Time and Hourly	a Double Half Time	Overtime Provision
Name	Description					
Asbestos & Lead Abatement Laborer						
Asbestos & Lead Abatement Laborer	MLDC		8/14/2013	\$39.75	\$53.04	\$66.32 H H H X X X X D Y
4 ten hour days @ straight time allowed Monday-Saturday, must be consecutive calendar days						
 Asbestos & Lead Abatement, Hazardous Material Handler						
Asbestos and Lead Abatement, Hazardous Material Handler	AS207		9/16/2013	\$39.75	\$53.08	\$66.40 H H H X X X X D Y
4 ten hour days @ straight time allowed Monday-Saturday,						
 Boilermaker						
Boilermaker	BO169		8/14/2009	\$54.70	\$81.08	\$107.45 H H H H H H H D Y
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 #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Bricklayer				
Bricklayer, Block, Stone, Artificial and Marble Masonry, and Pointers,Cleaners and Caulkers	BR9-17-BL 3/7/2013	\$41.57	\$54.94	\$68.31 H H H H H H D Y
Apprentice Rates:				
0 - 749 hours		\$30.87	\$38.89	\$46.91
750 - 1,499 hours		\$32.21	\$40.90	\$49.59
1,500 - 2,249 hours		\$33.55	\$42.91	\$52.27
2,250 - 2,999 hours		\$34.89	\$44.92	\$54.95
3,000 - 3,749 hours		\$36.22	\$46.91	\$57.61
3,750 - 4,499 hours		\$37.56	\$48.93	\$60.29
4,500 - 5,249 hours		\$38.90	\$50.93	\$62.97
5,250 - 6,000 hours		\$40.23	\$52.93	\$65.63
Carpenter				
Floor Layer	CA-100FL 9/16/2013	\$37.71	\$48.16	\$58.60 X X H H H H D Y
Apprentice Rates:				
1st year		\$29.35	\$35.62	\$41.88
2nd year		\$31.44	\$38.75	\$46.06
3rd year		\$33.53	\$41.88	\$50.24
4th year		\$34.58	\$43.46	\$52.34
Carpenter	CA-525 9/30/2013	\$37.45	\$47.55	\$57.64 X X H H H H D Y
Apprentice Rates:				
1st year		\$29.37	\$35.42	\$41.48
2nd year		\$31.39	\$38.46	\$45.52
3rd year		\$33.41	\$41.48	\$49.56
4th year		\$34.42	\$43.00	\$51.58
Cement Mason				
Cement Mason	BR9-17-CM 3/8/2013	\$39.46	\$51.62	\$63.78 X X H X X X H D Y
Apprentice Rates:				
0 - 749 hours		\$30.95	\$38.86	\$46.76
750 - 1,499 hours		\$32.16	\$40.67	\$49.18
1,500 - 2,249 hours		\$33.38	\$42.50	\$51.62
2,250 - 2,999 hours		\$34.60	\$44.33	\$54.06
3,000 - 3,749 hours		\$35.81	\$46.14	\$56.48
3,750 - 4,499 hours		\$37.03	\$47.98	\$58.92

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Official 2014 Prevailing Wage Rates for State Funded Projects

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Classification Name Description	Last Updated	Straight Time and Hourly	Half	a Double Time	Overtime Provision
Cement Mason	PL16-5	\$35.14	\$46.30	\$57.45	H H H H H H D Y

10/23/2012

Four 10s allowed Monday-Thursday with Friday or Saturday inclement weather make up days. Saturday hours for inclement weather make up shall be paid straight rate unless over 40 hours worked.

Apprentice Rates:

1st year	\$27.33	\$34.58	\$41.83
2nd year	\$29.56	\$37.93	\$46.29
3rd year	\$31.79	\$41.27	\$50.75

Electrician

Road Way Electrical Work	EC-17	\$50.53	\$73.30	\$96.06	H H H H H H D Y
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8/6/2013

Double time due after 16 hours on any calendar day and all hours Sunday.

Apprentice Rates:

1st 6 months	\$32.32	\$45.98	\$59.64
2nd 6 months	\$34.59	\$49.39	\$64.18
3rd 6 months	\$36.88	\$52.82	\$68.76
4th 6 months	\$39.15	\$56.23	\$73.30
5th 6 months	\$41.43	\$59.65	\$77.86
6th 6 months	\$45.97	\$66.46	\$86.94

Journeyman Wireman	EC-445-IW	\$41.98	\$56.87	\$71.75	H H H H H H D N
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4/30/2008

Apprentice Rates:

0-1,000 hours	\$18.80	\$25.37	\$31.94
1,001-2,000 hours	\$20.27	\$27.58	\$34.88
2,001-2,750 hours	\$26.68	\$34.86	\$43.05
2,751-3,500 hours	\$28.16	\$37.09	\$46.01
3,501-4,250 hours	\$29.66	\$39.33	\$49.01
4,251-5,000 hours	\$31.15	\$41.57	\$51.99
5,001-5,750 hours	\$32.64	\$43.81	\$54.97
5,751-6,500 hours	\$34.12	\$46.03	\$57.93
6,501-7,250 hours	\$35.61	\$48.26	\$60.91
7,251-8,000 hours	\$37.11	\$50.51	\$63.91

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Official 2014 Prevailing Wage Rates for State Funded Projects

Issue Date: 4/2/2014

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Classification Name Description	Last Updated	Straight Hourly	Time and Half	a Double Time	Overtime Provision
Sound & Communication Technician EC-445-SC	3/6/2007	\$22.66	\$30.76	\$38.86	H H H H H H D N
Apprentice Rates:					
1st 6 months		\$10.16	\$14.42	\$18.66	
2nd 6 months		\$10.93	\$15.57	\$20.20	
3rd 6 months		\$11.70	\$16.72	\$21.74	
4th 6 months		\$12.48	\$17.89	\$23.30	
5th 6 months		\$13.25	\$19.05	\$24.84	
6th 6 months		\$14.02	\$20.20	\$26.38	
Lineman/Technician outside utility and commercial power and high voltage pipe type cable work and electrical underground. EC-876	11/18/2009	\$47.05	\$68.11	\$89.17	H H H H H H D Y
Four 10s allowed Monday-Thursday with Friday makeup or Tuesday-Friday with Monday makeup.					
Apprentice Rates:					
1st period		\$30.20	\$42.69	\$55.26	
2nd period		\$32.32	\$46.02	\$59.70	
3rd period		\$34.42	\$49.16	\$63.90	
4th period		\$36.53	\$52.33	\$68.12	
5th period		\$38.63	\$55.47	\$72.32	
6th period		\$40.74	\$58.64	\$76.54	
7th period		\$42.84	\$61.79	\$80.74	
Elevator Constructor Elevator Constructor Mechanic	EL-85 4/8/2013	\$70.77		\$116.32	D D D D D D D Y
Apprentice Rates:					
1st year		\$50.27		\$75.32	
2nd year		\$54.83		\$84.44	
3rd year		\$57.10		\$88.98	
4th year		\$61.66		\$98.10	

Official Request #: 496
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Official 2014 Prevailing Wage Rates for State Funded Projects

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
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Glazier

Glazier	GL-312	10/7/2009	\$31.34	\$43.86	\$56.38	X X X X X X X D Y
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A four ten hour day work week is allowed. If 4 or more straight-time hours lost due to job being down, Friday may be scheduled as a make up day.

Apprentice Rates:

1st 90 days	\$17.57	\$23.20	\$28.84
2nd 90 days	\$18.82	\$25.08	\$31.34
2nd 6 months	\$20.07	\$26.96	\$33.84
3rd 6 months	\$21.32	\$28.83	\$36.34
4th 6 months	\$22.58	\$30.72	\$38.86
5th 6 months	\$23.83	\$32.60	\$41.36
6th 6 months	\$25.08	\$34.47	\$43.86
7th 6 months	\$26.33	\$36.34	\$46.36
8th 6 months	\$27.58	\$38.22	\$48.86
9th 6 months	\$28.84	\$40.11	\$51.38
10th 6 months	\$30.09	\$41.98	\$53.88

Heat and Frost Insulator

Spray Insulation	AS25S	3/5/2007	\$20.14	\$29.14		H H H H H H H N
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Heat and Frost Insulator and Asbestos Worker

Heat and Frost Insulator and Asbestos Worker	AS47	3/11/2013	\$44.40	\$58.76	\$73.12	H H H H H H H D Y
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4 ten hour work days shall be either Monday thru Thursday or Tuesday thru Friday

Apprentice Rates:

1st year	\$25.78	\$32.96	\$40.14
2nd year	\$29.50	\$38.11	\$46.73
3rd year	\$33.22	\$43.27	\$53.32
4th year	\$36.95	\$48.44	\$59.93
5th year	\$40.68	\$53.61	\$66.53

Ironworker

Pre-engineered Metal Work	IR-25-PE-Z2	6/3/2013	\$42.37	\$51.88	\$61.39	X X H X X X X D Y
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Apprentice Rates:

1st Year	\$25.46	\$30.77	\$36.08
3rd 6 month period	\$27.58	\$33.64	\$39.70
4th 6 month period	\$29.71	\$36.53	\$43.35
5th 6 month period	\$31.83	\$39.40	\$46.97
6th 6 month period	\$33.96	\$42.29	\$50.61

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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

Issue Date: 4/2/2014

Contract must be awarded by: 7/1/2014

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Fence, Sound Barrier & Guardrail erection/installation and Exterior Signage work	IR-340-F2 4/2/2013	\$29.15	\$39.15	\$49.15 X X H X X X H D Y

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

Apprentice Rates:

60% Level	\$20.35	\$26.35	\$32.35
65% Level	\$21.45	\$27.95	\$34.45
70% Level	\$22.56	\$29.56	\$36.56
75% Level	\$23.65	\$31.15	\$38.65
80% Level	\$24.75	\$32.75	\$40.75
85% Level	\$25.85	\$34.35	\$42.85

Reinforcing: any work in connection with field fabrication, post tensioning, prestressing of handling by power, rigging, crane signaling, crane assembly and dismantle, racking, sorting, cutting, bending, hoisting, placing, burning, welding, use of tie gun, and tying of all materials used to reinforce concrete construction. Realigning of reinforcing steel, wire mesh and placing of steel dowels, as well as refastening and resetting same while concrete is being poured. The handling and placing of j or jack bar on slip form construction. The placing of all clips, bolts, and steel rods and wire fabricator mesh pertaining to gunite construction. Drilling holes in concrete for dowels used to reinforce a concrete slab, beam or wall and the use of a chemical anchoring system (such as epoxy) to secure dowels. The use of a non-metallic carbon fiber or polymer typically used to reinforce concrete. Some brand names are NEFMAC, leadline or Tokyo rope.	IR-340-Ref 9/13/2013	\$45.40	\$55.74	\$66.08 H H H H H H H D Y
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Apprentice Rates:

Registered 1st year	\$27.26	\$33.41	\$39.56
Registered 2nd year	\$28.31	\$34.98	\$41.66
Registered 3rd year	\$33.90	\$42.15	\$50.39

Rigging, heavy machinery moving and related tasks	IR-340-RIG 4/4/2013	\$37.43	\$47.43	\$57.43 X X X X X X D Y
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Apprentice Rates:

1st year	\$22.50	\$27.31	\$32.11
2nd year	\$25.61	\$33.31	\$40.11
3rd year	\$30.59	\$40.17	\$48.65
4th year	\$32.67	\$43.52	\$53.11

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Structural and Finish work: all work related to the fabrication, erection & construction of all iron, steel, precast and reinforced concrete structures; bolting, decking, siding, glazing and curtain wall, misc steel stairways, handrails; rigging, signaling, loading, unloading, sorting and stacking of all material. The framing and erection or dismantling of all cranes, travelers and derricks. Field & job fabrication cutting, bending, drilling, welding & burning with acetylene torch or electric device; operation of man lifts or equipment to perform work; misc and ornamental iron and metal, including lockers, jail doors, bunks, iron doors, guardhouses, grating, racks, platforms and uni-strut supports; aligning or leveling or surveying in connection with steel or machinery erection. All demolition and dismantling or iron, steel, precast & reinforced concrete structures.	IR-340-STR 7/3/2012	\$45.15	\$55.49	\$65.83 H H H H H H H D Y

Apprentice Rates:

1st Year Registered	\$27.26	\$33.41	\$39.56
2nd Year Registered	\$28.31	\$34.98	\$41.66
3rd Year Registered	\$33.90	\$42.15	\$50.39
4th Year Registered	\$36.00	\$45.29	\$54.59

Laborer

Class A Laborer - all construction on buildings, pumps, well wheels, air, electric or gasoline tools, motor driven buggies, fire watch duty, working on swing scaffolds, heavy construction work, carpenter tender, cement finisher tender, heater tender, and flagperson. Cleaning and clearing of all debris, including wire brushing of windows, scraping of floors, removal of surplus material from all fixtures within confines of structure and cleaning all debris in building and construction area. The general cleanup, including sweeping, cleaning, washdown and wiping of construction facility, equipment and furnishings and removal and loading or burning of all debris including crates, boxes, packaging waste material. Washing and cleaning of walls, partitions, ceilings, windows, bathrooms, kitchens, laboratory, and all fixtures and facilities therein. Cleanup, mopping, washing, waxing and polishing or dusting of all floors or areas.	L355-1-A 8/14/2013	\$31.09	\$40.38	\$49.67 X X H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$26.44	\$33.41	\$40.37
1,001-2,000 work hours	\$27.37	\$34.80	\$42.23
2,001-3,000 work hours	\$28.30	\$36.19	\$44.09
3,001-4,000 work hours	\$30.16	\$38.99	\$47.81

Official Request #: 496

Requestor: MDOT

Project Description: City of Marshall - Build Salt Storage Facility

Project Number:

