TECHNICAL SPECIFICATIONS
FOR
S Union St Overlay & Alley Crushing And Paving Project
VILLAGE OF EMPIRE

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Job #250276
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TECHNICAL SPECIFICATIONS

DIVISION 1 – CONTRACT DOCUMENTS

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

1. The work consists of HMA paving S. Union St. and crushing, shaping, and HMA paving of Alley.

1.02 CONTRACTS

All work will be awarded under one contract.

1.03 ALTERNATES

No alternative bids will be considered for this project.

1.04 WORK BY OTHERS

No work by others is anticipated that will affect work under this project.

1.05 FUTURE WORK

No future work is anticipated that will affect work under this project.

1.06 WORK SEQUENCE

1. A work sequence is to be submitted for review by the Engineer prior to construction starting. No interruption of the water system will be allowed without prior authorization by the Village.

1.07 COORDINATION

Coordinate all work with the OWNER to minimize any inconvenience.

1.08 AVAILABILITY OF LANDS

All work will take place on property owned or controlled by the OWNER or within the public right-of-way.

1.09 PRE-ORDERED ITEMS

No items have been pre-ordered for this project.

1.10 OWNER FURNISHED ITEMS

No items will be furnished by the owner for this project.

1.11 PROJECT IDENTIFICATION AND SIGNS

No project identification signs are required or will be allowed without approval of Owner.

1.12 AUDIO-VIDEO ROUTE SURVEY

No audio-video route survey is required.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. Refer to Article 14 of the General Conditions.

B. Bid price includes all labor, tools, equipment, materials, transportation, and applicable fees and sales tax necessary to complete the work in accordance with the Plans and Specifications.

C. All measurement and payment will be based on completed work, ready for use, performed in strict accordance with the Plans and Specifications.

D. Bid quantities listed in the Bid Schedule have been estimated and are only for the purpose of comparing, on a uniform basis, the Bids offered for the Work. Completed quantities for payment will be based on field measurements.

E. Neither the Owner nor his agents shall be held responsible should any of the estimated quantities be found incorrect.

F. Payment will be made only on items listed in the BID SCHEDULE. All other work not listed in the BID SCHEDULE shall be considered incidental to the performance of the Work.

G. Owner reserves the right to delete any line item or quantity on the BID SCHEDULE.

1.02 APPLICATION FOR PAYMENT

A. Pay period: 30 days.

B. Payment requests shall be submitted on the forms included in the Specifications.

1.03 SUBMITTALS

A. Submit Conditional Partial Waiver of Lien with each application for payment request, as specified in the General Conditions Article 15.

B. Submit a schedule of values in accordance with Section 01300 for all Lump Sum Bids items.

C. Prior to the first partial payment, submit a construction progress schedule in accordance with Section 2 of the General Conditions.

1.04 ITEMS OF THE BID FORM

A. Item No. 1 – Mobilization
   1. Payment includes obtaining bond, preparatory work and operation, for the movement of personnel, equipment, supplies, and incidentals to the project site; establishment of a project office and other facilities needed to undertake the Work.
   2. Unit of measure: Lump Sum.

B. Item No. 2 – Traffic Control
   1. Payment includes furnishing and operating all necessary traffic control devices, including signs, detours, barricades, and any other devices needed to regulate traffic in accordance with Section 01570.
   2. Unit of measure: Lump sum.

   3. Unit of measure: Square yards of proposed crushed and shaped surface as indicated on the plans.

C. Item No. 3 – Crush and Shape HMA Pavement & Base
   1. Payment includes saw cutting and/or pulverizing the existing HMA pavement, aggregate base, and additional supplied aggregate, and shaping, grading and compacting the crushed material in areas shown on the plans. It also includes placing and compacting crushed material along the shoulders following placement of HMA surface, disposal of excess material, and transporting material within the project limits.

   2. Unit of measure: Square yards of proposed crushed and shaped surface as indicated on the plans.

D. Item No. 4 – Aggregate Base
   1. Payment includes furnishing and placing additional 22A aggregate in locations designated by Engineer and as indicated on the plans. Additional material shall be placed prior to the pulverizing operation. compaction, fine grading, traffic control, and testing.

   2. Unit of measure: Tons in place substantiated by weight tickets.

E. Item No. 5 – HMA 4EL
   1. Payment includes furnishing, placing, and compacting HMA mixtures to the required thicknesses as shown on the plans.

   2. Unit of measure: Square Foot of concrete surface measured in place.

F. Item No. 6 – Remove and Replace Concrete Driveway
   3. Payment includes removal of existing, preparation of base, base material, placement of aggregate, compaction, reinforcement, placement of concrete, finishing, and testing.

   4. Unit of measure Square Foot of concrete surface measured in place.

G. Item No. 7 – Aggregate Shoulder
   5. Payment includes furnishing and placing 23A aggregate in locations designated by Engineer and as indicated on the plans. Additional material shall be placed prior to the pulverizing operation. compaction, fine grading, traffic control, and testing.
   6. Unit of measure: Tons in place substantiated by weight tickets.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 STAKEOUT AND SURVEYING

A. Owners responsibility: none.

B. Contractors responsibility:
   1. Obtain field measurements, line and grade control, and facility locations based on project plans.
   2. Preserve and protect all field staking.

1.02 SOIL BORINGS

A. Soil borings were NOT conducted at the site

B. Boring logs, if provided, indicate the conditions at the boring location only and do not necessarily reflect soil conditions elsewhere.

1.03 EXISTING UTILITIES

A. Existing utilities, if shown on the Plans, are in their approximate location, based on the available data.

B. The Owner will not be responsible for omissions or variations from the locations shown.

C. Contact Miss Dig (1-800-482-7171) 72 hours prior to any excavation to locate existing buried utilities.

D. Preserve and protect existing utilities from damage. Repair all damage to existing utilities at no cost to the Owner. Work stoppages resulting from damaged utilities will not entitle the Contractor to additional payment.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 PERMITS AND FEES

A. Owners responsibility: The owner will obtain the following permits where applicable.
   1. MDEQ permit in accordance with Part 41 of Act 451, P.A. 1994 for construction of sanitary sewer facilities.
   2. MDEQ permit in accordance with Part of Act 399, P.A. 1976.
   3. MDOT permit for work within state right-of-way.
   4. Soil Erosion and Sedimentation Control Act, Part 91 of Act 451, P.A. 1994.
   5. County Road Commission permit for work within county right-of-way.
   6. MDEQ Wetland permit in accordance with Part 303 of Act 451, P.A. 1994.
   7. MDEQ Inland Lakes and Streams permit in accordance with Part 301 of Act 451, P.A. 1994.

B. Contractors responsibility:
   1. Meet provisions and requirements of all permits obtained by the Owner.
   2. All local or state permits and fees required that are not listed in Section 01060 1.01.A.
   3. If applicable, contractor shall get bonding for construction within state highway right-of-way.

C. All permits obtained to date are attached at the end of the specifications.

1.02 APPLICABLE CODES

A. All references to codes, specifications, and standards shall refer to the latest edition, amendment, or revision of the reference in effect on the BID due date.

