Division 01

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT BACKGROUND

The Flint Bishop Airport Landfill (FBAPL) is located within the Bishop International Airport fenced area at the northwest end of the east-west runway. The site is bordered by the Swartz Creek, a drainage ditch that outlets into Swartz Creek, and the Hewitt Drain that also outlets into the Swartz Creek, and covers approximately 33 acres. The facility operated as a city dump from 1966 until 1975. In 2016 and 2025 the Michigan Department of Environmental Quality (MDEQ, now EGLE) determined Flint was not a viable liable party.

Leachate from the landfill exceeded groundwater surface water interface (GSI) and drinking water criteria for benzene in a 2006 sample. Additional investigations identified arsenic above soil direct contact, GSI, and drinking water criteria. Contaminants in leachate and groundwater above GSI include Arsenic, Barium, Selenium, Silver, PCBs, DDT, phthalates, and VOC's. Soil contamination above GSI protection criteria includes Mercury, Arsenic, Cobalt, Copper, Manganese, and Selenium.

To limit infiltration and reduce contaminant migration to the Swartz Creek EGLE has proposed the development of a landfill cap.

1.02 PROJECT HISTORY AND PREVIOUS INVESTIGATIONS[1]

The facility operated as a city dump from 1966 until 1975. An environmental assessment was conducted by NTH Consultants, Ltd. (NTH) at the site of the former Bishop Airport Landfill in Flint, Michigan. The scope of work was based on the “Work Plan for Bishop Airport Landfill Disposal Area," (Work Plan) prepared by GEO-Environmental Resources, Inc., dated August 15, 2007. That Work Plan provided a thorough review of the site location, ownership, and history.

In summary, the landfill is located on what is now part of the Flint Bishop International Airport, near the western end of the primary east-west runway (Runway 9-27). The landfill is comprised of two separate disposal areas. Landfill I (the subject fill area in these Contract Documents) occupies approximately 33 acres and is generally bounded by the South Branch of Swartz Creek to the east, the airport runway to the south, the Hewitt Drain to the west, and a ditch adjoining the Grand Trunk Western Railroad right-of-way to the north. The current environmental assessment focused primarily on Landfill I. Landfill II

[1]Work Plan for Bishop Airport Landfill Disposal Area, GE0-Environmental Resources, Inc., August 15, 2007.

occupies approximately 35 acres and is generally bounded by the same ditch along the north side, the Hewitt Drain to the east, the Bishop Airport property boundary to the south, and Linden Road to the west. Landfill II is outside the scope of work.

The site was licensed by the City of Flint under the Michigan Department of Public Health, beginning in 1966. The site was used for disposal of municipal waste until 1975. Regulations in place at the time of landfill closure did not require the installation of an impermeable cap. So, consistent with prevailing practice at the time, the waste was likely covered with a mixture of granular and clay soils. Since closure of the landfill, extension of the airport runway necessitated realignment of Swartz Creek, which resulted in a portion of the creek being enclosed in a culvert under the runway. In addition, additional fill soil has been placed on portions of the landfill, and a perimeter fence was installed.

In 2006, the MDEQ (now EGLE) noted a leachate seep along the northern side of Landfill I. Liquid was apparently observed discharging to the unnamed ditch adjacent to the landfill, which ultimately discharges to Swartz Creek. Subsequently, City of Flint staff has documented and monitored a number of groundwater seeps and vents along the landfill boundaries, which recur seasonally. Periodically during these site inspections by City personnel, indications of methane generation from the landfill have also been observed, including bubbling in surface water puddles on the landfill.