County: Calhoun

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Official 2014 Prevailing Wage Rates for State Funded Projects

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Contract must be awarded by: 7/1/2014

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Classification Name Description	Last Updated	Straight Time and Hourly	a Double Time Half	Overtime Provision
Class B Laborer - jackhammer operator, crocklayer and caisson worker in buildings	L355-1-B 11/21/2013	\$31.34	\$40.76	\$50.17 X X H H H H H D Y

Apprentice Rates:

0-1,000 work hours	\$26.63	\$33.69	\$40.75
1,001-2,000 work hours	\$27.57	\$35.10	\$42.63
2,001-3,000 work hours	\$28.52	\$36.53	\$44.53
3,001-4,000 work hours	\$30.40	\$39.35	\$48.29

Class C Laborer - top men on chimneys or towers over thirty feet in height, material mixers, portable mixer operator, plasterer tender, mason tender certified from M.L.T.I., and MLTAI certified demolition burner.	L355-1-C 8/14/2013	\$31.84	\$41.51	\$51.17 X X H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$27.01	\$34.26	\$41.51
1,001-2,000 work hours	\$27.97	\$35.70	\$43.43
2,001-3,000 work hours	\$28.94	\$37.15	\$45.37
3,001-4,000 work hours	\$30.87	\$40.05	\$49.23

Class D Laborer - concrete specialist when no cement finishers are available; troweling, finishing, screeding, patching, cutting, curing of cast in place or precast concrete by any and all methods.	L355-1-D 8/14/2013	\$36.29	\$48.13	\$59.97 X X H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$30.37	\$39.25	\$48.13
1,001-2,000 work hours	\$31.55	\$41.02	\$50.49
2,001-3,000 work hours	\$32.74	\$42.81	\$52.87
3,001-4,000 work hours	\$35.11	\$46.36	\$57.61

Laborer - Hazardous

Class A Laborer - 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.	LHAZ-Z9-A 11/1/2013	\$30.82	\$43.33	\$55.84 H H H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$26.24	\$36.47	\$46.68
1,001-2,000 work hours	\$27.16	\$37.85	\$48.52
2,001-3,000 work hours	\$28.07	\$39.21	\$50.34
3,001-4,000 work hours	\$29.90	\$41.95	\$54.00

Official Request #: 496

Requestor: MDOT

Project Description: City of Marshall - Build Salt Storage Facility

Project Number:

County: Calhoun

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Contract must be awarded by: 7/1/2014

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Class B Laborer - performing work in conjunction with the removal, handling, or containment of hazardous waste substances when the use of personal protective equipment levels "A", "B" or "C" is required.	LHAZ-Z9-B 11/1/2013	\$31.82	\$44.83	\$57.84 H H H H H H D Y
Apprentice Rates:				
0-1,000 work hours		\$26.99	\$37.59	\$48.18
1,001-2,000 work hours		\$27.96	\$39.05	\$50.12
2,001-3,000 work hours		\$28.92	\$40.49	\$52.04
3,001-4,000 work hours		\$30.85	\$43.38	\$55.90
Laborer Underground - Tunnel, Shaft & Caisson				
Class I - Tunnel, shaft and caisson laborer, dump man, shanty man, hog house tender, testing man (on gas), and watchman.	LAUCT-Z2-1 9/9/2013	\$35.67	\$47.07	\$58.47 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$30.52	\$39.35	\$48.17
1,001-2,000 work hours		\$31.55	\$40.90	\$50.23
2,001-3,000 work hours		\$32.58	\$42.44	\$52.29
3,001-4,000 work hours		\$34.64	\$45.53	\$56.41
Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder	LAUCT-Z2-2 9/9/2013	\$35.76	\$47.21	\$58.65 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$30.58	\$39.44	\$48.29
1,001-2,000 work hours		\$31.62	\$41.00	\$50.37
2,001-3,000 work hours		\$32.66	\$42.56	\$52.45
3,001-4,000 work hours		\$34.72	\$45.65	\$56.57

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
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.).	LAUCT-Z2-3 9/9/2013	\$35.86	\$47.36	\$58.85 X X X X X X D Y

Apprentice Rates:

0-1,000 work hours	\$30.66	\$39.56	\$48.45
1,001-2,000 work hours	\$31.70	\$41.12	\$50.53
2,001-3,000 work hours	\$32.74	\$42.68	\$52.61
3,001-4,000 work hours	\$34.82	\$45.80	\$56.77

Class IV - Tunnel, shaft and caisson mucker, bracer man, liner plate man, long haul dinky driver and well point man.	LAUCT-Z2-4 9/9/2013	\$36.02	\$47.60	\$59.17 X X X X X X D Y
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Apprentice Rates:

0-1,000 work hours	\$30.78	\$39.74	\$48.69
1,001-2,000 work hours	\$31.83	\$41.32	\$50.79
2,001-3,000 work hours	\$32.88	\$42.89	\$52.89
3,001-4,000 work hours	\$34.97	\$46.02	\$57.07

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-Z2-5 9/9/2013	\$36.28	\$47.99	\$59.69 X X X X X X D Y
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Apprentice Rates:

0-1,000 work hours	\$30.98	\$40.04	\$49.09
1,001-2,000 work hours	\$32.04	\$41.63	\$51.21
2,001-3,000 work hours	\$33.10	\$43.22	\$53.33
3,001-4,000 work hours	\$35.22	\$46.40	\$57.57

Class VI - Dynamite man and powder man.	LAUCT-Z2-6 9/9/2013	\$36.59	\$48.45	\$60.31 X X X X X X D Y
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Apprentice Rates:

0-1,000 work hours	\$31.21	\$40.38	\$49.55
1,001-2,000 work hours	\$32.28	\$41.99	\$51.69
2,001-3,000 work hours	\$33.36	\$43.61	\$53.85
3,001-4,000 work hours	\$35.51	\$46.84	\$58.15

Official Request #: 496
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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
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.	LAUCT-Z2-7 9/9/2013	\$28.86	\$36.86	\$44.85 X X X X X X D Y

Apprentice Rates:

0-1,000 work hours	\$25.41	\$31.68	\$37.95
1,001-2,000 work hours	\$26.10	\$32.72	\$39.33
2,001-3,000 work hours	\$26.79	\$33.76	\$40.71
3,001-4,000 work hours	\$28.17	\$35.82	\$43.47

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.	LLAN-Z2-A 7/5/2013	\$27.45	\$37.91	\$48.37 X X H X X X H D Y
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Skilled Landscape Laborer: small power tool operator, lawn sprinkler installers' tender, material mover, truck driver on 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.	LLAN-Z2-B 7/5/2013	\$23.25	\$31.61	\$39.97 X X H X X X H D Y
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Operating Engineer

Class C- Regular equipment operator, crane, stiff leg derrick, scraper dozer, grader, front end loader, hoist, job mechanic, head grease man, concrete pump truck & hydro excavators	EN-324-BH1C 9/12/2013	\$49.35	\$63.52	\$77.69 H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.

Apprentice Rates:

0 - 999 hours	\$40.25	\$50.17	\$60.09
1,000 - 1,999 hours	\$41.67	\$52.30	\$62.93
2,000 - 2,999 hours	\$43.08	\$54.41	\$65.75
3,000 - 3,999 hours	\$44.50	\$56.55	\$68.59
4,000 - 4,999 hours	\$45.92	\$58.67	\$71.43
5,000 - 5,999 hours	\$47.33	\$60.79	\$74.25

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Class D- Air tugger (single drum), material hoist, boiler operator, sweeping machine, winch truck, Bob Cat & similar equipment, elevators (when operated by an operating engineer), and fork truck over 20' lift	EN-324-BH1D 9/12/2013	\$44.25	\$55.87	\$67.49 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class E- Pump 6" or over, well points, freeze systems, boom truck (non-swinging), end dumps and laser/power screed, concrete wire saw 20 h.p. and over, & brokk concrete breaker	EN-324-BH1E 9/12/2013	\$43.65	\$54.97	\$66.29 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class F- Air compressor, welder, generators, conveyors, pumps under 6", Grease man, and fork truck 20' or less lift	EN-324-BH1F 9/12/2013	\$41.20	\$51.30	\$61.39 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class G- Oiler, fireman and heater operator	EN-324-BH1G 9/12/2013	\$39.55	\$48.82	\$58.09 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class A- Crane w/ main Boom & Jib 220' or longer	EN-OSA 9/12/2013	\$50.10	\$64.65	\$79.19 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class A- Crane w/ main Boom & Jib 300' or longer	EN-OSA3 9/12/2013	\$51.60	\$66.90	\$82.19 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.				

Official Request #: 496
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Classification Name Description		Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Class A- Crane w/ main Boom & Jib 400' or longer	EN-OSA4	9/12/2013	\$53.10	\$69.15	\$85.19 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.					

Class B- Crane Operator with main boom and jib 140' or longer, tower cranes, gantry crane, whirley derrick	EN-OSB	9/12/2013	\$49.85	\$64.27	\$78.69 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on Friday.					

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
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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
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Holiday pay= \$124.55 per hour, wages & fringes

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	GLF-2	2/12/2014	\$63.50	\$82.60	\$101.70 X X H H H H D Y
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Holiday pay = \$120.80 per hour, wages & fringes

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

Friction, Lattice Boom or Crane License Certification	GLF-2B	2/12/2014	\$64.50	\$84.10	\$103.70 X X H H H H D Y
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Holiday pay = \$123.30

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

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	GLF-3	2/12/2014	\$59.30	\$76.30	\$93.30 X X H H H H D Y
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Holiday pay = \$110.30 per hour, wages & fringes

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

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Statewide

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Contract must be awarded by: 7/1/2014

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Deck Equipment Operator, (Machineryman/Fireman), (4 equipment units or more), Off Road Trucks, Deck Hand, Tug Engineer, & Crane Maintenance 50 ton capacity and under or Backhoe 115,000 lbs or less, Assistant Tug Operator	GLF-4 2/12/2014	\$53.60	\$67.75	\$81.90 X X H H H H H D Y

Holiday pay = \$96.05 per hour, wages & fringes

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

Operating Engineer Hazardous Waste Class I

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWCI-Z2A 1/20/2012	\$50.13	\$65.29	\$80.45 H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$40.44	\$51.06	\$61.67
2nd 6 months	\$41.96	\$53.34	\$64.71
3rd 6 months	\$43.48	\$55.62	\$67.75
4th 6 months	\$44.98	\$57.87	\$70.75
5th 6 months	\$46.50	\$60.15	\$73.79
6th 6 months	\$48.02	\$62.43	\$76.83

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWCI-Z2B 1/23/2012	\$49.18	\$63.87	\$78.55 H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$39.77	\$50.05	\$60.33
2nd 6 months	\$41.24	\$52.26	\$63.27
3rd 6 months	\$42.70	\$54.44	\$66.19
4th 6 months	\$44.18	\$56.66	\$69.15
5th 6 months	\$45.65	\$58.87	\$72.09
6th 6 months	\$47.11	\$61.06	\$75.01

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCI-Z2D 1/23/2012	\$47.88	\$61.92	\$75.95 H H H H H H D Y

Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$38.86	\$48.69	\$58.51
2nd 6 months	\$40.27	\$50.80	\$61.33
3rd 6 months	\$41.67	\$52.91	\$64.13
4th 6 months	\$43.07	\$55.00	\$66.93
5th 6 months	\$44.48	\$57.12	\$69.75
6th 6 months	\$45.88	\$59.21	\$72.55

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCI-Z2DCL 1/23/2012	\$47.63	\$61.54	\$75.45 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$38.68	\$48.42	\$58.15
2nd 6 months	\$40.07	\$50.50	\$60.93
3rd 6 months	\$41.46	\$52.58	\$63.71
4th 6 months	\$42.85	\$54.67	\$66.49
5th 6 months	\$44.25	\$56.78	\$69.29
6th 6 months	\$45.64	\$58.86	\$72.07

Operating Engineer Hazardous Waste Class II

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWCII-Z2A 1/20/2012	\$45.73	\$58.69	\$71.65 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWCII-Z2B 1/23/2012	\$44.79	\$57.28	\$69.77 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Official Request #: 496
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 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

Official Rate Schedule
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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCII-Z2D 1/23/2012	\$43.49	\$55.33	\$67.17 H H H H H H D Y

Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCII-Z2DCL 1/23/2012	\$43.24	\$54.96	\$66.67 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads 140' or longer

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HW140-Z2A 1/20/2012	\$52.78	\$69.27	\$85.75 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HW140-Z2B 1/23/2012	\$51.72	\$67.68	\$83.63 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW140-Z2D 1/23/2012	\$50.53	\$65.89	\$81.25 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW140-Z2DCL 1/23/2012	\$50.28	\$65.52	\$80.75 H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Official Request #: 496
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Classification Name	Description	Last Updated	Straight Time and Hourly	a Double Half	Time	Overtime Provision
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**Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads
220' or longer**

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HW220-Z2A 1/20/2012	\$53.08	\$69.72	\$86.35	H H H H H H H H	D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HW220-Z2B 1/23/2012	\$52.04	\$68.16	\$84.27	H H H H H H H H	D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z2D 1/23/2012	\$50.83	\$66.34	\$81.85	H H H H H H H H	D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z2DCL 1/23/2012	\$50.58	\$65.97	\$81.35	H H H H H H H H	D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

**Operating Engineer Hazardous Waste Regular Crane, Job
Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel
Operator and Concrete Pump with boom**

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWRC-Z2A 1/20/2012	\$51.10	\$66.75	\$82.39	H H H H H H H H	D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

Official Rate Schedule
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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with Boom Operator				
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWRC-Z2B 1/23/2012	\$50.15	\$65.32	\$80.49 H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.				
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z2D 1/23/2012	\$48.85	\$63.37	\$77.89 H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.				
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z2DCL 1/23/2012	\$48.60	\$63.00	\$77.39 H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.				
Operating Engineer Steel Work				
Class A- Crane w/ main Boom & Jib 220' or longer Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.	EN-324-SWW1220 9/12/2013	\$50.45	\$65.17	\$79.89 H H H H H H D Y
Class A- Crane w/ main Boom & Jib 300' or longer	EN-324-SWW1300 9/12/2013	\$51.95	\$67.42	\$82.89 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.				
Class A- Crane w/ main Boom & Jib 400' or longer	EN-324-SWW1400 9/12/2013	\$53.45	\$69.67	\$85.89 H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.				