B. Abbreviations used for codes and references are listed in Section 01090 ABBREVIATIONS AND SYMBOLS.

PART 2 PRODUCT - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01090

ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 DEFINITIONS

A. Reference to codes, standards, institutions, associations, or government authorities is made in accordance with the following abbreviations:

AASHTO	- American Association of State Highway Officials
ACI	- American Concrete Institute
AISC	- American Institute of Steel Construction
AISI	- American Iron and Steel Institute
ANSI	- American National Standard Institute
ASTM	- American Society of Testing Materials
AWS	- American Welding Society
AWWA	- American Water Works Association
BOCA	- Building Officials Code Association
FAA	- Federal Aviation Association
MDEQ	- Michigan Department of Environmental Quality
MDOT	- Michigan Department of Transportation
MDNR	- Michigan Department of Natural Resources
MI-OSHA	- Michigan Department of Occupational Safety and Health Association
NEC	- National Electric Code
NEMA	- National Electrical Manufacturers Association
NFPA	- National Fire Protection Association
RECD	- Rural Economic Community Development
USEPA	- United States Environmental Protection Agency
UL	- Underwriter’s Laboratories

PART 2 PRODUCT - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 PRECONSTRUCTION MEETING

A. Prior to delivery of materials or the start of any construction a preconstruction meeting will be held.

B. The Engineer will establish the meeting place, time and date, distribute agenda, notify participants, and administer the meeting. Contractor shall notify major subcontractors.

C. Attendance:
1. OWNER
2. ENGINEER
3. CONTRACTOR
4. Major Subcontractors
5. Utility Companies
6. Safety Representatives
7. Governmental Agencies

D. Agenda:
1. Distribution by Contractor and discussion of:
    a. List of names and telephone numbers for superintendent, foreman and other key personnel.
    b. List of major subcontractors and suppliers.
    c. Projected Construction Schedules.
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project coordination
5. Responsibilities of Owner, Engineer, Contractor and other agencies.
6. Utility Discussions
    a. Critical Utilities
7. Permit Issues
8. Procedures and processing of:
    a. Field decisions.
    b. Proposal requests.
    c. Submittals.
    d. Change orders.
    e. Application for payment.
9. Adequacy of distribution of Contract Documents.
10. Procedures for maintaining Record Documents.
11. Use of premises.
12. Construction facilities, controls and construction aids.
13. Temporary utilities.
14. Safety and first aid procedures.
15. Security procedures.
16. Housekeeping procedures.
17. Testing and Staking
18. Record Documents
19. Sign Contracts

E. The Engineer will prepare minutes and distribute copies to participants within seven (7) days of meeting. Participants shall report corrections and comments within ten (10) days of receipt of minutes.

1.02 PROGRESS MEETINGS

A. Periodic Progress Meetings will be held as required by the progress of the work.

B. The Engineer will establish the meeting place, time and date, distribute agenda, notify participants and administer the meeting. Contractor shall notify major subcontractors.

C. Attendance:
1. OWNER
2. ENGINEER
3. CONTRACTOR
4. Subcontractor as appropriate to the agenda.
5. Suppliers as appropriate to the agenda.
6. Others

D. Agenda:
1. Review minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Review field observations, problems, and conflicts.
4. Review problems that impede Construction Schedules.
5. Review of shop drawings, off-site fabrication, and delivery schedules.
6. Review corrective measures and procedures to regain projected schedule.
7. Review revisions to Construction Schedules.
8. Review plan progress, schedule, during succeeding work period.
9. Review coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Review maintenance of quality standards.
12. Review proposed changes for:
    a. Effect on Construction Schedule and on completion date.
    b. Effect on other Contracts of the Project.
13. Other business.

E. The Engineer will prepare minutes and distribute copies to participants and Owner within seven (7) days of meeting for review at the next meeting.

PART 2 PRODUCT - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 CONSTRUCTION SCHEDULE

A. Preparation:
1. Prepare in the form of a horizontal bar chart, CPM network, or other form previously approved by the Engineer.
2. Provide a separate horizontal bar column or path for each trade or operation.
3. Prepare the schedule in the chronological order of the beginning of each item of work.
4. Allow space for updating.
5. The schedule sheets shall be 11" x 17" unless otherwise approved by the Engineer.

B. Content of schedule:
1. Provide a complete sequence of construction by activity.
2. For Shop Drawings, project data, and samples show the following:
   a. Submittal dates.
   b. Dates review copies will be required.
3. Show product procurement and delivery dates.
4. Show dates for beginning and completion of each element of construction.
5. Show projected percentage of completion for each item of work as of the first day of each month.

C. Updating Schedule:
1. Show all changes occurring since previous submission of the updated schedule.
2. Indicate progress of each activity and show completion dates.
3. Other items required in schedule updates are:
   a. Major changes in scope.
   b. Activities modified since previous updating.
   c. Revised projections due to changes
   d. Other identifiable changes.

D. Submittals:
1. Submit initial schedule within 15 days after receipt of a Notice to Proceed.
2. Submit updated schedules accurately depicting progress to the first day of each month.
3. Progress schedules shall be included with the Contractor's monthly application for payment

1.02 APPLICATION FOR PAYMENT

A. Preparation:
1. Applications for payment to be submitted in accordance with Article 15 of the General Conditions.
2. Application for payment shall be made on forms provided by or approved by the Engineer.

B. Schedule of Values:
1. Contractor shall submit a schedule of values for all lump sum items in the Bid Schedule.
2. A preliminary schedule of values shall be submitted to the Engineer for review and approval prior to the preconstruction meeting.
3. Schedule of values will be used only as the basis for the Contractor's application for payment.

C. Submittals
   1. Contractor shall submit three signed copies to the Engineer for review.
   2. Application for payment shall be submitted to the Engineer as agreed to at the preconstruction meeting.

1.03 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. General:
   1. Provide shop drawings in accordance with Article 6 of the General Conditions.
   2. Shop Drawings are to be scaled drawings large enough to show all pertinent features of the item and its method of connection to the Work.
   3. Literature from manufacturers that includes data not pertinent to this submittal, shall be clearly marked to indicate which portion of the contents is being submitted for the Engineer's review.
   4. Samples shall illustrate materials, equipment, or workmanship and establish standards by which completed work is judged.
   5. Unless otherwise specifically directed by the Engineer, all samples shall be of the precise article proposed to be furnished.

B. Submittals:
   1. Submit the number of copies that the Contractor requires to be returned, plus three copies that will be retained by the Engineer.
   2. All submittals are to be accompanied with a transmittal form that will be provided by or approved by the Engineer.
   3. Contractor to thoroughly check Shop Drawings for compliance with the Contract Documents and verify field dimensions and construction criteria:
      a. Indicate approval by stamping "Approved", with Contractor's signature and date on all copies submitted.
      b. Shop Drawings submitted without stamped approval of the Contractor will be returned without review.
   4. Clearly indicate all deviations in the Shop Drawings from the requirements in the Contract Documents.
   5. Make submittals in groups containing all associated items.
   6. Provide submittals in advance of scheduled dates of installation to allow time for Engineer review, possible revision, and re-submittal; and for placing orders and securing delivery.
   7. Allow 15 working days for Engineer review after receipt of submittal.
   8. Cost of delays caused by late submittals shall be the responsibility of the Contractor.

C. Review of submittals:
   1. Submittals will be returned marked with Engineer’s review comments.
   2. Rejected submittals shall be revised by the Contractor and resubmitted.
   3. Engineer's checking of Shop Drawings does not relieve the Contractor of responsibility for errors or omissions.