1.3 SCOPE OF WORK

A. General information covering the "Scope of Work" is specified in the Advertisement. Additional information is as follows:

1. The work is to be performed according to all local, state and federal regulations. The enclosed Drawings and Specifications detail the applicable requirements for completing this work. In general, the work will include:

a. Clearing and grubbing of trees and brush. Proper abandonment of existing monitor wells.

b. Removal/incorporation of debris. Cutting, filling and grading of area to receive cap.

c. Constructing a cap which will consist of 1.0 ft of sand (gas collection) layer, Geosynthetic Clay Liner (GCL), 1.0 ft of drainage layer, 1.0 ft of general fill, and 6 inches of topsoil with seeding.

d. Installation of gas vents.

e. Installation of pipes and structures for leachate/groundwater collection under the cap.

f. Construction of new perimeter roads and temporary roads around the landfill.

g. Installation of new monitoring wells.

h. The construction of temporary and final fencing.

i. Construction of temporary drain crossing. Removal of temporary drain crossing.

j. All associated activities presented in the Specifications and Drawings.

B. The State Unit will provide the following Work:

State Salvage: The State reserves the right to salvage certain items and equipment. Such items will be identified to the bidder at the time of his/her inspection of the proposed Work. Salvaged items will be removed by the State prior to commencement of Work under the Contract.

1.4 DEFINITIONS

A. **"CQC/CQA Plan"**
Construction Quality Control/Construction Quality Assurance Plan – This plan is integral to the specifications.

B. **"EGLE" or "Owner"**
Michigan Department of Environment, Great Lakes, and Energy.

C. **"Engineer" or "Professional"**
DLZ Michigan, Inc., also referred to as the "Professional".

D. **"MDHHS"**
Michigan Department of Health and Human Services

E. **"Project Manager (PM)"**
Refers to the Owner's project manager assigned by EGLE.

F. **"Owner's Representative"**
Person(s) assigned by the Owner to represent itself on this project - this person could be the Project Manager.

Refer to Section 00700 General Conditions for additional definitions.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION 01010

SECTION 01121

HAZARDOUS MATERIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 GENERAL

A. The materials to be excavated and moved/regarded at the site are understood to be top soil, clay cover materials, household Type II wastes and demolition materials. Appendix V contains information of past soils/groundwater sampling results and Appendix VI contains resent sampling results. If the Contractor encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the Contractor must immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions.

B. The Contractor must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material in accordance with all Federal, State and local Laws

C. Hazardous Materials are regulated by the EGLE Materials Management Division (MMD), and Remediation and Redevelopment Division (RRD), in carrying out the requirements of the United States Environmental Protection Agency (EPA). For general information and/or a copy of the latest regulations and publications, call (800) 622-9278 Environmental Assistance Center (EAC).

D. The Michigan Occupational Safety and Health Administration (MIOSHA) provides regulations for the safety and health of workers.

1. Contractor shall post any applicable local, State and/or Federal government regulations at the job site in a prominent location.

2. Contractor shall be responsible for training their workers in safe work practices and proper removal methods when coming in contact with hazardous chemicals.

E. Applicable regulations, include, but are not limited to:

State

1. Natural Resources and Environmental Protection Act – PA 451 of 1994, as amended.

2. Part 211, Act 451 - Underground Storage Tanks.

3. Part 213, Act 451 - Leaking Underground Storage Tanks.

4. Part 111, Act 451, 1994 - Michigan Hazardous Waste Management Act: This statute regulates generation, transportation, treatment, storage, and disposal of hazardous wastes in Michigan.

5. Part 115, Act 451, Solid Waste Management.

6. Part 121, Act 451, 1994 - Liquid Industrial Waste Act: This statute regulates the transportation of liquid industrial wastes in Michigan. This includes non-hazardous liquids and hazardous liquids, which are not subject to management under RCRA or Part 111, Act 451, 1994.

7. Part 147 – PCB compounds

8. All applicable MDOT regulations.

Federal

1. RCRA, 1976 - This Federal statute regulates generation, transportation, treatment, storage, or disposal of hazardous wastes nationally.

2. Toxic Substances Control Act (TSCA), 1976: This statute regulates the generation, transportation, storage, and disposal of wastes, including polychlorinated biphenyls and asbestos.

F. Definitions: Hazardous substances are ignitable, corrosive, reactive, and/or toxic, based on the respective chemical characteristics. Wastes are hazardous based on characteristics or by being a listed waste.