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 County: Calhoun

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Classification Name Description	Last Updated	Straight Hourly	Time and Half	a Double Time	Overtime Provision
Class B- Crane Operator with main boom and jib 140' or longer, tower cranes, gantry crane, whirley derrick	EN-324-SWW1B 9/12/2013	\$50.20	\$64.80	\$79.39	H H H H H H D Y

Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Class C- Regular equipment operator, crane, dozer, grader, loader, hoist, straddle wagon, job mechanic & hydro excavator	EN-324-SWW1C 9/12/2013	\$49.70	\$64.05	\$78.39	H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Apprentice Rates:

0 - 999 hours	\$40.49	\$50.53	\$60.57
1,000 - 1,999 hours	\$41.93	\$52.69	\$63.45
2,000 - 2,999 hours	\$43.36	\$54.83	\$66.31
3,000 - 3,999 hours	\$44.80	\$56.99	\$69.19
4,000 - 4,999 hours	\$46.23	\$59.14	\$72.05
5,000 - 5,999 hours	\$47.67	\$61.30	\$74.93

Class D- Air tugger (single drum), material hoist, pump 6" or over, elevators (when operated by an operating engineer) and brokk concrete breaker	EN-324-SWW1D 9/12/2013	\$44.60	\$56.40	\$68.19	H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Class E- Air compressor, welder, generators and	EN-324-SWW1E 9/12/2013	\$42.95	\$53.92	\$64.89	H H H H H H D Y
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Class F- Oiler and Fireman	EN-324-SWW1F 9/12/2013	\$40.35	\$50.02	\$59.69	H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
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 County: Calhoun

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Official 2014 Prevailing Wage Rates for State Funded Projects

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Operating Engineer Underground				
Class I Equipment - Backfiller Tamper, Backhoe, Batch Plant Operator, Clamshell, Concrete Paver 2 drums or larger, Conveyor Loader Euclid type, Crane (crawler, truck type or pile driving), Dozer, Dragline, Elevating Grader, endloader, gradall, grader, hydro excavator, power shovel, roller asphalt, scraper self-propelled or tractor drawn, side boom tractor, slip form paver, slope paver, trencher over 8 ft. digging capacity, well drilling rig, concrete pump with boom operator	EN-324A2-UC1 9/13/2013	\$48.63	\$62.77	\$76.90 H H H H H H D Y
Apprentice Rates:				
	0-999 hours	\$38.70	\$48.42	\$58.14
	1,000-1,999 hours	\$40.09	\$50.50	\$60.92
	2,000-2,999 hours	\$41.48	\$52.59	\$63.70
	3,000-3,999 hours	\$42.87	\$54.68	\$66.48
	4,000-4,999 hours	\$44.26	\$56.76	\$69.26
	5,000-5,999 hours	\$45.64	\$58.83	\$72.02
Class II Equipment - Boom Truck, Crusher, Hoist, Pump 6 inch discharge or larger, side boom tractor, Tractor (pneumatically other than backhoe or front end loader), Trencher 8 ft. digging capacity and smaller, Vac Truck	EN-324A2-UC2 9/13/2013	\$43.74	\$55.43	\$67.12 H H H H H H D Y
Class III Equipment - Air Compressors 600 cfm or larger, Air Compressors 2 or more less than 600 cfm, Boom Truck non-swinging non-powered type boom, Concrete Breaker self-propelled or truck mounted, Concrete paver 1 drum 1/2 yd. or larger, Elevator other than passenger, Pump 4 inch to 6 inch discharge, pumpcrete machine, wagon drill, welding machine or generator 2 or more 300	EN-324A2-UC3 9/13/2013	\$43.24	\$54.68	\$66.12 H H H H H H D Y
Class IV Equipment - Boiler, Concrete Saw 40 hp or over, curing machine self propelled, end dumps, extend a boom forklift, farm tractor with attachment, finishing machine concrete, firemen, hydraulic pipe pushing machine, mulching equipment, oiler, pumps up to 4 inch discharge, roller other than asphalt, stump remover, sweeper wayne type, trencher, vibrating compaction equipment self propelled 6 ft. wide or over, water wagon.	EN-324A2-UC4 9/13/2013	\$42.96	\$54.26	\$65.56 H H H H H H D Y

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Painter				
Brush & Roll, Drywall Taping	PT-312 8/2/2013	\$33.79	\$44.67	\$55.54 H H H H H H D Y
A four 10 hour day work schedule may be used, consecutive days, Monday-Friday. A makeup day may be scheduled for missed work due to holidays or inclement weather, Monday-Friday.				
Apprentice Rates:				
0-1,000 hours		\$24.00	\$29.98	\$35.96
1,001-2,000 hours		\$25.09	\$31.62	\$38.14
2,001-3,000 hours		\$26.83	\$34.22	\$41.62
3,001-4,000 hours		\$28.35	\$36.50	\$44.66
4,001-5,000 hours		\$30.53	\$39.78	\$49.02
5,001-6,000 hours		\$32.70	\$43.03	\$53.36
Pipe and Manhole Rehab				
General Laborer for rehab work or normal cleaning and cctv work-top man, scaffold man, CCTV assistant, jetter-vac assistant	TM247 10/15/2012	\$27.20	\$36.70	H H H H H H H N
Tap cutter/CCTV Tech/Grout Equipment Operator: unit driver and operator of CCTV; grouting equipment and tap cutting equipment	TM247-2 10/15/2012	\$31.70	\$43.45	H H H H H H H N
CCTV Technician/Combo Unit Operator: unit driver and operator of cctv unit or combo unit in connection with normal cleaning and televising work	TM247-3 10/15/2012	\$30.45	\$41.57	H H H H H H H N
Boiler Operator: unit driver and operator of steam/water heater units and all ancillary equipment associated	TM247-4 10/15/2012	\$32.20	\$44.20	H H H H H H H N
Combo Unit driver & Jetter-Vac Operator	TM247-5 10/15/2012	\$32.20	\$44.20	H H H H H H H N
Pipe Bursting & Slip-lining Equipment Operator	TM247-6 10/15/2012	\$33.20	\$45.70	H H H H H H H N

Official Request #: 496
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 County: Statewide

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Plasterer				
Plasterer	BR9-17-PL 3/7/2013	\$39.46	\$51.62	\$63.78 H H H H H H D Y
Apprentice Rates:				
0-749 hours		\$30.95	\$38.86	\$46.76
750-1499 hours		\$32.16	\$40.67	\$49.18
1500-2249 hours		\$33.38	\$42.50	\$51.62
2250-2999 hours		\$34.60	\$44.33	\$54.06
3000-3749 hours		\$35.81	\$46.14	\$56.48
3750-4499 hours		\$37.03	\$47.98	\$58.92
Plasterer	PL16-1 10/23/2012	\$33.61	\$44.20	\$54.79 H H H H H H D N
Apprentice Rates:				
1st year		\$26.20	\$33.09	\$39.97
2nd year		\$28.31	\$36.25	\$44.19
3rd year		\$30.43	\$39.43	\$48.43
Plumber & Pipefitter				
Plumber & Pipefitter	PL-333-RIII 12/29/2009	\$51.02	\$76.33	\$101.64 H H H H H H D Y
Four 10s allowed Monday thru Thursday. Friday not a makeup, considered OT, paid @ time & one-half.				
Apprentice Rates:				
1st Period		\$32.97	\$49.26	\$65.54
2nd Period		\$34.61	\$51.72	\$68.82
3rd Period		\$36.25	\$54.18	\$72.10
4th Period		\$37.89	\$56.64	\$75.38
5th Period		\$39.53	\$59.10	\$78.66
6th Period		\$41.17	\$61.56	\$81.94
7th Period		\$42.82	\$64.03	\$85.24
8th Period		\$44.46	\$66.49	\$88.52
9th Period		\$46.10	\$68.95	\$91.80
10th Period		\$47.74	\$71.41	\$95.08

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Classification Name Description	Last Updated	Straight Time and Hourly	a Double Time	Overtime Provision
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Roofer

Commercial Roofer	RO-70-Z3	6/28/2013	\$38.73	\$49.86	\$60.98	H H H X H H H D Y
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4 consecutive ten hour days allowed M- TH w/o OT

4 tens allowed M-Th

Apprentice Rates:

1st Class	\$23.08	\$28.58	\$34.08
2nd Class	\$24.20	\$30.20	\$36.20
3rd Class	\$27.21	\$33.71	\$40.46
4th Class	\$29.33	\$37.20	\$45.08
5th Class	\$30.90	\$39.53	\$48.15
6th Class	\$31.96	\$41.09	\$50.21
7th Class	\$33.02	\$42.65	\$52.27

Sewer Relining

Class I-Operator of audio visual CCTV system including remote in-ground cutter and other equipment used in conjunction with CCTV system.	SR-I	3/27/2013	\$42.07	\$56.90	\$71.72	H H H H H H H D N
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Class II-Operator of hot water heaters and circulation system; water jettors; and vacuum and mechanical debris removal systems and those assisting.	SR-II	3/27/2013	\$40.54	\$54.60	\$68.66	H H H H H H H D N
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Sheet Metal Worker

Sheet Metal Worker	SHM-7-1	10/22/2012	\$45.92	\$59.47	\$73.02	H H H H D D D D Y
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4 10s allowed as consecutive days, M-Th or T-F

Apprentice Rates:

First Year	\$24.69	\$31.46	\$38.24
Second Year	\$29.86	\$37.99	\$46.12
Third Year	\$37.79	\$47.28	\$56.76
Fourth Year	\$40.50	\$51.34	\$62.18

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Sprinkler Fitter				
Sprinkler Fitter	SP 669 9/17/2009	\$46.51	\$61.99	\$77.47 H H H H H H D Y
Apprentice Rates:				
Class 1 & 2		\$23.44	\$31.31	\$39.17
Class 3		\$29.35	\$37.75	\$46.15
Class 4		\$30.93	\$40.12	\$49.31
Class 5		\$35.50	\$45.47	\$55.45
Class 6		\$37.07	\$47.83	\$58.59
Class 7		\$38.65	\$50.20	\$61.75
Class 8		\$40.22	\$52.55	\$64.89
Class 9		\$41.79	\$54.91	\$68.03
Class 10		\$43.36	\$57.27	\$71.17
Tile Finisher				
Tile Finisher	BR9-21-TF 3/7/2013	\$29.06	\$38.41	\$47.75 H H H H H H D Y
Apprentice Rates:				
0-749 hours		\$22.52	\$28.59	\$34.67
750-1499 hours		\$23.45	\$29.99	\$36.53
1500-2249 hours		\$24.39	\$31.40	\$38.41
2250-2999 hours		\$25.32	\$32.79	\$40.27
3000-3749 hours		\$26.26	\$34.21	\$42.15
3750-4499 hours		\$27.19	\$35.60	\$44.01
Tile, Marble, Mosaic, and Terrazzo Setter				
Tile, Marble, Mosaic, and Terrazzo Setter	BR9-21-TL 3/7/2013	\$31.78	\$41.29	\$50.80 H H H H H H D Y
Apprentice Rates:				
0 - 749 hours		\$25.12	\$31.30	\$37.48
750 - 1,499 hours		\$26.07	\$32.72	\$39.38
1,500 - 2,249 hours		\$27.02	\$34.15	\$41.28
2,250 - 2,999 hours		\$27.98	\$35.59	\$43.20
3,000 - 3,749 hours		\$28.93	\$37.02	\$45.10
3,750 - 4,499 hours		\$29.88	\$38.44	\$47.00
Truck Driver				
of all trucks of 8 cubic yd capacity or over	TM-RB2 8/8/2013	\$41.92	\$37.85	H H H H H H H Y

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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: 4/2/2014

Contract must be awarded by: 7/1/2014

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision	
of 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)	TM-RB2A 8/8/2013	\$41.82	\$37.70	H H H H H H H H Y	
on euclid type equipment	TM-RB2B 8/8/2013	\$41.35	\$38.08	H H H H H H H H Y	
Underground Laborer Open Cut, Class I Construction Laborer	LAUC-Z4-1 9/11/2013	\$32.52	\$42.35	\$52.17 X X X X X X D Y	
Apprentice Rates:					
		0-1,000 work hours	\$28.17	\$35.83	\$43.47
		1,001-2,000 work hours	\$29.04	\$37.13	\$45.21
		2,001-3,000 work hours	\$29.91	\$38.43	\$46.95
		3,001-4,000 work hours	\$31.65	\$41.05	\$50.43
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-Z4-2 9/11/2013	\$32.65	\$42.54	\$52.43 X X X X X X D Y	
Apprentice Rates:					
		0-1,000 work hours	\$28.27	\$35.97	\$43.67
		1,001-2,000 work hours	\$29.14	\$37.28	\$45.41
		2,001-3,000 work hours	\$30.02	\$38.60	\$47.17
		3,001-4,000 work hours	\$31.77	\$41.23	\$50.67
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.	LAUC-Z4-3 9/11/2013	\$32.76	\$42.71	\$52.65 X X X X X X D Y	
Apprentice Rates:					
		0-1,000 work hours	\$28.35	\$36.09	\$43.83
		1,001-2,000 work hours	\$29.23	\$37.41	\$45.59
		2,001-3,000 work hours	\$30.11	\$38.73	\$47.35
		3,001-4,000 work hours	\$31.88	\$41.39	\$50.89