1.04 OPERATION AND MAINTENANCE MANUALS

A. General:
   1. Manuals shall be in durable plastic binders approximately 8½ " x 11" in size with at least the following:
      a. Identification on or readable through, the front cover stating general nature of the manual;
      b. Neatly typewritten index near the front of the manual;
      c. Complete instructions regarding operation and maintenance of all equipment involved;

d. Complete nomenclature of all replaceable parts, their part numbers, and name and address of nearest vendor of parts;
e. Copies of all guarantees and warranties issued;
f. Copy of the approved Shop Drawing and all data concerning all changes made during construction.

2. Manuals that include manufacturer's catalog pages shall, clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all manufacturers' data with which this installation is not concerned.

B. Submittals:
1. Provide 3 copies of the manual to the Engineer unless indicated otherwise in pertinent Sections.
2. Submit operation and maintenance manuals prior to initial equipment startup.

1.05 AUDIO-VIDEO ROUTE SURVEY

A. General:
1. When required in Section 01010 SUMMARY OF WORK, the Contractor shall furnish the engineer with an Audio-Video Route Survey record of the existing conditions.
2. Audio-Video Route Surveys shall:
a. Be recorded on a ½ inch VHS formatted cassette or DVD.
b. By electronic means, display continuously the date (month, day and year) and time (hours, minutes and seconds).
c. Be made on continuously running audio-video tapes.
d. Be recorded at a rate of speed, equal to a slow walk (2 mph), in the general direction of travel. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that stop action during play-back will produce clarity of detail of the object viewed.
e. Be done during times of good visibility. No taping shall be done during periods of visible precipitation, standing water or snow cover unless approved by the Engineer.

B. Content:
1. Complete coverage including all surface features located within the public right-of-way, easement areas and adjacent private properties up to building line when such properties lie within the zone of influence of construction.
2. Coverage shall include but not limited to:
a. Driveways
b. Sidewalks
c. Curbs
d. Ditches
e. Roadway
f. Landscaping
g. Trees
h. Culvert, headwalls and retaining walls
i. Buildings located within the zone of influence
3. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures can be located by reference.
4. All locations shall be identified by audio or visual means at intervals not to exceed 100 linear feet in the general direction of travel.

C. Submittals:
a. One copy of the audio-video tape/DVD shall be submitted to Engineer for review before the preconstruction meeting.
b. The Engineer shall review the tape within five full working days of receipt.

c. Any taped coverage not acceptable to the Owner shall be redone at no additional charge.
d. Contractor shall not place materials or equipment on the construction site prior to review and approval of the audio-video tape.

PART 2 PRODUCT - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes, testing required by the Owner to determine that materials and methods provided for the Work meet the specified requirements. Testing includes, but is not limited to:
   1. Bituminous pavement.
   2. Concrete.
   3. Soil gradation.
   4. Welding.
   5. Water quality testing.
   6. Density testing.

1.02 UNIT PRICES

A. The Contractor will be responsible for providing and paying for all testing procedures as described in Article 14 of General Conditions unless specified in this section.

B. The Contractor will be responsible for selecting proper testing laboratories subject to Engineer's approval.

C. Inspections and testing performed exclusively for the Contractor's convenience will be paid for by the Contractor.

D. The Owner will select the testing laboratories and pay for the following tests/inspections:
   1. Density testing
   2. Density and extraction testing of asphalt
   3. Grading of subbase and aggregate base
   4. Concrete testing

1.03 QUALITY ASSURANCE

A. Testing shall be in accordance with all pertinent codes, regulations, procedures, and requirements of the ASTM and other appropriate agencies.

PART 2 PRODUCTS -Not Used

PART 3 EXECUTION

3.01 PROCEDURE

A. Provide representatives of the testing laboratory with access to the Work at all times.

B. Coordinate the Work with the testing required. Provide a minimum of 24 hours notice to the testing laboratory prior to the need of testing.

C. Furnish all material required for sampling. The testing laboratory will obtain all specimens and samples required for testing. The testing laboratory will be responsible for transporting samples to the laboratory.

D. The testing laboratory will furnish two copies of lab report to the Engineer and one copy to the Contractor.

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes providing temporary utilities.

B. Maintain all temporary facilities in proper and safe condition.

C. Provide and pay all costs for all water, sanitary, electricity, heat, and telephone utilities necessary for the performance of the work.

D. Remove all temporary utilities at the close of the project.

PART 2 PRODUCTS

2.01 GENERAL

A. Materials must be adequate in capacity, must be safe, and must not violate requirements of applicable codes and standards.

2.02 SANITARY FACILITIES

A. Furnish, install, and maintain temporary sanitary facilities for employees' use.

B. Comply with State and local health department rules and regulations, and all requirements of the Michigan Department of Labor Construction Safety Commission Standards.

2.03 WATER, ELECTRICITY, AND TELEPHONE

A. The contractor will make their own arrangements for temporary service of these utilities.

B. The contractor will be responsible for all costs associated with these utilities.

2.04 TEMPORARY HEATING

A. Provide temporary heat and ventilation necessary to maintain environmental conditions to facilitate work progress and meet the minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.

B. The contractor will be responsible for all costs associated with temporary heating and ventilation.

PART 3 EXECUTION

3.01 GENERAL

A. Maintain and operate systems to assure continuous service. Modify and extend systems as work progress requires.

B. Completely remove temporary materials when they are no longer being used.

END OF SECTION

SECTION 01536

SAFETY PRECAUTIONS AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Provide and maintain adequate facilities for the protection and safety of all persons and property in accordance with Article 6 of General Conditions.

1.02 UNIT PRICES

A. All work under this Section shall be considered as incidental to construction.

1.03 REFERENCED STANDARDS

A. Unless otherwise specified, the work for this Section shall conform to all State and National laws, ordinances, rules and regulations pertaining to the kind, including but not limited to the following Standard Specifications:
   1. State of Michigan "Occupational Safety and Health Act", Act 154 of the Public Acts of 1974 (MIOSHA) as administered by the Michigan Department of Labor and Public Health.
   2. MDOT Michigan Manual of Uniform Traffic Control Devices (MMUTCD)

PART 2 PRODUCTS

2.01 SIGNS AND BARRICADES

A. Provide in accordance with MDOT Michigan Manual of Uniform Traffic Control Devices - Part 6.

2.02 TEMPORARY FENCING

A. All fencing be strong and durable enough to discourage unauthorized entrance, constructed with the following materials:
   1. Posts: Wood or steel
   2. Fabric: Snow fence type, wood or plastic, 4 feet high.

PART 3 EXECUTION

3.01 GENERAL

A. Provide adequate warning signs, barricades, lights, and flagmen as necessary for the protection of the work and safety of the workmen and general public. Control devices shall:
   1. Protect workmen and the public from all open trenches and excavations.
   2. Provide temporary fencing to discourage unauthorized entrance.

B. All barricades, signs, lights, and other protective devices shall be installed and maintained in conformance with the transportation authority having jurisdiction.

C. Designate all streets or roads that are closed with barricades and warning signs. Closing of roads shall be approved by the authority having jurisdiction. Properly notify the local emergency services prior to closing of any road.

D. Maintain temporary fencing throughout the duration of construction.

E. Remove temporary fencing at project completion or after permanent fencing is installed.

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Provide and maintain traffic control equipment and personnel to protect the work and workmen, and to ensure the least possible obstruction to traffic and inconvenience to the general public.
   2. Meet all the requirements of the construction permit issued by the right-of-way owner.