G. Disposals:

1. To use an off-site hazardous waste disposal facility, the **CONTRACTOR** must use the Uniform Hazardous Waste Manifest (shipping paper).

2. Hazardous waste may not be disposed in sanitary landfills used for solid waste.

H. Federal, State, and local laws and regulations may apply to the storage, handling, and disposal of hazardous materials and wastes. The list below includes the regulations that are most frequently encountered.

Topic	Agency and Telephone Number
Small quantity hazardous waste management, including hazardous waste stored in tanks	EGLE EAC or District Office Certified County Health Departments
Liquid industrial waste disposal (hazardous and non-hazardous)	EGLE EAC, or District Office
Disposal of hazardous waste into	Contact the superintendent of the local wastewater

municipal sanitary sewers	treatment plant for permission
Discharges to surface water such as through a drain pipe or wastewater discharge	Water Resources Division, EGLE EAC, or District Office
Discharges to groundwater, including septic systems	EGLE EAC, or District Office, or County Health Departments (if less than 10,000 gallons/day)
Material storage permits	EGLE EAC, or District Office
Pollution Incident Prevention Plans (PIP Plans)	EGLE EAC, or District Office County Health Departments assisting with ground-water program administration
Hazard Communication Standards (for chemicals in the work place)	Michigan Department of Licensing and Regulatory Affairs, Michigan Occupational Safety & Health Administration Consultation Education & Training Division
Burning of waste oil and other discharges to the air	Air Quality Division EGLE EAC, or District Office
24-hour EGLE Pollution Emergency Alerting System (PEAS)	1-800-292-4706
Registration of underground fuel storage tanks	EGLE EAC, or District Office
Installation, inventory, testing and other requirements for above ground and underground storage tanks (for flammable and combustible liquids)	EGLE EAC, or District Office
Local fire prevention regulations and codes (including chemical storage requirements)	Local fire chief or fire marshal
Building and outdoor storage requirements (including setbacks)	Local government building or zoning official

I. EGLE Office

Michigan Department of Environment, Great Lakes, and Energy
Lansing District Office
525 West Allegan
Deborah Stabenow Building, 1st Floor
Lansing, Michigan 48909
517-284-6651

J. Contact the Environmental Assistance Center (EAC) of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) at 1-800-662-9278, or e-mail to: EGLE-Assist@michigan.gov for general EGLE information including direct and referral assistance on air, water and wetlands permits; contaminated site clean-ups; underground storage tank removals and remediation; hazardous and solid waste disposal; pollution prevention and recycling; and compliance-related assistance. The Center provides businesses, municipalities, and the general public with a single point of access to EGLE's environmental programs.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Professional.

A. Unit Price Items

Payment items for the work of this contract on which the contract progress payment will be based are listed in the contract documents, Bid Schedule and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, safety requirements, sampling, tests, and reports, and for performing all work required for each of the unit price items. Payment is contingent upon approval of all applicable submittals. Payment shall be paid for the actual amount of Work accepted. The amount will be in accordance with prices submitted on the Bid Schedule. Payment listed by the ton shall be measured by the weight of the materials via a certified scale as per section 1.09.01.B.6 of the 2012 Standard Specifications for Construction by Michigan Department of Transportation (MDOT). All the fill materials brought to site shall be measured by the certified scale, as identified by the Contractor and approved through the submittal process.

B. Lump Sum Items

Payment items for the work of this contract for which Contract lump sum payments will be made are listed in the contract documents, Bid Schedule and described below. Contract progress payments for lump sum items will be paid for based on the approved schedule of values. All cost for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, safety requirements, sampling, tests and reports, and for performing all work required for which separated payment is not otherwise provided. Payment is contingent upon approval of all applicable submittals. Payment shall be paid on the Work completed and accepted. One hundred percent of the Contract price for the Work completed and accepted may be paid, subject to the limitations of the Contract Documents. The Owner reserves the right to pay the Contract a portion of a lump sum line item, if all of the Work originally tasked is not performed as stated herein, as determined by the Professional.