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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Classification Name Description	Last Updated	Straight Time and Hourly Half	a Double Time	Overtime Provision
Underground Laborer Open Cut, Class IV				
Trench or excavating grade man.	LAUC-Z4-4 9/11/2013	\$32.83	\$42.81	\$52.79 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$28.40	\$36.17	\$43.93
1,001-2,000 work hours		\$29.29	\$37.51	\$45.71
2,001-3,000 work hours		\$30.17	\$38.83	\$47.47
3,001-4,000 work hours		\$31.94	\$41.48	\$51.01
Underground Laborer Open Cut, Class V				
Pipe Layer	LAUC-Z4-5 9/11/2013	\$32.95	\$42.99	\$53.03 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$28.49	\$36.31	\$44.11
1,001-2,000 work hours		\$29.38	\$37.64	\$45.89
2,001-3,000 work hours		\$30.28	\$38.99	\$47.69
3,001-4,000 work hours		\$32.06	\$41.66	\$51.25
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 & the installation and repair of water service pipe and appurtenances.	LAUC-Z4-6 9/11/2013	\$30.17	\$38.82	\$47.47 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$26.41	\$33.19	\$39.95
1,001-2,000 work hours		\$27.16	\$34.31	\$41.45
2,001-3,000 work hours		\$27.91	\$35.43	\$42.95
3,001-4,000 work hours		\$29.42	\$37.70	\$45.97
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.	LAUC-Z4-7 9/11/2013	\$28.51	\$36.33	\$44.15 X X X X X X D Y
Apprentice Rates:				
0-1,000 work hours		\$25.16	\$31.31	\$37.45
1,001-2,000 work hours		\$25.83	\$32.31	\$38.79
2,001-3,000 work hours		\$26.50	\$33.32	\$40.13
3,001-4,000 work hours		\$27.84	\$35.33	\$42.81

Official Request #: 496
 Requestor: MDOT
 Project Description: City of Marshall - Build Salt Storage Facility
 Project Number:
 County: Calhoun

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.

SECTION 010000 - GENERAL REQUIREMENTS

1.01 PRECONSTRUCTION CONFERENCES

The Owner shall schedule a preconstruction conference to be attended by the Contractor. Once the project has been started, the Contractor shall carry it to completion without delay.

1.02 COOPERATION BY CONTRACTOR

- A. Phasing of Work shall be clearly established and verified with the Owner prior to commencing Work in any area. No cutting or removal Work shall begin until authorized by the City/County Engineer.
- B. Any building utility service interruptions or outages required by the Contractor in performing the Work shall be prearranged with the City/County Engineer and shall occur only during those scheduled times.

1.03 INSPECTION

- A. The Owner will designate an Inspector for this Contract. It will be the responsibility of this Contractor to notify the Inspector of the date operations are to start and to contact the Inspector periodically during the course of the Work so as to insure that Work is being performed in accordance with the conditions of this Contract.
- B. The Inspector will not be authorized to revoke, alter, enlarge or relax any of the provisions of these specifications, or to change the Contract Work in any particular. In case of any dispute arising between the Contractor and the Inspector as to the manner of performing the Work, the Inspector shall have authority to suspend the Work until the question at issue can be resolved by the Owner. In no instance shall any action or omission on the part of the Inspector relieve the Contractor of the responsibility of completing Work in accordance with the Contract Documents (Plans and Specifications).

1.04 CUTTING AND PATCHING

- A. The Contractor shall do all cutting, fitting or patching of the Work that may be required to make its several parts fit together properly. The Contractor shall take proper precautions so as not to endanger any work by cutting or digging. The Contractor shall not cut or alter existing structural members or foundations, except where called for on the drawings or in the specifications or where written approval is received by the City/County Engineer.

- B. Holes or openings cut in exterior walls and roofs for installation of materials or equipment shall be waterproofed by an appropriate means.
- C. All adjacent finished surfaces that are damaged by the Work shall be patched with materials matching existing surfaces. Joints between patched and existing material shall be straight, smooth and flush. All patching material shall be applied by workmen skilled in its installation.

1.05 SERVICE MANUALS

Upon completion of the contract work, three (3) complete service manuals for each item of mechanically operated equipment shall be furnished to the Owner. These manuals shall include the following information:

- 1. Complete wiring diagrams
- 2. Fully cataloged capacity ratings and electrical characteristics
- 3. Complete service, parts, and operating manuals

1.06 SHOP DRAWINGS & PRODUCT DATA

Prior to the delivery of any material and/or equipment to the job site, the Contractor shall submit with such promptness as to cause no delay in the Work, a minimum of five (5) copies of shop drawings, product data catalogs, material schedules, etc., to the City/County Engineer for review and/or approval. The Contractor shall include the information printed on each and every sheet of the Shop Drawings and on the cover page of each and every specification, catalog or pamphlet as follows:

Name and location of the project

Project Account Number

Drawing Number

Date of Drawing

Following examination by the City/County Engineer, three (3) copies will be retained for the Owner's use and remaining copies will be returned to the Contractor with the indication of approval or with notations for correction. The following materials, building systems and equipment require submission of shop drawings, materials lists, products data catalogs, etc.

- A. Roof shingles including color samples.
- B. Certification of wood species, grades, strength and pressure treatment.
- C. Wood truss drawings with design certified by a Registered Engineer in the State of Michigan.

- D. Sliding door hardware.
- E. Exhaust fan and louver.
- F. Electrical Panel.
- G. Switches and outlets.
- H. Lighting fixtures.
- I. Brine holding tank (If part of the project).
- J. Paint color samples for color selection.
- K. Reinforcement shop drawings.
- L. Concrete mix design.

The Contractor shall submit information on other material or equipment to the City/County Engineer upon request. The Contractor shall sign or stamp all information to indicate that the information is accurate and complete and conforms to intent of the Drawings and Specifications.

1.07 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

The Contractor shall furnish and install all temporary facilities and controls required by the Work, shall remove them from the Owner's property upon completion of the Work, and the grounds and existing facilities shall be restored to their original condition.

1.08 SCHEDULING OF WORK

- A. The Contractor shall consult with the City/County Engineer and set up a mutually agreeable schedule of the work. As soon as the Contractor has started the work, every effort possible shall be made to complete the work in a minimum amount of time. However, all work will be done on a straight time basis at the discretion of the Contractor and with approval of the City/County Engineer.
- B. Phasing of work shall be clearly established and verified with the Owner prior to commencing work in any area. No cutting or removal work shall begin until authorized by the Owner.

1.09 NON-INTERRUPTION IN USE OF EXISTING FACILITIES

The Contractor shall arrange and conduct his operations so that the Owner shall have safe and free access to the existing property at all times.

1.10 TEMPORARY FACILITIES AND CONTROLS

A. Work Storage Area: The Contractor shall have designated for his use--by the Owner--an area on the premises where he will confine his equipment and store all of his materials. New materials delivered to and stored outdoors on the job site shall be fully protected from weather by placement on raised platforms and shall have secure weatherproof coverings of plastic or tarpaulins.

B. Water and Electricity

Water and electricity may be available in the area where Work will be performed. The Contractor will not be charged for reasonable use of these services for construction operation. The Contractor shall pay costs for installation and removal of any temporary connections including necessary safety devices and controls. Use of services shall not disrupt or interfere with operations of the Owner.

C. Sanitary Convenience

The Contractor shall supply a temporary toilet facility on the premises for use by personnel employed in the Work.

D. Construction Aids

The Contractor shall furnish, install and maintain as long as necessary--and remove when no longer required--safe and adequate scaffolding, ladders, staging, platforms, chutes, railings, hoisting equipment, etc. as required for proper execution of the Work. All construction aids shall conform to federal, state and local codes or laws for protection of workmen and the public.

1.11 STORAGE AND PROTECTION

A. All materials and equipment delivered to and used in Work shall be suitably stored and protected from the elements. The areas used for storage shall only be those approved by the Owner. The Owner assumes no responsibility for stored material. After delivery-- before and after installation--the Contractor shall protect materials and equipment against theft, injury or damage from all causes.

B. Equipment stored outdoors shall be kept from contact with the ground, away from areas subject to flooding and covered with weatherproof plastic sheeting or tarpaulins.

1.12 PROJECT CLOSEOUT

The Contractor shall notify the City/County Engineer when the Work will be complete and ready for inspection and preparation of a list of minor replacement, correction and adjustment items. The Contractor shall be represented on the job site at the time this inspection is made and thereafter shall complete all work by the date set for final acceptance by the Owner.

- A. Cleaning: All scrap or removed material, debris or rubbish shall be regularly removed from the buildings at the end of each working day and more frequently whenever the Inspector deems such material to be a hazard to the building or its occupants. No discarded material shall be deposited on the grounds of the Owner without the express permission of the City/County Engineer. No salvage or surplus material may be sold on the premises of the Owner.
- B. Final Cleaning: Just prior to final acceptance by the Owner, the Contractor shall clean all of the Work and existing surfaces, building elements and contents that were soiled by his operations and make repairs for any damage or blemish that was caused by the Work.

1.13 PROJECT RECORD DOCUMENTS

- A. The Contractor shall obtain and forward to the City/County Engineer all operation and maintenance data, record drawings for the Work and statements on liens and guarantees. All such data and documents shall accompany the Contractor's request for final payment.
- B. As Built Drawings: The Contractor shall furnish to the City/County Engineer--with his request for final payment--marked up plans or reproducible drawings clearly showing the actual path and location of concealed material or piping installed in this project. Reproducible drawings shall be drawn at a scale of 1/8 inch per foot or larger.

1.14 WARRANTY

The Contractor shall provide a written warranty in accordance with the manufacturer's standard coverage for materials and/or installed equipment. In addition, the Contractor shall furnish the Owner with a written guarantee to remedy any defects due to faulty materials or workmanship which appear in the work within one year from the date of final acceptance by the Owner.

END OF SECTION 010000

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DIVISION 3 - CONCRETE

3.01 GENERAL

- A. Specifications for Structural Concrete for Buildings (ACI 301), latest revision, by the American Concrete Institute is included in total as specifications for this structure except as otherwise specified herein and as indicated on the drawings. The Contractor shall have a copy of this ACI Standard on the Project Site at all times.
- B. Details of concrete design and construction not covered by the specifications herein shall be in accordance with Building Code Requirements for Reinforced Concrete, (ACI 318) and the Commentary on Building Code Requirements for Reinforced Concrete (ACI 318).

3.02 SCOPE OF WORK

The work required under this division shall include all materials, labor, equipment and services necessary to furnish and install in accordance with the drawings and specifications all items listed, but not limited to: foundations, concrete walls, joints and embedded items, and reinforcing steel.

3.03 INSPECTIONS, REPORTS AND TESTING

- A. The Contractor shall notify Owner-Engineer in sufficient time to inspect:
 - 1. Form work and reinforcement before casting concrete.
 - 2. Casting concrete.
- B. Deliver (1) copy of each batch mixing order or delivery ticket directly to Owner-Engineer. If any water is added to concrete after it leaves batching plant, amount added and identification of person authorizing such addition must be noted on mixing order or delivery ticket. Time of arrival and departure for each delivery of concrete on shall be shown on each delivery order.
- C. Concrete Testing for each day of production the Contractor (and/or his representative or supplier) shall be responsible for quality control testing (e.g. testing the concrete temperature, slump, air content, and the molding and proper curing of cylinders for compression testing). The result of the tests shall be reported to the Owner-Engineer in a written format. The Owner-Engineer has the option of performing all or a portion of the quality control testing.
 - 1. Conform to ASTM C94: "Methods of Sampling & Testing".
 - 2. At least 3 sample cylinders shall be taken from any batch of each day's pour. However, the Owner-Engineer may require an additional test cylinder if pouring occurs during unfavorable weather conditions. Protect and cure test cylinders by ASTM approved field methods.
 - 3. The samples will be removed from the job site by the Owner-Engineer and tested by a certified test lab at no cost to the Contractor.

4. Allowable slump shall be 3" minimum to 5" maximum. Test each batch before placement, or as otherwise directed by the Owner-Engineer.

3.04 COLD WEATHER CONCRETE

- A. The concrete shall be protected by the use of insulated forms or by heating and housing in such a manner as to prevent damage from cold weather. Frozen concrete or concrete damaged by cold weather will be rejected and shall be removed and replaced by the Contractor at his expense.
- B. At times when the prevailing temperature will produce concrete of less than 45 degrees F, the temperature of the concrete shall be raised by heating the ingredients so that the resulting mix temperature does not exceed 70 degrees F.
- C. Further requirements for the cold weather protection of concrete shall adhere to the specifications set forth in Section 706 of the MDOT 2003 Standard Specifications for Construction and ACI-306 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING".

3.05 HOT WEATHER CONCRETE

Concrete shall not be cast when the temperature of the concrete is above 90 degrees F. Standard shall be ACI-305 for hot weather concrete.

3.06 CONCRETE FORMWORK

Structural Cast-in-Place Concrete Formwork

- A. All forms, forming material and the construction of the forms shall meet the requirements as specified in Section 706 of the MDOT 2003 Standard Specifications for Construction.
- B. All forms shall be of wood, metal or other approved material and shall be mortar-tight and sufficiently strong and rigid to prevent distortion during the placing, vibrating, and curing of the concrete. They shall be built true to the lines designated on the Plans and shall be so maintained until the concrete has sufficiently hardened to permit their removal. Forms shall be:
 1. Standard "Universal" type steel or wood modular panels with either new or used form surfaces in good acceptable condition.
 2. New plastic coated plywood sheets reused no more than (6) times, or as otherwise approved for reuse.
- C. The inside faces of all forms shall be free of holes, irregularities, unevenness in the surface, or any defects which may produce inferior work.