B. Related Sections:
   Section 01025 MEASUREMENT AND PAYMENT

1.02 UNIT PRICES

All work under this Section shall be considered as incidental to construction, unless specifically indicated on the BID SCHEDULE and referred to in Section 01025 MEASUREMENT AND PAYMENT.

1.03 REFERENCED STANDARDS

MDOT Michigan Manual of Uniform Traffic Control Devices (MMUTCD)

PART 2 PRODUCTS

2.01 GENERAL

All products shall be in accordance with the Michigan Manual of Uniform Traffic Control Devices.

PART 3 EXECUTION

3.01 DETOURS

A. Contractor shall be solely responsible for acts or omissions resulting in any legal proceedings due to improper or inadequate detour or safety controls.

B. Submit proposed detour route to the Engineer, the municipality, and all emergency services for approval prior to construction in the detour area.

C. Keep fire hydrants adjacent to the work accessible to fire fighting equipment at all times.

D. Keep police, fire, and other emergency services informed of the status of road closings.

3.02 PUBLIC ACCESS

A. Maintain traffic access in accordance with local laws and regulations having jurisdiction.

B. Minimize the time that vehicular and pedestrian access to any occupied home, or other building is interrupted. Maintain continuous access to businesses.

C. Maintain temporary driveways, roadways, and crosswalks in good, usable condition until they are fully restored. As a minimum, provide 6 inches of compacted 22-A aggregate at all driveways.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, tools, facilities, and materials necessary to properly transport, handle, store and protect all materials and equipment necessary for the performance of the work.

B. All materials shall be new.

C. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and that products are properly protected and undamaged.

1.02 TRANSPORTATION AND HANDLING

A. Properly protect all materials and equipment to prevent damage during transportation and handling.

B. Detailed special handling requirements are specified under the appropriate specification section for the products handled.

1.03 STORAGE AND PROTECTION

A. Store all materials and equipment to insure the preservation of their quality and fitness for the work.

B. Store packaged materials in their original containers until ready for use.

C. Protect all materials and equipment before, during, and after installation.

D. Provide suitable weather tight storage sheds with raised floors to store and protect materials and equipment that could be damaged by exposure to weather.

E. Repair or replace all damaged materials and equipment, subject to Engineer approval.

F. No damaged material shall be used in the work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01630

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes substitution of materials, articles, and equipment.

B. Recommend substitutions in accordance with this section and Section 6.05 of the General Conditions.

C. Products of equal capacities, quality and function shall be considered.

PART 2 PRODUCTS

2.01 GENERAL

A. Submit five copies of a complete list of all products proposed for installation within 30 days after date of Contract, unless otherwise indicated in the Contract Documents.

B. Tabulate the list by each Specification Section.

C. Include the following for referenced products:
   1. Name and address of manufacturer.
   2. Trade name.
   3. Model or catalog designation.
   4. Manufacturer’s data including performance and test data, and reference standards.

PART 3 EXECUTION

3.01 CONTRACTOR’S OPTIONS

A. For products specified by reference, select any product meeting the standards.

B. Submit a request for substitution for products specified by name.

3.02 GENERAL

A. Written requests from Bidders will only be considered if received at least ten working days prior to Bid date.

B. The Engineer will consider formal requests from the Contractor for substitution of specified products within thirty days of Contract unless specified elsewhere in the Contract Documents.

C. Submit three copies of all substitution requests, plus the number the Contractor would like returned.

D. Substitutions will not be considered if:
   1. Indicated or implied on Shop Drawings or project data submittals without formal request submitted in accordance with this Section and Section 7.05 of the General Conditions.
   2. Acceptance will require substantial revision of the Contract Documents.

3.03 SUBMITTALS

A. Complete data substantiating compliance with the Contract Documents.

B. For products:
   1. Product identification, including manufacturer’s name and address.
   2. Manufacturer’s literature, including product description, performance and test data, and reference standards.
   3. Samples.
   4. Name and address of similar projects on which the product was used and date of installation.
   5. Detailed drawings for modifications to other aspects of the project required for the substitution in accordance with Section 7.05.A.2 of the General Conditions.

C. For construction methods:
   1. Detailed description of the proposed method.
   2. Drawings illustrating methods.

3.04 CONTRACTOR'S RESPONSIBILITIES

A. Investigate the proposed product or method and determine that it is equal or superior in all respects to that which is specified.

B. Provide the same guarantee for the substitution as for the product or method specified.

C. Coordinate installation of the accepted substitution into the work, making changes as required for the work to be completed in all respects.

D. Waive all claims for additional costs related to the substitution.

E. Include itemized cost estimate in accordance with Section 7.05.A.2 of the General Conditions.

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes contract close-out requirements.

B. Contract close-out shall be done in accordance with the Contract Documents before final payment will be released.

1.02 CLEANING

A. Clean the site in accordance with Section 5.02.C of the General Conditions.

1.03 PROJECT RECORD DOCUMENTS

A. Provide one set of record documents in accordance with Section 7.11 of General Conditions.

B. Provide materials certifications as specified by the Engineer.

C. Submittal of the Record Documents shall be made with a transmittal letter containing:
   1. Date
   2. Project title and number
   3. Contractor’s name and address
   4. Title and number of each Record Document

1.04 GUARANTEES

A. Provide in accordance with Section 7.17 of the General Conditions.

B. Manufacturer's Guarantee:
   1. For each item of equipment, furnish the guarantee of the manufacturer.
   2. Guarantee that the equipment will perform its intended service and that any defective design or workmanship shall be corrected or replaced at no expense to the OWNER.
   3. The guarantee period of the manufacturer's guarantee shall be one year from the date of final payment of the project by the Owner, unless specified otherwise.

1.05 SUBSTANTIAL COMPLETION

A. Certification that the work is substantially complete shall be in accordance with Section 15.03 of the General Conditions.

1.06 FINAL INSPECTION AND PAYMENT

A. The final inspection, final application for payment and acceptance shall be in accordance with Section 15.05 and 15.06 of the General Conditions.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section includes; all labor, materials, tools, and equipment necessary for the complete installation of aggregate surfaces, including roadways, driveways, and parking areas. Also includes providing, shaping and grading the sand base.

B. Related Sections

01025	MEASUREMENT AND PAYMENT
01410	TESTING LABORATORY SERVICES

1.02 QUALITY ASSURANCES

A. Materials:
1. Test in accordance with Section 01410, TESTING LABORATORY SERVICES.
2. All materials used as fill or sub-base shall be approved by the Engineer.
3. Determine gradation in accordance with ASTM C-136.
4. Determine percent loss by washing in accordance with ASTM C-117.

B. Compaction:
1. Determine maximum density using the Modified Proctor Method, ASTM D-1557.
2. Engineer may approve other field determinations of maximum density, such as Michigan Cone.
3. Field determination of in place density shall be by Nuclear Density Method, ASTM D-2922, or other approved method.

C. Except as modified by this Section, perform earthwork in accordance with Division 2, MDOT Standard Specifications.

1.03 SITE CONDITIONS

A. No soil investigation was performed at the site.

1.04 UNIT PRICES

Refer to Section 01025 MEASUREMENT AND PAYMENT.