C. Provisionary Allowance Items

Payment for work under a Provisionary Allowance is subject to issuance of a Change Authorization. A Change Authorization is a written order approved by the Owner and issued by the Professional, which directs changes in the Work that requires no adjustment to Contract Price or Contract Time. Monies in the allowance will be used only if directed in writing by the Project Manager and Professional. Unused allowance monies will be deducted from the contract amount through contract change order. Also refer to Section 00700, 6.7.

D. Cash Allowance Items

Payments under a Cash Allowance must be on actual cost and exclude cost for supervision, handling, unloading, storage, installation, testing, fee, premiums for bond and insurance, markups, etc. Monies in the cash allowance will be used only if directed in writing by the Project Manager and Professional. Also refer to Section 00700, 6.7.

1.02 PAYMENT

A. Refer to Division 0 Section 0700.

B. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted, in accordance with the Contract Documents. Upon completion of the Work, if the actual quantities show a decrease or increase from the quantities included in the Contract, the Contract extended prices will prevail, except as provided hereinafter.

C. The Contractor shall accept compensation, as provided herein, as full payment to furnish all materials, labor, tools, equipment, and incidentals necessary to complete the Work; for performing all Work stated by the Contract; for all loss or damage arising from the nature of the Work, from the action of the elements, or from any unforeseen difficulties that may be encountered during the execution of the Work and until its final acceptance by the Professional and Owner; for all risks of every description connected with the execution of the Work, except as provided herein; and for all expenses incurred in consequence of the suspension of the Work, as herein authorized.

D. No extra payment or contract extensions will be made to the Contractor for any expense or delays caused by the revision of inadequate submittals, lack of progress, weather, defective workmanship, or rescheduling.

E. Additional costs caused by ill-timed or defective Work, or Work not conforming to the Contract Documents, shall be incurred solely by the Contractor.

F. Final Application for Payment shall be submitted pursuant to the Contract Documents.

G. **The estimated quantities for unit price pay items, as listed in the Bid Schedule, are**

approximate only and are included solely for the purpose of comparison of Bids. The Owner and Professional do not express or by implication agree that the actual quantities of material encountered or required will correspond with the Bid Schedule. The Owner reserves the right to increase, decrease, or eliminate any quantity deemed necessary. When alterations in quantities are within plus or minus 20 percent of the original estimated quantity of Work listed on the Bid Schedule, the Contractor will not be entitled to any adjustments in the unit bid price as a results of any changes in the estimated quantities, and agrees to accept the aforementioned unit bid prices as complete and total compensation for any additions caused by changes or alteration in the Work and ordered by the Owner and Professional. Also refer to Section 00700, 10.6.

H. When alterations in quantities are greater than plus or minus 20 percent of the original estimated quantity of Work listed on the Bid Schedule, the Contractor will be required to document, to the satisfaction of the Professional, all labor, materials, and equipment costs related to the increase/decreased quantity. Also refer to Section 00700, 10.6.

1.03 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. Payment for increased or decreased quantities shall be as specified in the Contract Documents.

B. Increased or decreased work involving Change Orders will be paid for, as stipulated in such Change Orders.

1.04 INCIDENTAL WORK

A. Work items for which separate payments are not measured, but are included as part of the Contract include, but are not limited to, the following:

1. Field supervision
2. Jobsite administration
3. Disposal of rinseate and decontamination water and all associated sampling, analysis, permits and fees
4. Dust monitoring and control
5. Project record documents
6. All temporary fencing and barriers
7. Restoration of disturbed areas not designated or described in these Contract Documents
8. Health and safety requirements
9. Cooperation with other subcontractors
10. Environmental protection
11. Control of surface water and runoff water entering the site and excavations
12. Locating, protecting, disconnecting, removing, replacing, and capping in-place of site utilities, as applicable
13. Site cleaning including street sweeping/cleaning
14. All activities required to conform to MDOT and FAA standards and regulations and

permit requirements, that are not specified herein

15. QA/QC
16. Invoicing/billing
17. Storage of equipment

1.05 SPECIFIC BASE BID PAY ITEMS

A. Contract Item No. 1: Mobilization (Lump Sum)

Payment for Mobilization shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, tools, materials, storage, and equipment for the movement and establishment of Contractor's facilities, equipment, personnel, security, supplies, and incidentals to perform the work.