3.07 FORM SURFACE TREATMENT

The inside of all forms shall be treated with a light, clean, paraffin-base oil or other approved compound which will not injuriously affect the concrete surface. Treatment shall take place after all necessary forming construction is completed and before the placement of reinforcement.

3.08 FORM TIES AND ACCESSORIES

Ties and Spreaders

Form ties shall be of sufficient size and strength to hold the form work securely in place during placement and curing of the concrete. Tie rods shall be held in place by devices capable of developing the strength of the rod and that when removed shall leave an opening in the concrete surface not greater than 1-1/2 inches in diameter and one inch in depth. The holes shall be repaired with an approved concrete patching mixture Type S-F-HE, as specified in Sections 706 of the MDOT 2003 Standard Specifications for Construction.

3.09 CONCRETE REINFORCEMENT

Reinforcing bars

- A. Reinforcing bars and wire ties shall be furnished in accordance with the shapes and dimensions shown on the Plans. Field bending shall not be allowed except to correct minor errors.
- B. All steel reinforcement shall be accurately placed in the positions shown on the Plans, securely wire tied at all intersections and firmly held during the placement of concrete. Bar laps shall as shown and securely tied. Support footing reinforcing bars shall be placed on metal or concrete bolsters or chairs.
- C. On inside jambs of the building entrance, furnish and install two corner guard angles-4"x4"x1/4"-with standard anchors cast in the concrete. The corner guard angles shall extend the full height of exposed concrete. See DIVISION 4 - METALS for 4"x4"x1/4" angles.
- D. Footing steel and wall steel shall be GRADE 60.
- E. All steel reinforcing bars, wire ties and bar chairs shall be epoxy coated in accordance with ASTM D3963 and Section 706 of the MDOT 2003 Standard Specifications for Construction.

3.10 CAST-IN-PLACE CONCRETE

Structural Concrete

- A. All materials, equipment and construction methods shall meet the requirements as specified in the appropriate Sections 701 and 706 of the MDOT 2003 Standard Specifications for Construction.
- B. Structural concrete shall meet the following minimum requirements:

1. Concrete - Grade S1
 2. Minimum 28 days compressive strength - 4,000 psi
 3. Minimum 28 days flexural strength - 700 psi
 4. Course aggregate - 6A
 5. Cement - Portland 1A at 6.5 sacks per yard
 6. Air entrainment - 6.5% +/- 1.5%
 7. Slump - 3" to 5" maximum (with no admixtures)
 8. Approved concrete admixtures may be used in accordance with the MDOT 2003 Standard Specifications for Construction.
- C. The concrete shall be deposited in the forms in layers not more than 12 inches in thickness and as near to the final position as possible with minimum handling to avoid segregation of the materials and displacement of the reinforcement.
- D. Mechanical, high-frequency internal vibrators shall be used to consolidate the concrete during and immediately after depositing. The vibrators type shall be approved by the County/City Engineer.
- E. At the time concrete is placed, the forms and reinforcing steel shall be clean and all sawdust, chips and other debris shall have been removed from the interior of the forms.
- F. Labor and equipment shall be provided by the Contractor to produce, handle and finish the concrete for the maximum pour to be completed monolithically. The necessary equipment shall be available for inspection and approval prior to its anticipated use.

3.11 CONCRETE CURING COMPOUND

All concrete surfaces shall be treated with a transparent membrane curing compound that conforms to ASTM C 309, Type 1-D, Class B, with fugitive dye, and shall be applied at the manufacturer's recommended rate of application.

3.12 FINISHING HARDENED CONCRETE

All fins and irregular projections shall be removed from all exposed surfaces. All honeycomb areas, form tie cavities and other defects more than 1/4 inch in diameter or depth shall be cleaned and patched with an approved concrete patch mixture Type F-L and C-L-HE per Section 703 of the MDOT 2003 Standard Specifications for Construction.

3.13 EXPANSION JOINTS IN CONCRETE WALL

Furnish and install "DUO-PVC" waterstop, "DUO-PVC," NO. 9532ND, as manufactures by W.R. Meadows Inc., or approved equal, where shown on the plans.

Each side of water stop shall have 1/2" asphalt impregnated black expansion board installed in the joint.

3.14 EXPANSION JOINTS DOWELS

Expansion joint dowels shall be an epoxy coated smooth #4 dowel.

3.15 Special Concrete Finishes

See Division 6, Finishes, section 6.02

END OF SECTION 030000

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DIVISION 05 - METALS

5.01 MISCELLANEOUS STEEL

- A. Door jamb protection devices shall be a standard 6" diameter, 8' long Schedule 40 black steel pipe, solidly set in and filled with concrete. Set in 18 inch diameter x 4'-0" deep concrete filled hole. Top of concrete shall be flush with top of asphalt. The concrete at the top of the pipe shall be finished to form a smooth concrete hemisphere. Shop painting shall be one (1) prime coat and one (1) coat epoxy gloss enamel.
- B. Furnish and install two (2) 4"x4"x1/4" steel angles at the inside jamb of the doorway. Shop painting shall be one (1) prime coat and one (1) coat of epoxy gloss enamel. Coat front and back sides.
- C. Furnish and install 3"x1"x1/8" channels at sides and bottom of sliding door. Paint with (1) coat of prime coat and one (1) coat of epoxy gloss enamel, front and back sides.
- E. Anchor bolts shall be galvanized 1/2" diameter x 1'-4" long at 4'-0" centers.

5.02 METAL BOLLARDS

- A. Fabricate metal bollards from 1/4-inch wall-thickness rectangular steel tubing.
- B. Galvanize metal bollards.

5.03 PLASTIC BOLLARD COVERS

- A. 1/4" Domed High-Density Polyethylene (HDPE) tubes having ultra-violet (UV) resistance and anti-static properties, nominal thickness of .250 inches. Color to be OSHA Safety Yellow. Size appropriately for each size of bollard.
 - 1. Manufacturers:
 - a. Ideal Shield
 - b. Encore Commercial Products, Inc.
 - c. Glass City Plastics Inc.

END OF SECTION 050000

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DIVISION 06 - WOOD

6.01 WOOD PRESERVATIVE

- A. All lumber used in construction for wall plates and eave fascia -- shall be pressure impregnated with CCA 100% Oxide-pure preservative equal to "OSMOSE", conforming to American Wood Preservative Association (AWPA) Standard P5 and Federal Specification TT-W-550. The preservative shall be applied in a closed cylinder by vacuum pressure process in strict accordance with the recommended practices of AWPA Standard C2, or the appropriate standard covering the commodity treated. Retention of CCA of Oxide shall be a minimum of 0.25 pounds per cubic foot retention.
- B. Pressure treated material shall be dried to a maximum moisture content of 19 percent before installation. When framing treated lumber, all cut surfaces and bolt holes shall be liberally brushed with the same preservative before the material is installed. Ripping of pressure treated material will not be allowed.

6.02 STUDS, BUCKS AND BLOCKING

All 2" x nominal dressed lumber--for studs, beams, plates, bucks an blocking--shall be No. 2 grade or better, Southern Pine.

6.03 ROUGH HARDWARE

- A. All rough hardware items furnished and installed-- including galvanized nails, spikes, bolts, anchors, washers and screws--shall be of the size necessary to securely fasten and hold the various members in place.
- B. All rough ware shall be galvanized.
- C. Spiral type aluminum nails shall be used to secure siding.

6.04 FASCIA

Eave and gable fascia shall be 2" x 10" nominal No. 2 grade--or better--commonly stocked pressure treated species. The fascias shall be installed straight and true using 2" x 10" blocking at 4'-0" centers at gable overhangs.

6.05 WOOD TRUSS MEMBERS

- A. Design
 - 1. The roof truss design shall be certified by an engineer or architect registered in the state of Michigan. A complete set of design calculations--including all design loads, stresses, actual sizes of members, etc.--shall be furnished to the Owner.

2. The total roof truss design loads shall be indicated on the drawings.
3. Members shall be 2" x nominal Douglas fir or Southern Pine meeting the following strengths and grades unless otherwise established by the approved truss manufacturer's engineering design:
 - a. Chord Members - No. 1 select grade ($F_b = 1500$ psi)
 - b. Web Members - No. 2 select grade ($F_b = 1200$ psi)

B. Fabrication

1. All lumber used shall be dressed to standard dimensions. Truss joints shall be assembled using:
 - a. ASTM A653; Structural Steel, high-strength, low-alloy steel Type A, or high-strength low-alloy steel Type B; G185 coating; and not less than 0.036 inch thick
 - b. ASTM A666, type 304 and not less than 0.035 inch thick.
 - c. Both sides of all joints shall be gusseted. Top and bottom splice plates shall also be galvanized steel--applied on both sides of joint.
2. Cut all members to fit square and snug with adjacent members--within job assembly. Allow specified set-up time for glued members and exercise care at all time in handling each section.

C. Accessories

Each truss shall be securely fastened to wall plates by means of four hurricane anchors (Simpson H2.5 stainless steel with (10)8d stainless steel nails or equal) two at each end of the truss. The hurricane anchors shall be installed such that they are staggered at each truss bearing per the manufacturer's recommendations.

- D. Additional Truss Protection: Add 2"x4" #2 grade nailed perpendicular to the trusses across the bottom chords (bottom side) at 8 ft. centers.

6.07 ROOF DECKING

- A. Plywood deck panels shall be 3/4" exterior grade, firm, APA-CDX, group 1, or 3/4" OSB sheathing meeting these specifications. Installed with the long dimension perpendicular to the trusses. Install plywood with "C" face to the interior.
- B. All deck panels shall be applied with vertical joints staggered and nailed 6" on center at joints, and 12" on center over intermediate supports, with 8d spiral or ring shank nails.
- C. Provide ONE - 5/8" metal panel clip between each purlin, for all vertical panel joints.

END OF SECTION 060000

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

7.01 ROOFING, DRIP EDGE, AND FLASHING AND DRIP

- A. Roof shingles shall be a square tab strip shingle, UL Class “C” heavyweight, mineral surfaced, self-sealing, fiberglass/asphalt Architectural style shingle weighing not less than 240 lb. per square.
 - 1. Complete product data and samples shall be submitted to the Owner for approval and color selection.
 - 2. Roof shingles shall be installed over 15 lb. saturated felt underlayment and nailed in place. The felt underlayment may be stapled in place.
- B. The drip edge shall be 0.027" thick colored aluminum.
- C. Colored aluminum flashing and drip shall be installed on the gable ends as designed on the plans.

7.02 SEALANTS

- A. Sealing compound shall be one part acrylic copolymer meeting Federal Specifications TT-S-00230. Color to be selected by the county/municipality engineer.

The following materials are approved:

- 1. Monolasto-metric by Tremco Manufacturing Company
 - 2. 780 Building Sealant by Dow Corning Corporation
 - 3. G.E. Silicone Construction Sealant by General Electric Company
- B. The sealing compound shall be applied at:
 - 1. The track cover--located over the sliding door--as designated on the plans. The track cover shall be set into the sealant for coating.
 - 2. The aluminum flashing and drip--located between the plywood siding panels on the gable ends--as designated on the plans. The plywood shall be set into the sealant and 1/16" shall be left between the siding and metal drip.
 - 3. Around the channels located at the sliding door.

END OF SECTION 070000

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DIVISION 08 – OPENINGS

8.01 DOOR HARDWARE

Sliding door hardware shall be equal to Richard Wilcox, consisting of #376 track, brackets for #376 track spaced at 24" ctrs with end blinds, #3301-p1 trucks with 3" Dia. Steel wheels with ball bearing. Hangers to be #3301-p4. #191 bow handles, #153-p5 stay rollers, #82 steel binders, #524-p23 cane bottom bolts, and weather cover #296-p376.

8.02 SIDING AND SLIDING DOOR

- A. The siding for the building shall be 5/8" T1-11 FIR APA 303 exterior plywood, in accordance with PS-1-74--with grooves 8" o.c. and shiplap edges. Center and back plys shall be "c" grade western softwood. All panels shall be stamped with APA grade trademark.
- B. The building siding shall be glued with waterproof type construction adhesive at each stud and nailed with top of nails flush with surface.
- C. Install plyflash aluminum "Z" flashing--manufactured by Nichols-homesield, Inc.--with grooves to match Texture I-11, at the horizontal joint using aluminum nails.

8.03 OVERHEAD COILING DOOR

- A. Material: Galvanized Steel.
- B. Mounting: Interior face of wall.
- C. Bottom Bar: Two Angles.
- D. Capable of 100,000 operations.
- E. Locking Device: Slide Bolt.
- F. Electric Door Operator:
 - 1. Heavy Duty, weather-resistant, single phase, 115V/60Hz
 - 2. 3-Button operator; up/down/stop
 - 3. Emergency chain operation
 - 4. Obstruction detection via photoelectric sensor and bottom bar sensor.
 - 5. Interior and exterior mounted control stations
- G. Finish: Powder-Coated in color selected by Owner

END OF SECTION 080000

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DIVISION 09 - FINISHES

9.01 PAINTING

- A. All exterior wood surfaces--including the back side of the sliding doors--shall receive two (2) coats of stain, applied at the manufacturer's specification. The stain shall be oil-base solid color stain as manufactured by REZ. Color to be selected by owner.
- B. All bolts that have any damaged galvanized surfaces shall be painted with one (1) coat of suitable primer and one (1) coat of epoxy glass enamel.
- C. The interior "load limit line" shall be a 3" wide, orange epoxy enamel stripe, rolled onto side walls and end wall using two (2) applications. See plans for height.
- D. Miscellaneous metals shall have one coat of prime and one coat of epoxy glass enamel.