1.05 REFERENCED STANDARDS

Unless otherwise specified, the work for this Section shall conform to the applicable portions of the following Standard Specifications:

ASTM - American Society for Testing and Materials
MDOT - Michigan Department of Transportation
OSHA - Occupational Health and Safety Association

PART 2 PRODUCTS

2.01 MATERIALS

A. General:
1. All fill material shall be approved by the Engineer prior to placement.
2. Fill material shall be free from clay, organic matter, roots, debris, and frozen soil.
3. Obtain fill material from on-site excavations, or from an approved borrow area.
4. Provide Testing Laboratory with access to material source.

B. Class II and III backfill:
Granular material meeting requirements of Section 8.02.06 of the MDOT Standard Specifications for construction.

C. Pipe Bedding:
Granular material meeting requirements of ASTM D2321

D. Topsoil:
Dark brown or black loam, clay loam, or sandy loam, of a fertile, humus soil origin.

PART 3 EXECUTION

3.01 DUST CONTROL

A. Control dust at the Work area at all times to prevent dust from becoming a nuisance to the public, neighbors, or the work of others on the site.

B. Provide moisture or otherwise treat surfaces to control dust.

3.02 TOPSOIL

A. Removal:
1. Remove all topsoil from areas to be occupied by structures, improved surfaces, or where new grades are to be established.
2. Stockpile topsoil for future use in finish grading at a site approved by the Engineer.

B. Application:
1. Provide topsoil over all disturbed areas not occupied by structures or improved surfaces.
2. Spread the stockpiled topsoil over the prepared rough grade to a minimum depth of 4 inches.
3. Provide additional topsoil as required to complete the Work.
4. Finish grade, and rake the topsoil to remove all stones, sticks, roots, and debris in preparation for seeding.
5. Excess topsoil may be used for fill in non critical areas.

3.03 EXCAVATING-GENERAL

A. Excavate to the lines and grades shown on the plans.

B. Provide safe excavation slopes in accordance with OSHA Regulation 54 FR 45894.

C. Protect excavation bottoms from frost.

D. Dispose of excess excavated material off site or on site at a location approved by the Engineer.

E. Provide dewatering in accordance with Section 02140 as required.

F. Enlarge excavations laterally to provide adequate room for construction or provide shoring and bracing in accordance with Section 02150, as necessary.

3.04 EXCAVATING, BACKFILLING, AND COMPACTING FOR STRUCTURES

A. Over-excavation:
1. In the event clay or stone is encountered at the bottom of the excavation, undercut bottom

a minimum of 12 inches.
2. If muck or other deleterious material is encountered, remove this material to a depth where suitable subgrade soil is encountered, unless otherwise instructed by the Engineer.
3. Backfill to proposed subgrade elevation with Class II material.
4. Compact backfill in lifts not exceeding 9 inches to 95% Modified Proctor density.

B. Backfilling:
1. Remove all debris from excavation prior to backfilling.
2. Compact excavation bottom to 95 % Modified Proctor density to a depth of 2 feet prior to placing backfill.
3. Backfill material shall be Class II sand.
4. Do not backfill against cast in place structures until approved by the Engineer.
5. Do not backfill on only one side of a vertical wall unless the walls are adequately shored or the permanent structure is in place.
6. Compact backfill in lifts not exceeding 9 inches to 95% Modified Proctor density.

3.05 EXCAVATING, BACKFILLING, AND COMPACTING FOR ROAD SUBGRADE, PAVED SURFACES AND APPURTENANCES

A. Subgrade undercutting:
1. Remove all peat, muck, topsoil and other organic matter from the roadway subgrade.
2. Remove all soils other than granular materials within 15 inches of the proposed subgrade elevation.
3. Place Class II sand and compact to 95% Modified Proctor density to proposed subgrade elevation.
4. Extend undercutting of unsuitable materials to the limit of a 1 on 1 slope spreading outward from the grade and location of the outside edge of the finished pavement, curb, or other improved surface.

B. Backfilling around curbs, sidewalks, and appurtenances:
1. Remove all debris from excavation prior to backfilling.
2. Compact excavation bottom to 95 % Modified Proctor density to a depth of 2 feet prior to placing backfill.
3. Backfill material shall be Class II sand.
4. Do not backfill against cast in place structures until approved by the Engineer.
5. Compact backfill in lifts not exceeding 9 inches to 95% Modified Proctor density.

3.06 EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

A. Trench excavation:
1. Conduct excavation in a safe and orderly manner at all times, in compliance with all applicable safety regulations.
2. Use hand tools where mechanical equipment will cause damage to adjacent trees, structures, or utilities.
3. Excavate trench to the cross-section shown on the trench detail.
4. Do not excavate the trench ahead of the pipe laying operation more than the Contractor can reasonably expect to backfill by the end of the work day.

5. Support and protect all existing utilities encountered within the trench.
6. Place excavated material where it will not obstruct sidewalks, driveways, roadways, or the work of others.
7. Undercutting
a. In the event clay or stone is encountered at the bottom of the excavation, undercut the bottom a minimum of 6 inches.
b. Undercut the trench a minimum of 6 inches for plastic water main or sanitary sewers in all soils.
c. If muck or other deleterious material is encountered, remove this material suitable soil,

unless modified by the Engineer.

d. Backfill to proposed pipe grade with material meeting ASTM D2321 compacted to 95% Modified Proctor density.

B. Pipe bedding:
1. Grade trench bottom to provide uniform, firm, and stable surface, free from rocks and other unsuitable materials.
2. Provide a tamped sand bedding for the full length of the pipe barrel, with recesses excavated for the joints.
3. Bedding material shall meet requirements of ASTM D2321.
4. Place bedding simultaneously on each side of the pipe for the full width of the trench, to a depth of 1 foot above the pipe.
5. Place bedding in 9 inch layers and compact to 95% Modified Proctor Density, being careful not to displace the pipe laterally.

C. Trench backfill, critical areas:
1. Class II material in areas under or within 10 feet of structures or improved surfaces.
2. Place in layers not exceeding 9 inches and compact each layer, by mechanical means, to 95% Modified Proctor density.
3. If trench settles greater than 1 inch within the one year following Owner's acceptance of project, the Contractor shall bring the trench back to grade and restore the surface at no additional cost to the Owner.

D. Trench backfill, non-critical areas:
1. Class III material approved by the Engineer, free from frozen soil, vegetation, and debris.
2. Place in layers not exceeding 12 inches and compact each layer by mechanical means to a minimum of 90% Modified Proctor density.

E. Pipe protection:
1. Mound and compact additional granular backfill over pipe, if required, to provide a minimum cover depth of 3 feet to protect pipe while construction equipment is operating on site.
2. Remove additional backfill when grading to achieve finished grade.

3.07 CONTROLLED FILLS AND EMBANKMENTS

A. General:
1. All filling under or within a 1:1 slope from the outer edge of buildings, structures, or improved surfaces shall be controlled fill.
2. Material: Class II granular material, unless otherwise specified by the Engineer.

B. Placing fill:
1. Remove topsoil roots and stumps to a depth of 12 inches prior to prior to placing fill.
2. Compact existing ground to 95% Modified Proctor density prior to placing fill.
3. Spread fill in uniform layers not exceeding 9 inches and compact to 95% Modified Proctor density.