B. Contract Item No. 2: Site Services (Lump Sum)

Payment for Site Services shall be paid for at the Contract Lump Sum price. Schedule of Values for this item shall reflect payment based off the percentage of the work which has been completed. The total sum of all payments for this item shall not exceed the original contract amount bid for this item, regardless of the fact that the Contractor may have, for any reason, shut down his work on the project, moved equipment away from the project and then back again, or for additional quantities or items of work added to the contract This item shall include all labor, transportation, equipment, tools, incidentals, materials, and subcontracting services for site security; protection of utilities and structures to remain in place; establishment, protection, acquisition and maintenance of temporary and/or permanent utilities; dust, odor, and surface water controls; soil erosion and sedimentation controls; installation, maintenance, and removal of a temporary storm water management system; temporary sanitary facilities; installation, maintenance, and removal of soil erosion and sedimentation control measures as approved by the Professional and as required by the permit; decontamination; disposal of decontamination water; dust control; air monitoring; site cleaning; performance and payment bond premiums; insurance premiums as required by the Contract; acquisition of all necessary permits, notifications, certifications, and authorizations to conduct work; protection of utilities and structures to remain in place; barricades and traffic control; project coordination; project meetings; staging and material storage; temporary office; road maintenance; pre-and post- construction submittals/plans, proper decontamination of all equipment and materials; disposal of decontamination water; all required Construction Quality Assurance (CQA) Plan sampling and analytical testing associated with site services and all other Contractor work tasks not stated herein but that are included in these specifications or necessary to perform the work, which are not part of other bid items. This pay item shall also include all cost associated with all Contractor's health and safety activities including but not limited to, monitoring of ambient and excavation atmospheres, respiratory and dermal protection and personal protective clothing and equipment; and for the other work and operations which must be performed, or for expenses incurred, prior to beginning work on the various contract items on the project site. It shall also include pre-construction costs, exclusive of bidding costs which are necessary direct cost to the project and are of a general nature

rather than directly attributable to other pay items under the contract.

C. Bid Item No. 3: Clearing and Grubbing (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item shall include all labor, equipment, tools, incidentals, materials, and subcontracting services for the removal/handling/spreading and proper placement of chipped trees, stumps, brush, vegetation and other miscellaneous debris within the boundaries of the construction activities.

D. Bid Item No. 4: Soil Erosion, Sedimentation, and Stormwater Control (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item shall include all labor, transportation, equipment, tools, incidentals, materials, and maintenance, for the Soil Erosion and Sedimentation Control (SESC), as specified in Section 02370, the Drawings, and as required by the SESC permit; development of a stormwater management plan and the construction of storm water control structures, berms, ditches, check dams, sedimentation basins, grading and erosion control mats for the entire project. Stormwater control structures include all pipe, spillways, culverts, catch basins and covers, excavating, grading, backfilling and compacting and all other appurtenances for stormwater control structures as described in the specifications and drawings. Fill materials (i.e., general fill, granular fill, rip rap and peastone) are paid for separately.

E. Contract Item No 5: Grading (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item includes all labor, equipment, tools, materials, and services necessary for excavation, phasing, storing, and grading of existing onsite cover materials, refuse, and general fill to construct the subgrade to the proposed subgrade elevations, within the limits of construction, as shown on the drawings and the CQA Plan. It shall also include all necessary surveying not included in Site Services pay item; the backfilling, placing, compacting and environmental controls of the existing cover materials and general fill for the subgrade construction as described in the specifications and drawings. Grading for the access and landfill roads shall be included herein. General fill is paid for separately.