9.02 SPECIAL CONCRETE FINISH

The total vertical concrete surface of the structure interior shall be sealed with a penetrating water repellent treatment.

A. Material:

- 1. The penetrating water repellent treatment solution shall be an approved non-epoxy resin material having met the following performance criteria, based on a single application of the solution in accordance with the manufacturer's recommended rate of coverage.
- 2. The penetrating water repellent treatment solution shall not stain, discolor or darken concrete. Application of the solution shall not alter the surface texture or form a coating on concrete surfaces. Treated concrete shall be surface dry within 30 minutes after application.
- 3. Test of treated concrete specimens.

a. Absorption:

<u>Test</u>	<u>Duration</u>	<u>Max Absorption</u>	<u>Method</u>
Water	48 hours	1% by weight	ASTM C-642
Immersion	50 days	2% by weight	ASTM C-642

b. Chloride Ion Penetration:

<u>Test</u>	<u>Duration</u>	<u>Max Absorption</u>	<u>Method</u>
Salt water ponding*	90 days	1.5 lb/cu yd Depth: 1/16 in (1.16mm)	AASHTOT-259 AASHTOT-260

to 1/2 in
(13mm)

0.75 lb/cu yd AASHTO T-259
Depth: 1/2 in AASHTO T-260
(13mm) to 1
in (25mm)

* Based on non-abraded specimens

B. Equipment:

The solution shall be applied with low pressure airless type spray equipment with 15 to 40 psi (103 to 276K pa) application pressure.

C. Construction Methods:

1. Surface Preparation

- a. All concrete surfaces prepared for treatment shall be thoroughly cleaned by sandblasting prior to application of the penetrating water repellent treatment solution. All traces of curing compound, dirt, dust, salt, oil, asphalt or other foreign materials shall be removed. Unless adjacent steel surfaces are to be painted after the concrete has been cleaned, steel surfaces shall be masked to prevent damage. Should damage occur to steel surfaces, repairs shall be made in accordance with Section 6.01 above.
- b. Surface preparations may include the application of pretreatment cleaning agents prior to the use of sandblasting.
- c. If necessary, solvents and hand tools shall be used as required to remove bonded materials detrimental to treatment of the concrete surface.

2. Weather Limitations

The penetrating water repellent treatment solution shall not be applied when the air or concrete surface temperature is less than 40 degrees F (4° C) or otherwise below or above the manufacturer's recommended application temperature range. The solution shall not be sprayed when blowing winds or other conditions prevent proper application.

3. Application

- a. The penetrating water repellent treatment solution shall be used as supplied by the manufacturer and not diluted or altered in any way. The solution shall be sprayed onto concrete surfaces at the manufacturer's recommended rate of coverage.

- b. Surface treatment of new concrete shall not begin until it has cured for at least 7 days. During the final 48 hours of this period the concrete shall be allowed to air dry.

D. RECOMMENDED SUPPLIERS

<u>Producer</u>	<u>Product</u>	<u>Application Rate</u>
Jeene Technology of Mich. 1900 Chicago Dr. S.W. Grand Rapids, Mi. 49509 (616) 245-2300	Enviroseal	40 1 coat 150 SF/Gal.
Jeene Technology of Mich. 1900 Chicago Dr. S.W. Grand Rapids, Mi. 49509 (616) 245-2300	Hydrozo 40	1 coat 150 SF/Gal.
Form-Tech 560 56th. street s.w. Grand Rapids, Mi. 49548 (616) 249-3000	Conspec	1 coat 150 SF/Gal.
Form-Tech 48575 Downing Rd. Wixon, Mi. 48393 (810) 344-8260	Conspec	1 coat 150 SF/Gal.
Form-Tech 560 56th. Street S.W. Grand Rapids, Mi. 49548 (616) 249-3000	Stifel	1 coat 150 SF/Gal.
Concrete Central 1301 Century S.W. Grand Rapids, Mi. 49509 (616) 475-8500	Pentane 20 @ 40	1 coat 150 SF/Gal.

END OF SECTION 090000

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DIVISION 26 - ELECTRICAL

26.01 DESCRIPTION

This section outlines basic materials and installation methods for the provision of electrical service, electrical distribution, lighting, and exhaust ventilation.

26.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agency:

1. Compliance with the National Electrical Code--current edition.
2. Compliance with federal and local regulations.
3. Acquisition of and payment for permits and certificates of inspections as required by governing authorities.
4. The Michigan Department of Labor, Bureau of Construction Codes, shall be the inspection authority.

B. Referenced Standards:

1. The following standards and codes are cited:
 - a. American National Standards Institute (ANSI)
 - b. National Electrical Manufacturers Association (NEMA)
 - c. Underwriters Laboratories (UL)
 - d. Electrical Testing Laboratories (ETL)

26.03 ELECTRICAL SERVICE

- A. Service shall be 120/240 volt, single phase, 70 ampere, 60 hertz.
- B. Service shall be fed underground from a new utility service drop north of the proposed building. Excavation shall be performed by the electrician from the building to the meter.
Provide compacted backfill for entire length of trench. Provide sleeves at building as required. The electrical contractor shall make all arrangements with the local utility "Consumers Energy" before construction is started.
- C. Underground feeder conductors shall be three (3) #3 THW and one (1) #8 ground in 2" Carlon Type 40 conduit. Install conduit two (3) feet below finish grade with magnetic marker tape similar to "Allen Detect Tape" in trench above conduit Provide

one (1) 70 ampere, two pole circuit breaker in the new panel. Provide a 2P-100A Nema 3R Heavy Duty fused disconnect at the service meter with a pair of 70A, type LPN fuses.

- D. Service panel shall be square D, Type QO, rainproof, QO30M 100RB, complete with 70 ampere, 2 pole main circuit breaker and additional branch breakers as listed on the panelboard schedule on the plans. The service panel shall be mounted on the Salt Storage Building. The panelboard must be suitable for use as service equipment.
- E. The grounding material shall be three(3) 3/4" x 8'-0" copper clad ground rods--as shown on the plans--with #6 copper service ground connected to the ground rods using blackburn, Type GG34H clamps.

26.04

MATERIAL AND DEVICES

- A. Plastic conduit shall be polyvinyl chloride (PVC) UL labeled and "NEMA,EPC-40-PVC" heavy wall rigid, standard radius elbows and conduit supports PV-Duit snap straps as manufactured be Carlon or approved equal.
- B. Switch boxes and fixture outlet boxes shall be polyvinyl chloride, U.L. labeled with compatible fitting and supports as manufactured by Carlon or approved equal.

- C. Light Fixtures:

Exterior: Equal to Cooper- Lumark XTOR9ARL-PC1- photoelectric control, mounted above the sliding door as shown on the plans. This is an LED wallpack With a dropped refractive lens, die cast aluminum outdoor construction.

Interior: Equal to Cooper VT-LD2-58DR-UNV-L840-CD2-WL-SSL. Specifications consist of a LED linear enclosed and gasketed fixture, prismatic acrylic reflector, multi-tap ballast, and surface mounting. This fixture is designed for use in corrosive influences and shall be mounted as shown on the plans with the bottom of the light not to protrude below the bottom of the truss chord.

Spacing: Two rows of lights shall be spaced at 20 foot intervals, starting 20 feet away from the back wall and placement at equal spacing up to the front wall. The two rows shall be located 20 feet away from the side walls.

- D. Exhaust Fans

- 1. Fans shall be 48" belted panel fans as manufactured by Cook (Catalog Number 48XMPH) or approved equal. Each fan shall have a capacity of 15,165 CFM at 0.125 inch static pressure standard air and be equipped with a 1½ horsepower totally enclosed, maintenance free, motor, 414 RPM, 230 Vlt, 1-Phase, 60 Hertz rated for 40 deg. C ambient temperature. Standard features include X-stream steel propeller, propeller hub keyed to shaft, continuously welded wall panel covers, galvanized steel wall housing, adjustable mounting angle, galvanized steel wire guard, galvanized exhaust shutter, lorenized powder paint finish,

- corrosion resistant fasteners, 14 gauge steel venture, permanently lubricated ball bearing motor, regreasable bearings in a cast housing rated at 200,000 hours average life and adjustable pitch drive.
2. The units shall be equipped with a wall-mounted collar, OSHA motor side guard, and weatherhood with bird screens as manufactured by Cook or approved equal.
 3. Buildings of 6000 sft. or less shall have two fans. For every increase of 4000 sqft. in building size, one additional fan shall be added.
 4. Fans shall be equally spaced in rear of building. If there are more than three fans, they will be placed as directed by the engineer.
- E. Receptacle for exhaust fans shall match the fan electrical requirements for installation in FS type box.
- F. Time Switches shall be M.H. Rhodes, Inc., Mark-Time 3 hour time switch catalog No. 933 Series, which will control interior lights and exhaust fans. Provide one time switch for the exhaust fans and a separate time switch for the lighting.
- G. Weatherproof receptacle shall be NEMA 5-20R, rated for 20 AMP 125V AC with 3 wire grounding, specification grade equal to 53M61GY with Hubble 7423 plate.
- H. Wire and Cable Conductors shall be NEC, Type THW, or THWN copper, 600volt, 75°C. Minimum wire size shall be #12 AWG.
- I. Distribution panel shall have circuits as shown on panelboard schedule.
- J. Magnetic starters for the exhaust fans shall be square D class 8503, with 120V coil controlled by manual timed override switch as shown above. Starters shall be in fiberglass enclosure.
- K. Lighting and fan time switch enclosure shall be Robroy (Stahlin), polycarbonate cover on fiberglass enclosure, and shall be weather tight. Mount where directed by owner and label each switch with engraved plastic laminate.
- L. The electrician shall furnish the concrete Contractor with plastic sleeves for conduit openings to service panel.
- M. The electrician shall furnish and install proper anchors for conduit and fixture outlet boxes--located at the center of the wood trusses.

26.05 GUARANTEE

The contractor shall guarantee all labor and material for a period of one year from date of final acceptance. The contractor shall make all alterations, repairs, and/or replacements of

defects in labor and materials when so directed by the City/County Engineer, at the contractor's expense without cost to the Owner.

END OF SECTION 260000

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SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and removing site utilities or abandoning site utilities in place.
 - 7. Temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

- A. MDOT: Michigan Department of Transportation's Standard Specifications for Construction, 2012.
- B. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- C. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.
- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings defined by a circle concentric with each tree with radius as indicated.

- G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or videotape.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- A. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises. Coordinate with Owner to verify exact location for storing salvaged items.
- B. Utility Locator Service: Notify utility locator service for area where Project is located at least three (3) days before site clearing. "Miss Dig" (800) 482-7171 or "811".
- C. Maintaining Drainage: Existing open drains, field and roadway ditches, drainage tile, sewers enclosed drains, natural and artificial watercourses, surface drainage or any other types of drainage with the limits of the work shall be maintained and free to discharge during construction.
 - 1. Drainage facility not designated to be abandoned, but which is damaged, or any drainage interrupted by the Contractor's operation shall be immediately repaired, replaced, or cleared by the Contractor.
 - 2. Costs incurred shall be incidental to the excavating, backfilling and compacting or grading operations.

- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
 - 1. Contractor shall provide, maintain and remove temporary and permanent soil erosion and sedimentation control measures as specified or as determined by the Architect.
 - 2. Soil erosion and sedimentation control measures shall prevent surface run-off from carrying excavated materials into the waterways, to reduce erosion of the slopes, and to prevent silting in of waterways downstream of the work.
 - 3. Measures should include provisions to reduce erosions by the wind of all areas stripped of vegetation, including material stockpiles.
- E. The following practices are prohibited within protection zones identified on the Drawings:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- H. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Protect and maintain benchmarks and survey control points from disturbance during construction. If survey control points or benchmarks will be disturbed, establish new points prior to removal.
- C. Locate, field verify, and protect existing septic tank, drain tile, septic field/bed tiles located west of and adjacent to the work.
 - 1. Coordinate with Calhoun County Road Department Project Manager.
- D. Locate and protect existing monitoring/observation wells from removal and damage.
- E. Locate and clearly identify trees, shrubs, and other vegetation to remain.
- F. Protect existing culverts, sewers, drainage structures, manholes, water gate wells, hydrants, water mains, utility poles, overhead lines, underground conduits, underground cables, pavement, or other types of improvements within the construction limits, not designated on the plans to be removed, shall be carefully protected from damage during the construction operations.
- G. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways, and streets according to erosion- and sedimentation-control Drawing, and as required by Calhoun County Road Department Soil Erosion and Sedimentation Control Permit requirements.
- B. Contractor shall sweep existing Greenway Drive as needed to remove any sediment tracked off site. Frequency of sweeping will be based on site conditions.
- C. All stockpiled and excavated materials will be surrounded by silt fence if left over night outside a protected area.
- D. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- E. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- F. After project completion, remove temporary erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.4 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site. Where roots are encountered from trees to remain, cut roots cleanly at excavation limits.
- B. Replace trees, shrubs, and other vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect and Owner.

3.5 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Contractor shall arrange to shut off indicated utilities.
- B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
- C. Existing sanitary sewers, storm sewers, drain tile, septic tank, septic field/bed tiles, water mains or building services or leads, that are encountered during the performance of the work that require relocation or are damaged, shall be restored with new materials equal in quality and type to the materials encountered.
 - 1. Seepage bed tile and water mains shall be replaced in accordance with the requirement of the agency having jurisdiction.
 - 2. Relocation or protection of existing sewers, tiles, tile field, water mains or building services and leads shall be at the Contractor's expense, unless otherwise indicated in the Contract Documents.

3.6 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Completely remove stumps and remove roots, obstructions, and debris.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.7 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered or as required to obtain suitable subbase material for installation of improvements in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 1 inches in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches.
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.8 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. The site shall be graded to provide surface drainage and shall be left in a clean condition.