C. Compaction:
1. Compacting equipment shall be heavy duty, rolling drum, vibrating type.
2. Use pneumatic tire rollers in predominantly granular soils.
3. Use sheepsfoot type roller in predominantly clay soils.
4. Use hand operated vibrating sled for compaction around structures.
5. Other methods of producing equivalent results will be allowed when approved by the Engineer.
6. Density in areas under or adjacent to structures or improved surfaces shall be to 95%

Modified Proctor density.

7. Density in other locations shall be to 90% Modified Proctor density.

D. Moisture:
If material is too wet or dry for satisfactory compaction, adjust moisture content as required.

3.08 GRADING

A. Conform to lines, contours, and spot elevations shown on the plans.

B. Perform finish grading on ground surfaces to an accuracy of plus or minus 0.1 feet.

C. Perform finish grading on improved surfaces to an accuracy of plus or minus 0.05 feet.

END OF SECTION

SECTION 02270

EROSION CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section includes, work necessary for effective temporary and permanent soil erosion and sedimentation control.

B. Related Sections:
1. Section 01025 MEASUREMENT AND PAYMENT
2. Section 02200 EARTHWORK
3. Section 02900 LANDSCAPING

1.02 UNIT PRICES

Temporary and permanent erosion control measures will be considered incidental to the construction, unless specifically indicated on the BID SCHEDULE and referred to in Section 01025 MEASUREMENT AND PAYMENT.

1.03 QUALITY ASSURANCES

Perform all Work in accordance with the Michigan Soil Erosion and Sedimentation Control Act, Part 91 of Act 451, P.A. 1994, and with the requirements of the local agencies having jurisdiction over the Work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Seed, fertilizer, and mulch: Provide as specified in Section 02900 LANDSCAPING.

B. Provide temporary and permanent structures and materials in accordance with the Michigan Department of management and Budget Keying System. See Figure 1 at the end of this section.

C. Mulch blanket:
1. Materials: 100% straw sewn into a lightweight, photo degradable netting.
2. Model: S75.
3. Straw content: 0.5 pounds per square yard.
4. Manufacturer: North American Green.

D. Geotextile filter fabric:
1. Materials: Mechanically bonded, non-woven geotextile.
2. Manufacturer: Amoco
3. Model: CEF 4553
4. Tensile strength: 203 lbs. (ASTM D-4632).
5. Tensile elongation: 50% min. (ASTM D-4632).
6. Tear strength: 80 lbs. (ASTM D-4533).

7. Puncture strength: 130 lbs. (ASTM D-4833).
8. Apparent opening size: 100 sieve (ASTM D-4751).

E. Rip rap stone: (4-6")
1. Material: native fieldstone from local gravel pits, exhibiting sound structure and strength for the intended use.
2. Size: 1" to 6" stone.
3. Gradation:
a. D_{100} = 6 inch
b. D_{50} = 4 inch
c. D_{10} = 2 inch

F. Rip rap stone: (10-12")
1. Material: native fieldstone from local gravel pits, exhibiting sound structure and strength for the intended use.
2. Size: 6" to 12" stone.
3. Gradation:
a. D_{100} = 12 inch
b. D_{50} = 10 inch
c. D_{10} = 8 inch

G. Silt fence:
1. Conforming to Michigan Department of Transportation Standard Specifications.

PART 3 EXECUTION

3.01 GENERAL

Conduct site evaluation with the Engineer and the soil erosion control officer prior to starting work.

3.02 TEMPORARY EROSION CONTROL

A. Minimize the area of earth disturbed at any one time.

B. Provide berms or ditches to divert storm runoff from the construction area when steep slopes or highly erodible soils are present.

C. Contain all sedimentation on site by using straw bales, filter fence, or sedimentation basins.

3.03 PERMANENT EROSION CONTROL

A. When final grades have been established, provide topsoil, seed, fertilizer, and mulch.

B. Water all seeded areas as necessary to establish proper vegetative cover.

C. Should erosion occur within the guarantee period, regrade and reseed the disturbed area at no additional cost to the Owner.

3.04 MULCH BLANKET

A. Provide mulch blanket on all slopes 3:1 or steeper, that are disturbed during construction or as indicated on the plans.

B. Prepare soil prior to placing mulch blanket with topsoil, seed and fertilizer.

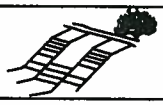
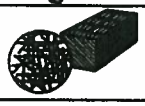
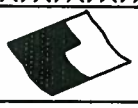
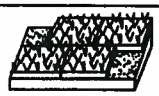
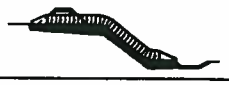
C. Place mulch blanket from top of slope down so overlap seams run parallel to slope.

D. Overlap seams a minimum of 2" on parallel seams, and six inches, shingle style, on perpendicular splices.

END OF SECTION

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

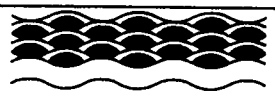
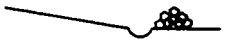
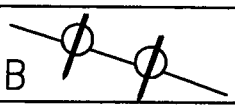
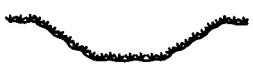
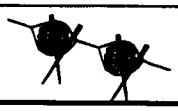
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
EROSION CONTROLS			
E1	SELECTIVE GRADING AND SHAPING		To reduce steep slopes and erosive velocities.
E2	GRUBBING OMITTED		For use on steep slopes to prevent rilling, gullying, and reduce sheet flow velocity or where clear vision corridors are necessary.
E3	SLOPE ROUGHENING AND SCARIFICATION		Where created grades cause increased erosive velocites. Promotes infiltration and reduces runoff velocity.
E4	TERRACES		On relatively long slopes up to 8% grades with fairly stable soils.
E5	DUST CONTROL		For use on construction sites, unpaved roads, etc. to reduce dust and sedimentation from wind and construction activities.
E6	MULCH		For use in areas subject to erosive surface flows or severe wind or on newly seeded areas.
E7	TEMPORARY SEEDING		Stabilization method utilized on construction sites where earth change has been initiated but not completed within a 2 week period.
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKETS		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E10	SODDING		On areas and slopes where immediate stabilization is required.
E11	VEGETATED CHANNELS		For use in created stormwater channels. Vegetation is used to slow water velocity and reduce erosion within the channel.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
E13	GABION WALLS		On newly created or denuded stream banks to reduce velocity until permanent stabilization is achieved or on existing banks to retard erosive velocities.
E14	ENERGY DISSIPATOR		Where the energy transmitted from a concentrated flow of surface runoff is sufficient to erode receiving area or watercourse.
E15	TEMPORARY SLOPE DRAIN		Where surface runoff temporarily accumulates or sheet flows over the top of a slope and must be conveyed down a slope in order to prevent erosion.
E16	SLOPE DRAIN		Where concentrated flow of surface runoff must be permanently conveyed down a slope in order to prevent erosion.