F. Contract Item No 6: General Fill (Ton)

Payment for this item shall be paid for at the Contract Unit Price per ton. This item includes all labor, equipment, tools, testing, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the General Fill materials utilized for construction of the cap or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

G. Contract Item No 7a: Structural Fill (Ton)

Payment for this item shall be paid at the Contract unit price per ton. This item includes all labor, equipment, tools, testing, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the Structural Fill materials utilized for construction of the temporary drain crossing, Leachate Manhole, and culverts or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

H. Contract Item No 7b: Granular Material (Ton)

Payment for this item shall be paid at the Contract unit price per ton. This item includes all labor, equipment, tools, testing, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the Granular Material utilized for construction of the venting and drainage layers or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

I. Contract Item No 8: MDOT 22A Aggregate (Ton)

Payment for MDOT 22A Aggregate shall be paid at the Contract unit price per ton. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the MDOT 22A Aggregate materials utilized for construction of the roads or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

J. Contract Item No 9: MDOT 6A Aggregate (Ton)

Payment for MDOT 6A Aggregate shall be paid at the Contract unit price per ton. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the MDOT 6A Aggregate materials utilized for construction of the roads or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

K. Contract Item No 10: Topsoil (Ton)

Payment for Topsoil shall be paid at the Contract unit price per ton. This item includes all labor, testing, equipment, tools, and materials necessary to acquire, handle, transport, place, compact, and grade these soil materials according to specifications and drawings. Payment shall only be made for the weight of the Topsoil materials utilized for construction

of the cap and all other disturbed areas due to the work as approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

L. Contract Item No 11: MDOT Plain Rip Rap (Square Yard)

Payment for MDOT Plain Rip Rap shall be paid at the Contract unit price per square yard. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place rip rap of 8 inches diameter or greater and a geotextile layer beneath the rip rap according to specifications and drawings. Payment shall only be made for the weight of the rip rap/geotextile materials utilized for construction of the cap, drain crossing, SESC, stormwater control, or as approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

M. Contract Item No 11a: 1”x3” Crushed Stone (Square Yard)

Payment for 1”x3” crushed stone shall be paid at the Contract unit price per square yard. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place 1”x3” crushed stone along the southern edge of the landfill according to specifications and drawings. Payment shall only be made for the weight of the riprap/geotextile materials utilized for construction of the cap, drain crossing, SESC, stormwater control, or as approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

N. Contract Item No 12: Asphalt (Ton)

Payment for Asphalt shall be paid at the Contract unit price per ton. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place, and compact these materials according to specifications and drawings. Payment shall only be made for the weight of the Asphalt materials utilized for construction of the roads or other areas approved by the Engineer. This item also includes providing weigh tickets (approved scale) to verify the quantity of material brought to the site.

O. Contract Item No 13: Geosynthetic Clay Liner (Square feet)

Payment for the Geosynthetic Clay Liner (GCL) will be by the square feet of liner installed. Measurement for the GCL will be performed by the planimetric measurement of the placed liner as determined by survey and verified by the QAC Officer. The measured area will not include additional compensation for overlaps, additional areas due to slopes, patches, vertical runs (i.e., trench), boots or other excess GCL material which was trimmed and wasted. This item includes supplying and installing the GCL above the gas venting fill layer for the cap including the specified testing, protection, reporting, and repairing and maintaining of the GCL panels and seams prior to placement of the sand drainage layer in accordance with the CQA Plan and specifications.

P. Contract Item No 14: Geotextile- Woven (Square feet)

Payment for the Geotextile- Woven will be by the square feet of geotextile installed. Measurement for the Geotextile will be performed by the planimetric measurement of the placed material as determined in the field and verified by the QAC Officer. The measured area will not include additional compensation for overlaps, patches, or other excess material which was trimmed and wasted. This item includes supplying and installing Geotextile for road construction including, protection, reporting, repairing and maintaining of the material in accordance with the specifications. Geotextile for rip rap is paid for under the MDOT Plain Rip Rap Pay item.

Q. Contract Item No 15a: Gas Vents (Each)

Payment for the Gas Vents will be by each vent installed. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, excavate, place, removal and grading of spoils, backfilling and placing of aggregates, installing piping and all other materials according to the specifications and drawings for the construction of the vent. Aggregates will be paid for separately.