END OF SECTION 31 10 00

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SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. CAD files will be made available for use in construction staking. Contact the Architect regarding applicable fee and requirements for signing of the CAD Information Request.

1.2 SUMMARY

- A. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. Section Includes:
 - 1. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses and plants.
 - 2. Excavating and backfilling for all depressions/voids created from the demolition and removal of the structures, utilities, pavement, and vegetation.
 - 3. Excavating and backfilling for buildings and structures.
 - 4. Compacted aggregate course for concrete slabs-on-grade.
 - 5. Subbase course for concrete walks and pavements.
 - 6. Subsurface drainage backfill for walls and trenches.
 - 7. Excavating and backfilling trenches for utilities and pits for buried utility structures.
- C. Related Sections:
 - 1. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
 - 2. Divisions 22, 23, 26, 27, and 33 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.
 - 3. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
 - 4. Section 3150000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

1.3 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.

- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. MDOT: Michigan Department of Transportation's Standard Specifications for Construction, 2012.
- H. Pavement: Walks, drives, roads, and parking areas, to include all asphalt, concrete, brick and aggregate pavement.
- I. SESC: Soil Erosion and Sedimentation Control as required in the Drawings and elsewhere in these Specifications.
- J. Structures: Footings, foundations, slabs, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, topsoil materials or over excavated materials.
- M. Undercut: Excavation of native material from below the bottom of footings, floors, structures, and subbases.
- N. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:

1. Geotextiles, if required for the project.
 2. Controlled low-strength material, including design mixture, if required for the project.
 3. Warning tapes if required for the project
- B. Qualification Data: For qualified testing agency.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site/off-site borrow soil material proposed for fill and backfill.
 2. Laboratory compaction curve according to ASTM D 1557 for each on-site/off-site, borrow soil material proposed as Fill and Backfill.
 3. Gradation test reports according to ASTM C 136.05 to determine compliance with the gradation requirements stated herein.
- D. Field Compaction Test Reports: From a qualified testing agency indicating and interpreting test results for the compliance with the compaction of Backfill and Fills requirement of 95% of modified proctor.
1. All test reports shall be provided to the Owner Representative prior to payment for the backfill related work.
- E. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.
- B. The Owner will secure and pay for the services of a qualified, independent geotechnical engineer to classify existing soil materials, to recommend and to classify proposed borrow materials when necessary, to verify compliance of materials with specified requirements, and to perform required field and laboratory testing. Geotechnical engineer shall be acceptable to the Architect and the Owner and shall be licensed to practice in the state of Michigan.

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner's Representative or others unless permitted in writing by Project Manager and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Owner's and Utility's (if different) written permission.
 3. Contact utility-locator service for area where Project is located before excavating.

- B. Utility Locator Service: Notify utility locator service “Miss Dig” (800) 482-7171 (or “811”) for the area where the Project is located three days before beginning earth-moving operations.
- C. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
 - 1. Soil materials provided to meet Michigan Department of Transportation “2012 Standard Specifications for Construction”, Section 902 - Aggregates.
- B. Satisfactory Soils: For backfill and fill, soils complying with Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. MDOT Class I, II, or 2NS.
 - 1. Satisfactory soil for backfill (Engineered Fill) beneath over excavated areas supporting structures shall be meet MDOT Class II sand.

- C. Unsatisfactory Soils: For backfill and fill, soils complying with Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve. MDOT Class I, II, or 2NS.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve. MDOT Series 21, 22, or 23, with less than 8% loss by washing.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve. MDOT Class I,II, or 2NS.
 - 1. On-site granular deposits within the excavation can be used as engineered fill if approved by the geotechnical engineer and if selective excavation procedures area employed to manage existing clay deposits.
 - 2. Import fill as required to make up volumes necessary to raise the building site.
 - 3. Satisfactory soil for backfill (Engineered Fill) beneath over excavated areas supporting structures shall be meet MDOT Class II sand.
- G. Utility Bedding or Backfill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve. MDOT 6A Crushed Limestone.
- H. Granular Materials: In accordance with MDOT Section 902 for Granular Materials for Fill and Subbase, except no foundry sand is permitted.
- I. Dense-Graded Aggregate: In accordance with MDOT Section 902 for Dense-Graded Aggregates for Base Course, Shoulders, Approaches and Patching.
 - 1.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum.
 - 1. Verify that survey benchmarks and intended elevations for the Work are as indicated.

- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- C. Protect and maintain erosion and sedimentation controls during earth moving operations.
- D. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protective insulating materials before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
 - 3. Cover excavations to prevent the accumulation of storm water.

3.3 EXPLOSIVES

- A. Explosives: Explosives are prohibited for use on the Project site.

3.4 EXCAVATION, GENERAL

- A. General: Excavation includes the removal of any materials necessary to achieve the required subgrade elevations and includes reuse or disposal of such materials.
- B. Unnecessary Excavation: The expense of excavation materials outside of the limits indicated or ordered in writing by the Architect and the correction thereof to the satisfaction of the Architect shall be borne by the Contractor.
 - 1. Unnecessary excavation under footings: Either deepen footings to bear on actual subgrade elevation without changing top elevations or place concrete fill up to required elevation, as required by Architect.
 - 2. Unnecessary excavation other than under footings: Either place compacted fill or otherwise correct conditions, as required by the Architect.
- C. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- D. Depression caused by excess excavation, traffic or rolling shall be filled with MDOT 902 Granular Material Class II or approved fill and rerolled and compacted in place as specified herein.
- E. If required because of excess water conditions, place stone stabilization course prior to proceeding with construction. Place filter fabric over stone stabilization course.
- F. Approval of Subgrade: Notify the Testing Agency when required elevations have been reached.
 1. When required by the Architect due to the unforeseen presence of unsatisfactory materials or other factors, perform additional excavation and replace with approved compacted fill material in accordance with the Architect's or geotechnical engineer's instructions.
 2. Payment for unforeseen additional work will be made in accordance with established unit prices or, if none, in accordance with provisions for changes in the work. No payment will be made for correction of subgrades improperly protected against damage from freeze-thaw or accumulation of water, or for correction of otherwise defective subgrades.
- G. Excavation Stabilization: Slope faces of excavations to maintain stability in compliance with requirements of governing authorities. Do not use shoring and bracing where faces can be sloped.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line unless otherwise indicated.

- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: 6 inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe. Remove projecting stones and sharp objects along trench subgrade.
 - 1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE PREPARATION AND INSPECTION

- A. Perform mass earthwork operations to remove all existing topsoil and other organic materials in their entirety within the footprint of the proposed building and pavement areas. Buried objects shall be removed in their entirety.
- B. Notify Owner's On-site Geotechnical Engineer Representative when excavations have reached required subgrade elevations.
- C. Proof-roll subgrade below the structures and pavements with a heavy pneumatic-tired vehicle, such as a loaded dump truck or loader to identify soft pockets and areas of excess yielding and pumping in the presence of the Owner's On-site Geotechnical Engineer Representative. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction repeating proof-rolling in direction perpendicular to the first direction. Limit vehicle speed to 3 mph.
 - 2. Proof-roll subgrade with heavy pneumatic-tired equipment or loaded 10-wheel, tandem axle truck weighing not less than 15 tons.
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Testing Agency, and replace with engineered fill as directed.
- D. If Owner's On-site Geotechnical Engineer Representative determines that unsatisfactory soil is present, continue excavations and replace with compacted backfill or fill materials as directed.
 - 1. Additional excavation and replacement materials will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner's On-site Geotechnical Engineer Representative and Owner's Representative, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean

concrete fill, with 28-day compressive strength of 2500 psi, may be used at no additional cost to the Owner.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials in designated area away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.12 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material, unsatisfactory excavated soil classification groups GC, SC, ML, and CL, or approved borrowed material.
 - 2. Under walks and pavements, use satisfactory soil material as long as the geotechnical engineer deems the material to be suitable and the compaction requirements can be met.
 - a. If material is deemed unsuitable, use engineered fill.
 - 3. Under steps and ramps, use engineered fill (granular material, MDOT Class II).
 - 4. Under building slabs, use engineered fill (granular material, MDOT Class II).
 - 5. Under footings and foundations, use engineered fill (granular material, MDOT Class II).
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within two (2) percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. No backfill shall be placed without it being compacted in place. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
 1. Granular, non-cohesive soils shall be compacted with mechanical tamping or vibration-type compactors. Sand may be compacted by flooding the trench when water is available.
 2. When clays are encountered, a mechanical tamper or sheeps-foot roller shall be used to compact the soil. Manual mechanical tamping equipment shall have a rammer which weighs not less than 20 pounds and has surface area of not more than 36 square inches. Hand compaction is not acceptable.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift.
- C. Existing Utilities: Where existing utilities are required to be tunneled under, the area under the utility shall be filled with compacted sand, and have the pipe embedment reconstructed as for new piping.
- D. Pipe Embedment: New piping shall be laid on Utility Backfill and Bedding material compacted to maximum thickness of 6 inches. Dig holes in bedding for bells and fittings so pipe bears uniformly along its length. Hand compact the haunching under the spring line of the pipe. Take extra care to control the density of the haunching on plastic pipe in accordance with the manufacturer's instructions.
- E. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 1. Under structures, building slabs, steps, and pavements: Scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95% or greater.
 2. Lawn or Unpaved Areas: Scarify and recompact top 6 inches of subgrade and compact each layer of backfill or fill soil material to 80-85% maximum density.
 3. Walkways and ramps: Compact top 6 inches of subgrade and each layer of backfill or fill material to 90% or greater.
 4. Fill Under Existing Utilities: Compact top 6 inches of subgrade and each layer of backfill or fill material to 95% or greater.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
 - 2. Walks: Plus or minus 1 inch.
 - 3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.
- D. Contractor shall confirm that the proposed grades shown on the plans will not create a ponding water condition (i.e. an unintended low spot or pavement grades less than 1%).

3.16 SUBSURFACE DRAINAGE

- A. Drainage Piping: Drainage pipe is specified in Division 33 Section "Subdrainage" for foundation drainage and under-slab drainage systems.
- B. Subsurface Drain: Place a layer of drainage fabric around perimeter of drainage trench. Place a 6 inch course of filter material on drainage fabric to support drainage pipe. Encase drainage in a minimum of 12 inches of filter material and wrap in a drainage fabric, overlapping sides and ends at least 6 inches.
 - 1. Compact each course of filter material to 95 percent of maximum dry unit weight according to ASTM D 698.
- C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade. Overlay drainage backfill with one layer of drainage fabric overlapping sides and ends at least 6 inches.
 - 1. Compact each course of filter material to 95 percent of maximum dry unit weight according to ASTM D 698.

3.17 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. If indicated on the plans or deemed necessary by the geotechnical engineer, install separation fabric on prepared subgrade according to the manufacturer's written instructions, overlapping sides, and ends.

- C. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 - 1. Shape subbase course and base course to required crown elevations and cross-slope grades.
 - 2. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness.
- D. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layers to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.18 COMPACTED AGGREGATE UNDER CONCRETE SLABS-ON-GRADE

- A. Place compacted aggregate on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact aggregate under cast-in-place concrete slabs-on-grade as follows:
 - 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place compacted aggregate 6 inches or less in compacted thickness in a single layer.
 - 3. Place compacted aggregate that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 4. Compact each layer of compacted aggregate to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency: Owner shall engage a qualified independent geotechnical engineering testing agency (Owner's On-site Geotechnical Engineer Representative) to perform field quality-control testing.
- B. Allow Owner's On-site Geotechnical Engineer Representative to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Excavation Subgrade: At excavation subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other excavation subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by geotechnical engineer and Architect.

- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations, frequencies, and each Fill and Backfilled layer:
 - 1. General excavation areas
 - a. At sub-grade and at each compacted Fill and Backfill layer, at least one test for every 5,000 sq. ft.
 - 2. Under Paved Areas
 - a. Each compacted sub base and base course layer, at least one test per every 1,000 sq. ft.
 - 3. Building Areas, Structure Areas and Foundation Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2500 sq. ft. or less of building slab area, but in no case fewer than three tests per layer.
- E. When testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; re-compact and retest until specified compaction is obtained.

3.20 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and re-compact. Additional Compaction tests may be required for repaired or reestablished grades as determined by the Owner. Tests shall be performed by an independent testing agency at the Contractor's expense.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
 - 1. Do not burn materials on the Owner's property.

3.22 CLEAN-UP

- A. The Contractor shall perform daily maintenance and cleanup of construction materials and debris tracked on and off site. Materials and debris that accumulate and are not removed or maintained after a 24-hour notification of a violation by the Owner, may be separately contracted by the Owner and all associated costs will be charged to the Contractor.

END OF SECTION 31 20 00

SECTION 31 50 00 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work of this Section shall include all labor, material, equipment, and related services necessary to design, furnish and install excavation support systems as required for construction and as specified herein.
- B. Excavation support system Work includes but is not limited to protection of existing buildings, streets, walks, utilities and other improvements and excavation against loss of ground or caving embankments and prevent Work from occurring outside of Work limits.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section includes temporary excavation support and protection systems as required by Contractor to complete construction.

1.4 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Contractor Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer licensed in the State of Michigan, using performance requirements and design criteria indicated.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, structures, trees and site improvements adjacent to excavation.
 - 4. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles, and calculations for excavation support and protection system.
- B. Shop Drawings: For excavation support and protection system.
1. Submit drawings, certified by an Engineer Licensed in the State of Michigan, describing the methods for shoring and sheeting of excavations. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and complete removal.
 2. Include plans, elevations, sections, and details.
 3. Show arrangement, locations, and details of soldier piles, piling, lagging, tiebacks, bracing, and other components of excavation support and protection system according to engineering design.
 4. Include a written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation.
- C. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements." Qualification Data: For qualified professional engineer.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified professional engineer responsible for preparation and design of excavation support and protection system.
- B. Other Informational Submittals:
1. Videotape: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
 2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.7 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.
1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
 - a. Geotechnical report.
 - b. Existing utilities and subsurface conditions.
 - c. Existing trees to be protected.
 - d. Proposed excavations.
 - e. Proposed equipment.