B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

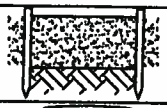
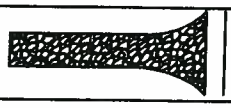
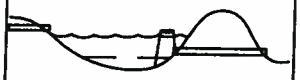
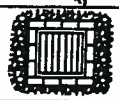
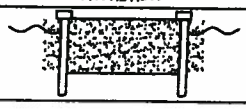
S-E-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E17	CELLULAR CONFINEMENT SYSTEMS		Used an steep slopes and high velocity channels.
E18	PLASTIC SHEETS		Used on exposed slopes, seeded areas, new ditch bottoms, and areas subject to surface runoff and erosion. Used as a liner in temporary channels and to stabilize stockpiles.
E19	TEMPORARY DRAINAGEWAY/ STREAM CROSSING		Use on construction sites where stream/drainageway crossings are required.
E20	TEMPORARY BYPASS CHANNEL		Use within existing stream corridars when existing flow cannot be interrupted, and at culvert and bridge repair sites
E21	LIVE STAKING	 B	In areas requiring protection of slopes against surface erasion and shallow mass wasting.
	EROSION / SEDIMENT CONTROLS		
ES31	CHECK DAM		Used to reduce surface flow velocities within constructed and existing flow corridors.
ES32	STONE FILTER BERM		Use primarily in areas where sheet or rill flow accurs and to accommodate dewatering flow.
ES33	FILTER ROLLS	 B	In areas requiring immediate protection of slopes against surface erosion and gully formation and for perimeter sediment control.
ES34	SAND FENCE		For use in areas susceptible to wind erosion, especially where the ground has not yet been stabilized by other means.
ES35	DEWATERING		Use where construction activities are limited by the presence of water and dry work is required.
ES36	DIVERSION DIKE/BERM		Within existing flow corridors to address or prevent erosion and sedimentation, or on disturbed or unstable slopes subject to erosive surface water velocities.
ES37	DIVERSION DITCH		In conjunction with a diversion dike, or where diversion of upslope runoff is necessary to prevent damage to unstabilized or disturbed construction areas.
ES38	COFFERDAM/SHEET PILINGS		Constructed along or within water corridor or waterbody to provide dry construction area.
ES39	STREAMBANK BIOSTABILIZATION	 B	For use along banks where stream and riparian zones may have difficulty recovering from the long-term effects of erosion.
ES40	POLYMERS		To minimize soil erosion and reduce sedimentation in water bodies by increasing soil particle size.
ES41	WATTLES	 B	In areas requiring protection of slopes against surface erosion and gully formation.

B = BIOENGINEERING

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S–E–S–C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
	SEDIMENT CONTROLS		
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S52	CATCH BASIN SEDIMENT GUARD		Use in or at stormwater inlets, especially at construction sites.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S54	TIRE WASH		For use on construction sites where vehicular traffic requires sediment removed from its tires in highly erosive areas.
S55	SEDIMENT BASIN		At the outlet of disturbed areas and at the location of a permanent detention basin.
S56	SEDIMENT TRAP		In small drainage areas, along construction site perimeters, and above check dams or drain inlets.
S57	VEGETATED BUFFER/FILTER STRIP		Use along shorelines, waterways, or other sensitive areas. Slows velocity, reduces sediment load, and reduces erosion in areas of sheet flow.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.
S59	INLET PROTECTION FABRIC FENCE		Use at stormwater inlets, especially at construction sites.
S60	INLET PROTECTION STONE		Use around urban stormwater inlets.
S61	TURBIDITY CURTAIN		Use during construction adjacent to a water esource, to contain sediment within the work area when other BMP's cannot be used.

B = BIOENGINEERING

SECTION 02511

HMA PAVING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes all labor, materials, tools and equipment necessary for complete construction of bituminous surfaces.

B. Related Sections:
Section 01025 MEASUREMENT AND PAYMENT
Section 02200 EARTHWORK

1.02 UNIT PRICES

Refer to Section 01025 MEASUREMENT AND PAYMENT

1.03 QUALITY ASSURANCES

A. Provide and place in accordance with 2020 MDOT Standard Specifications for construction.

B. Testing:
1. Provide material for bituminous extractions and aggregate analysis as requested by the Engineer.
2. Determine pavement density by Nuclear Gage Method using the test strip method.
3. All materials used as fill or sub-base shall be approved by the Engineer.
4. Determine gradation in accordance with ASTM C-136.
5. Determine percent loss by washing in accordance with ASTM C-117.

C. Base compaction:
1. Determine maximum density using the Modified Proctor Method, ASTM D-1557 or other engineer approved method.
2. Field determination of in place density shall be by Nuclear Density Method, ASTM D-2922, or other engineer approved method.

D. Furnish weight slips for all bituminous material.

PART 2 PRODUCTS

2.01 MATERIALS

A. Base material: Crushed bituminous material in accordance with current MDOT Standard Specifications for Construction, supplemented with MDOT 22A Aggregate.

B. Leveling course: MDOT 1 ½” 4EL

C. Wearing course: MDOT 1 ½” 4EL

D. Bond Coat: MDOT SS-1h.

E. Maximum AC % from RAP: 17%

F. AC shall be PG-58-28

G. HMA mixtures shall be current MDOT approved mix designs.

PART 3 EXECUTION

3.01 AGGREGATE PAVING BASE

A. Place a minimum depth of 6 inches compacted in place.

B. Extend paving base to the width required for gravel shoulders. Provide a minimum depth of 8 inches compacted in place for gravel shoulders.

C. Compact to 98% maximum density.

D. Adjust moisture content as required to achieve compaction.

E. Grading:
1. Finish grade base to the elevations and cross sections shown on the Drawings.
2. Do not place paving until the Engineer has approved the base.

3.02 HMA SURFACE

A. Apply bituminous paving in 2 course(s) of 1.5 inches and 1.5 Inches.

B. Compact by rolling to minimum of 92% theoretical maximum density.

C. Apply bond coat at a rate of 0.10 gal/syd between each pavement course.

D. Paver shall not lay pavement faster than 150 feet per minute.

3.03 PRESERVATION OR REMOVAL OF PAVEMENT SURFACES

A. Minimize the amount of existing pavement which must be removed.

B. Protect pavement outside of the payment limits.

C. Repair any damage to pavement surfaces outside of the payment limits at no cost to the Owner.

D. Saw cut pavement to full depth at removal limits.

3.04 TEMPERATURE AND SEASONAL LIMITATIONS

Refer to 2020 MDOT Specification for construction.

3.05 PAVEMENT PATCHING

A. Trench preparation: Place and compact backfill as specified in Section 02200 EARTHWORK.

B. Joint preparation:
1. Saw cut pavement a minimum of 1 foot beyond the damaged area.
2. Sweep adjacent road surfaces clean of all dirt and debris.
3. Apply a bond coat at a rate of 0.10 gal/syd on all saw cut edges of the existing pavement.
4. Butt joint new pavement to existing pavement.

C. Payment limits:
   1. Trench crossing road:
      a. A distance equal to the excavation depth plus the diameter of the pipe; measured perpendicular to and extending to both sides of the pipe line.

   2. Trench longitudinal to road:
      a. ¼ of pavement width to be replaced if less than ¼ is removed.
      b. ½ of pavement width to be replaced if more than ¼ but less than ½ is removed.
      c. full width to be replaced if more than ½ of pavement is removed.

D. Place aggregate paving base and bituminous surface as specified in paragraph 3.01 and 3.02.

END OF SECTION

SECTION 02513

CONCRETE SURFACES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes, all materials, labor, tools, and equipment necessary for the construction of concrete surfaces, including sidewalks and curb and gutter.

B. Related Sections:
1. Section 01025 MEASUREMENT AND PAYMENT
2. Section 02200 EARTHWORK

1.02 UNIT PRICES

Refer to Section 01025 MEASUREMENT AND PAYMENT

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete reinforcement:
1. Conform to MDOT Specification 905.

B. Concrete:
1. Conform to MDOT Specification 801.
2. MDOT 3500 psi concrete mix.

C. Joint filler:
1. Fiber joint filler conforming to ASTM D-1751.

D. Sand base:
1. Provide compacted sand base as specified in Section 02200, EARTHWORK.

E. Gravel base:
1. Provide compacted gavel base as specified in Section 02200, EARTHWORK.

PART 3 EXECUTION

3.01 EARTHWORK

A. Perform all earthwork necessary to conform to the finish grades shown on the Plans.

B. Prepare base as specified in Section 02200, EARTHWORK.

C. Backfill and compact all voids remaining after forms are removed.

3.02 CONCRETE PAVEMENT

A. Construct concrete pavement as shown on plans in conformance with Section 601 of the MDOT Standard Specifications for construction.

B. Dimensions:

1. Length: As required to replace existing, or as shown on Plans.
2. Width: Meet existing, or as shown on Plans.
3. Thickness: 9" minimum or greater if required to meet existing.
4. Slope: Meet existing, slope to drain.

C. Joints:
1. Concrete pavement joints shall be placed in a pattern as shown in MDOT Standard Plan R-42 series, "Joints for Concrete Pavement Widening".
2. Transverse construction joints, Symbol C, shall be placed to match joints in the existing pavement.

D. Reinforcement:
1. Wire fabric reinforcement shall be placed in all concrete pavement in accordance with MDOT Standard Plan R-45 series.

E. Finish: Finish surface in accordance with MDOT Specification 602.

3.03 SIDEWALKS

A. Construct in conformance with Section 803 of the MDOT Standard Specifications.

B. Dimensions:
1. Length: As shown on the Plans.
2. Width: As noted on Plans.
3. Thickness:
   a. 4" except where thickened at drive approaches.
   b. 6" at drive approaches as detailed on plans.
4. Slope: ¼" per foot toward curb.

C. Joints:
1. Expansion joints:
   a. Provide ½" expansion joints as shown on the Plans and as follows:
      i. At ends of thickened sidewalk.
      ii. At a maximum spacing of 50 feet.
      iii. Around permanent structures in sidewalk.
      iv. Between back of curb and sidewalk.
      v. Sidewalk ramps meet back of curb.
2. Plane of weakness joints:
   a. At intervals equal to the sidewalk width, or at a maximum 10 feet.
   b. In thickened sidewalk at outer edges of driveways.
   c. Where permanent structures are located in sidewalk.

D. Finish: Finish surface in accordance with MDOT Specification 803.

3.04 CURB AND GUTTER

A. Construct curb and gutter in accordance with Section 802 of the MDOT Standard Specifications.

B. All new curb and gutter shall be the Type, shown on the Plans.

C. Curb openings as detailed on Plans, installed at existing driveways at the location of existing curb openings.
D. Depressed curbs to 1" height at sidewalk ramps and driveway openings.

E. Joints:
1. Provide 1" expansion joints at:
   a. Saw cut curb ends.
   b. Curb radius spring points.
   c. Approximately 10 feet each side of all catch basins.

2. Provide contraction joints at:
   a. Opposite all transverse contraction joints in concrete pavement.
   b. At 40 foot maximum intervals.
3. Joints shall confirm with MDOT Standard Plan R-30 series.

F. Finish: Finish surface in accordance with MDOT Specification 802.

3.05 SIDEWALK RAMPS

A. Construct MDOT ADA sidewalk ramps with detectable warning strips (tactile strips) at all locations where new sidewalks meet curbs.

B. Construct in accordance with MDOT Special Detail R-28-J and Section 803 of the MDOT Standard Specifications.

C. Dimensions:
1. Length: As shown on the Plans.
2. Width: 5 feet, unless noted otherwise.
3. Thickness:
   a. 6" unless otherwise noted on Plans.
   b. Special thickness requirements are noted on the Plans.

D. Joints:
1. Provide control joints at 5 feet on center.
2. Provide expansion joints at intervals not exceeding 50 feet and between all abutting buildings and structures.

E. Finish: Finish surface in accordance with MDOT Standard Specification Section 803.

END OF SECTION

SECTION 02900

SITE RESTORATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Work necessary to restore all disturbed surfaces and facilities to equal or better condition.
   2. Provide, establish, and maintain seed, fertilizer, mulch, and erosion control materials.

B. Related Sections
   01025 MEASUREMENT AND PAYMENT
   02200 EARTHWORK
   02270 EROSION CONTROL

1.02 UNIT PRICES

All work under this Section shall be considered incidental to the work unless specifically indicated on the BID SCHEDULE and referred to in Section 01025 MEASUREMENT AND PAYMENT.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Provide topsoil as specified in Section 02200 EARTHWORK.

B. Seed: Provide seed mixture composed of the following proportion by weight:

Creeping Red Fescue	35%
Kentucky Blue Grass	15%
Perennial Rye Grass	50%

C. Fertilizer:
   1. Provide chemical fertilizer with a 12-12-12 mixture of Nitrogen (N), Phosphoric Acid (P_2O_5), and Potash (K_2O).
   2. Provide net weight of contents and guaranteed analysis.

D. Mulching: Provide straw, hay, or other material conforming to 2020 MDOT Standard Specifications as approved by the Engineer.

PART 3 EXECUTION

3.01 TOPSOIL PREPARATION

A. General:
   1. Prepare topsoil after finish grading of surfaces.
   2. Prepare soil to a friable condition by discing, harrowing, or otherwise loosening the soil to a depth of 3 inches.
   3 Break up all lumps of soil.
   4. Rake out all rocks and debris.

3.02 FERTILIZING

A. Apply evenly on the prepared surface at a rate of 240 pounds per acre.

B. Drill or broadcast method, placed no deeper than 1 inch.

3.03 SOWING

A. Sow grass at a minimum rate of 100 pounds per acre.

B. Method:
1. Sow the seed following or in conjunction with the fertilizer.
2. Sow only while soil is in a friable condition.
3. Do not sow through mulch.
4. Sow seed mixture by drill or broadcast method.
5. Float seed sown by broadcast method so that 50% of the seed is mixed with the top 2 inch of the soil.

C. Hydroseeding:
1. Apply seed, fertilizer, and mulch in one application.
2. Mulch shall be a wood fiber material.
3. Apply at a rate of 1440 pounds per acre.

D. Watering:
1. Water all seeded areas to establish a smooth and full vegetative cover.
2. Should erosion occur or the seed not grow within the guarantee period, regrade and reseed the disturbed area at no additional cost.

E. Erosion control:
1. Provide measures necessary to establish well rooted vegetation on slopes and ditch bottoms.
2. Protect seeded slopes with netted mulch blankets or other suitable methods.

F. Seasonal limitations:
1. Apply seed between May 1 and October 1.
2. Dormant seeding:
   a. Permitted in limited areas to complete a project.
   b. Apply after November 1, but not on frozen ground.

3.04 MULCHING

A. Apply at a rate of 2 bales per 1000 square feet.

B. Method:
1. Apply immediately after seeding.
2. Apply evenly and loose enough to allow sunlight and air to penetrate, but thick enough to reduce the rate of evaporation and erosion.
3. Apply mulch adhesive as necessary at a rate of 150 gallons per acre.

END OF SECTION