- f. Monitoring of excavation support and protection system.
- g. Working area location and stability.
- h. Removal of excavation support and protection system.

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 - 1. Notify Owner no fewer than three days in advance of proposed interruption of utility.
 - 2. Do not proceed with interruption of utility without Owner's written permission.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.
 - 1. The geotechnical report is included elsewhere in the Project Manual.
- C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36, ASTM A 690, or ASTM A 992.
- C. Steel Sheet Piling: ASTM A 328, ASTM A 572, or ASTM A 690; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of size and strength required for application.
- E. Tiebacks: Steel bars, ASTM A 722/A 722M.
- F. Tiebacks: Steel strand, ASTM A 416/A 416M.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at locations indicated on Shop Drawings and secure to soldier piles.

3.3 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not

more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

- A. Drill, install, grout, and tension tiebacks.
- B. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
 - 1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.
- C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.5 BRACING

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
 - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
 - 2. Install internal bracing if required to prevent spreading or distortion of braced frames.
 - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks daily during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Owner's Representative if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
- B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.
- C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.7 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Fill voids immediately with approved backfill compacted to density specified in Division 31 Section "Earth Moving."
2. Repair or replace, as approved by Owner's Representative, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 31 50 00

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. This Section includes the following:
 - 1. Hot-mix asphalt paving.
 - 2. Hot-mix asphalt patching
 - 3. Pavement marking paint.
- C. Related Sections include the following:
 - 1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement.
 - 2. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants and fillers at paving terminations.

1.3 DEFINITIONS

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.
- B. MDOT: Michigan Department of Transportation's Standard Specifications for Construction, 2012.

1.4 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements in accordance with Section 501 of the MDOT Standard Specifications for Construction, 2012.

1.5 SUBMITTALS

- A. Product Data: Contractor shall confirm that the materials provided meet the required specifications, and provide material certification to the Architect. Material certification shall

state that the products meet or exceed the requirements indicated on the plans and the requirements of the regulating authority.

1. Job-Mix Designs: Previously approved by MDOT, for each job mix proposed for the Work.
 - a. Michigan DOT Form 1931
2. Aggregates:
 - a. Certification that aggregates used in HMA mix meet MDOT specifications.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
 1. Manufacturer shall be a paving-mix manufacturer registered with and approved by MDOT.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.
- C. Regulatory Requirements: Comply with MDOT current Standard Specification for Construction for asphalt paving work.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 1. Prime and Tack Coat: Minimum surface temperature of 60 deg F.
 2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
 3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: Conform to the MDOT 2012 Specification, Section 902, 902.09 – Aggregate General Requirements for HMA Mixtures.

- B. Fine Aggregate: Conform to the MDOT 2012 Specification, Section 902, 902.09 – Aggregate General Requirements for HMA Mixtures.
- C. Mineral Filler: Conform to MDOT 2012 Specification, Section 902, 902.11 – Mineral Filler for HMA Mixtures.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: Conform to MDOT 2012 Specification, Section 904, 904.03, A., Table 904-2, PG 64-22
- B. Tack Coat: Conform to MDOT 2012 Specification, Section 904, 904.03 C., Table 904-4, SS-1h.
- C. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Pavement-Marking Paint: Per the requirements in the Michigan Department of Transportation’s “2012 Standard Specifications for Construction”, Section 920. Refer to Division 32 Section 321723 Pavement Marking
 - 1. Color: As specified on the Drawings, if required for the project

2.4 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by MDOT in accordance with the 2012 Standard Specifications for Construction and complying with the following requirements:
 - 1. Base Course: See cross-sections and details on Drawings.
 - 2. Surface Course: See cross-sections and details on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction. Proof roll as indicated in Section 312000 “Earth Moving”
- D. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.3 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of ¼ inch minimum or as indicated.
 - 1. Use hot-applied joint sealant to seal cracks and joints more than ¼ inch wide. Fill flush with surface of existing pavement and remove excess.

3.4 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Prime Coat: Apply uniformly over surface of compacted unbound aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course and leveling course in number of lifts and thicknesses indicated.
 - 2. Place hot-mix asphalt surface course in single lift and thickness indicated.
 - 3. Spread mix at minimum temperature of 250 deg F.
 - 4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
 - 5. Compact pavement by rolling to density specified. Re-roll as necessary to achieve even and smooth finish without roller marks.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 - 4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
 - 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 - 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
- C. Confirm minimum 1% slopes (cross-slope or running slope) on asphalt pavement surfaces. Notify Architect prior to asphalt placement if minimum 1% slope is not met in any direction.

3.9 PAVEMENT MARKING

- A. Refer to Specification Section 321723 "Pavement Marking", if required for the project.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
- F. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
- G. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 1. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
 2. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- H. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.11 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 1. Do not allow excavated materials to accumulate on-site.

END OF SECTION 32 12 16

SECTION 32 92 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. Section Includes:
 - 1. Seeding.
 - 2. Turf renovation
 - 3. Erosion-control material(s)
- C. Related Sections:
 - 1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
 - 2. Section 312000 "Earth Moving" for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

- G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- H. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

- A. Product Data: For each product indicated
 - 1. Seed Labels: Submit seed labels from bags showing mix composition
 - 2. Fertilizer

1.5 QUALITY ASSURANCE

- A. Qualifications.
 - 1. Installer Qualifications: The work of this section shall be performed by a contractor specializing in seeding lawn installations and turf maintenance.
- B. Regulatory Requirements.
 - 1. All seed shall comply with applicable sections of the following references:
 - a. Federal Seed Act
 - b. Michigan Seed Law
 - c. Association of Office Seed Analysts (AOSA): "Rules for Testing Seed".
- C. Certifications:
 - 1. Grass Seed: Submit certification from seed vendor for each grass seed mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging. Include identification of source and name and telephone number of supplier.
 - 2. Pesticide Applicator: Provide information on state commercial pesticide business license and commercial pesticide application certification.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed in vendor's original unopened packages bearing the manufacturer's labels. Store in a cool dry location. Replace any seed damaged during storage.
- B. Fertilizers and other chemicals delivered to the site must be in a clearly, labeled, unopened containers showing weight, analysis, and name of manufacturer.
- C. Straw mulch shall be stored off the ground under a cover that provides protection from moisture and humidity.

1.7 PROJECT CONDITIONS

- A. Planting Season:
 - 1. Seeding: Optimal and preferred seeding period is August 15 through September 15. Alternative seeding period is April 15 through May 30.
 - 2. Seeding outside the specified windows will only be permitted if approved in writing by the Architect prior to installation.

1.8 SATISFACTORY TURF AND ACCEPTANCE

- A. Turf installations shall meet the following criteria as determined by Architect:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.
- C. Final Acceptance: Final acceptance inspection of lawn areas will be made one year after Substantial Completion or during the following September for fall plantings.

PART 2 - PRODUCTS

2.1 SEED

- A. Seed.
 - 1. Seed shall be fresh, clean, dry, new-crop seed complying with the AOSA’s “Rules for Testing Seed”, tested for purity and germination tolerances.
- B. Type

MDOT (Michigan Department of Transportation) TUF-Turf Urban Freeway seed mix to be applied at 6 pounds per 1000 sf.

Variety	Proportion By Weight	Purity	Germination
Kentucky Bluegrass	10%	98	80
Perennial Ryegrass	20%	90	80
Hard Fescue	20%	98	90
Creeping Red Fescue	40%	95	90
Fults Salt Grass	10%	95	90

Maximum weed content shall be 30%

1. Other cultivars may be substituted for approval by Architect, but they must be newer, more improved cultivars than what is listed.

2.2 FERTILIZERS

1. Fertilizer shall be a complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, not less than 30% of the nitrogen from a slow release source. Fifty percent of the nitrogen shall be derived from natural organic sources. The percentages by weight shall be determined per recommendations of the soil testing reports for lawns.

2.3 STRAW MULCHES

- A. Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Straw shall be in an airy dry condition and suitable for placing with commercial mulch blowing equipment.

2.4 WATER

- A. Source: Water shall be provided by the Contractor.
- B. Quality: Water shall be free of substances harmful to plant growth.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor must examine the areas and conditions under which all items are to be installed and notify the Architect in writing of conditions detrimental to the proper and timely completion of the work. Lawn installation will not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the Architect.
- B. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
- C. Suspend spoil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
- D. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

3.2 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.

1. Areas identified for intermediate temporary soil stabilization shall not be prepared with topsoil. Contractor shall review temporary stabilization areas with Architect.

B. Grade Preparation.

1. Maintain rough grades in the areas to be topsoiled in a uniform condition so as to prevent future depressions. Prior to placing topsoil, repair disturbances to previously graded areas and remove surplus subgrade material associated with any landscape construction. Scarify areas to a depth of 6 inches prior to topsoil placement. Scarifications shall have a maximum 2 foot separation and be cut in two directions, one perpendicular to the other.
2. If the prepared grade is eroded or compacted by rainfall prior to fertilizing, rework the surface as specified. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
3. Soil Amendments.
 - a. Amend soil with lime or sulfur as recommended by soil tests, working it into the top 4 inches of soil at same time as fertilizer application.
4. Fertilizer.
 - a. Uniformly distribute fertilizer by mechanical means at the rate recommended by soil tests.
 - b. Uniformly distribute fertilizer by mechanical means at the rate of 10 pounds of 10-10-10 per 1,000 square feet (to make 1 pound of actual nitrogen per 1,000 square feet).
 - c. Work fertilizer into the top 4 inches of soil. Cultivating equipment shall be set so that the fertilizer will not penetrate into the soil more than 4 inches. Do not apply fertilizer when there is a possibility of rain before lawn areas can be seeded.

C. Placing Topsoil

1. Uniformly distribute topsoil on lawn areas so that after compaction and finish grading, topsoil depth is (4"). Placement shall include spreading, cultivating, lightly compacting, dragging and grading to the conditions specified below.
2. Topsoil, when placed, shall be dry enough so as not to puddle or bond. Do not place topsoil when the subgrade is frozen, excessively wet, extremely dry or in a condition otherwise detrimental to proper grading or lawn operation.
3. Immediately before seeding scarify, loosen, float, and drag topsoil as necessary to bring it to the proper condition. Remove all foreign matter larger than 1 inch in diameter.

D. Finished Grades

1. Finished grades shall slope to drain, be free of depressions or other irregularities after thorough settlement and compaction of soil, and shall be uniform in slope between grading controls and the elevations indicated.
2. Finished grade for seeded lawn areas shall meet existing grades at contract limits and be ½ inch below top of curbs, walk paving, and metal edging if used.

3.3 SEEDING

- A. Do not sow seed when weather conditions are unfavorable, such as during drought or high winds.

- B. Perform seeding using an approved drop spreader/seeder with cultipacker.
- C. Sow the seed uniformly at a rate of 4 lbs/1000 square feet. All areas shall be seeded in at least two directions, one perpendicular to the other. Turfgrass seeds shall not be covered by more than ¼ inch of soil. The seeding device shall lightly roll the seed bed to provide good moisture contact between the seed and soil.
- D. Water thoroughly and immediately with a fine mist until soil is soaked to a depth of 2 inches. Puddling of water or allowing the seedbed to dry is unacceptable.
- E. Spread straw mulch evenly at the rate of 2 tons per acre. Place all mulch on given areas within 24 hours after seeding. A mechanical blower may be used to apply mulch material, provided the machine has been specifically designed and approved for this purpose. Anchor the mulch by either using a crimping device or applying tackifier on the mulched surface. When tackifier is used, it may be applied either simultaneously or in a separate application. Take precautionary measures to prevent tackifier materials from marking or defacing structures, pavements, utilities, or plantings.
- F. Maintain soil in a moist condition (in hot dry weather irrigation may be required 2-4 times per day) until seeds have sprouted and reached a height of 1 inch. Water thereafter a minimum of once every 2-3 days unless natural rainfall has provided equivalent watering. Provide irrigation to moisten soil to a depth of 4 inches to encourage deeper rooting.

3.4 TEMPORARY SOIL STABILIZATION

- A. On disturbed areas that will not receive final landscape/plant material installation or final seeding within two weeks of being disturbed, the Contractor shall provide temporary soil stabilization. Contractor shall apply straw mulch to all exposed areas after scarifying and fine grading takes place.
- B. Spread a loosely applied layer of clean, chopped straw at the rate of 2 tons/acre (90 lbs/1000 square feet) to form a continuous blanket 1-1/2" in loose thickness.

3.5 TURF RESTORATION

- A. Paved areas over which hauling operations have been conducted shall be kept clean. Promptly remove materials spilled on pavement.
- B. Repair existing lawns damaged by operations under contract. Repair shall include finish grading, seeding, as required to match existing grade and lawn, and maintenance of repair areas.
 - 1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
 - 2. Install new planting soil as required.
- C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.
- D. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new

planting soil. Upon completion of lawn installation, remove from the site and legally dispose of the following:

1. Surplus subgrade material
 2. Stone and foreign matter.
- E. Mow, dethatch, core aerate, and rake existing turf.
- F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- H. Till stripped bare, and compacted areas thoroughly to a soil depth of 6 inches.
- I. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.
- J. Apply seed and hydroseed as required for new turf.
- K. Water newly planted areas and keep adequately watered through establishment period.

3.6 CLEANUP AND PROTECTION

- A. Perimeter silt fence and inlet protection shall remain in place adjacent to all temporary soil stabilization areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after turf areas are established.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 32 92 00