R. Contract Item No 15b: Monitoring Well Installation (Each)

Payment for the monitoring wells will be by each well installed. This item includes all labor, equipment, tools, and materials necessary to drill and install monitoring wells according to the specifications and drawings for the construction of the wells.

S. Contract Item No 16: Temporary Fence (LFT)

Payment for the Temporary Fence will be by linear foot of temporary fence installed. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place, removal, installing fence material and barricades and all other materials according to the specifications and drawings for the construction of the temporary fence. This item shall also include the removal of the existing fence as identified on the drawings. The removed fence shall become the property of the Contractor.

T. Contract Item No 17: Permanent Fence (LFT)

Payment for the Permanent Fence will be by linear foot of Permanent Fence installed. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, place, removal, installing fence material, repair of penetrated GCL and all other materials according to the specifications and drawings for the construction of the Permanent Fence.

U. Contract Item No 18 Turf Establishment (Acre)

Payment for Turf Establishment shall be by acre of Turf Establishment completed. Measurement for the Turf Establishment will be performed by the planimetric measurement of the established turf as determined in the field and verified by the Engineer This item includes all labor, transportation, equipment, tools, incidentals, materials, and subcontracting services necessary for establishing (and maintaining for one year after Substantial Completion), turf for all disturbed areas, grading of all disturbed areas, seed, fertilizer, mulch, erosion mats, repairs/replacement of monitoring wells outside of excavation, watering and vegetation establishment, and general cleanup of the site. All work shall be performed in conformance with MDOT standards, local standards, and the Specifications and Drawings, whichever is stricter.

V. Contract Item No 19 Cap Drain-4” Dia. Perforated Tile (LFT)

Payment for the Cap Drain shall be paid for at the Contract unit price per lineal foot. This item includes all labor, equipment, tools, and materials necessary to acquire, handle, transport, excavate, and place, 4” diameter perforated pipe with geotextile wrap, peastone, and all other materials according to the specifications and drawings for the construction of the Cap Drain.

W. Bid Item No. 20: Leachate Collection System (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item shall include all labor, equipment, tools, incidentals, materials, and subcontracting services for the installation of the concrete manhole/cover/casting, leachate pump and controls, power, piping, valves, excavation, and all other appurtenances as described in the specifications and drawings. Fill materials, aggregates, and geotextiles shall be paid for separately.

X. Contract Item No 21: Operation and Maintenance of Leachate Collection System (Month)

Payment for Operation and Maintenance of Leachate Collection System shall be paid at the Contract Unit Price per month of successful operation and maintenance. This item includes all labor, tools, equipment, testing, and materials necessary to perform operation and maintenance, including but not limited to reporting, routine and non-routine maintenance, troubleshooting when the system is malfunctioning or non-operational, calibration, adjusting and balancing, and cleaning for a period of 12 months. The entire system must operate at least 90% up time per calendar month, in order to receive full payment. If the system operates at less than 90% of the time, a reduction in the pay item shall be made based on a prorated percentage of the actual up time (i.e., If the run time was 89% for a given month, then 89% of the pay item shall be paid), irrespective of the cause of the down time, unless otherwise waived by the PROFESSIONAL or OWNER. The **CONTRACTOR** shall be responsible for all maintenance, monitoring, and sampling. This item also includes the cost for providing an onsite Frac tank during the O&M period. The Frac tank shall be removed at the end of the O&M period.

Y. Contract Item No 22: Removal and Disposal of Leachate (Gallon)

Payment for Removal and Disposal of Leachate shall be paid for at the Contract unit price per gallon. This item shall include all labor, tools, equipment, and materials required for the removal, transportation, and proper disposal of landfill leachate removed from the cap drainage system as specified in Specifications. This item also includes all sampling, analysis, and permits necessary for disposal of the liquids, as applicable.

Z. Contract Item No 23: Drain Crossing (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum Price. This item shall include all labor, equipment, tools, incidentals, materials, permitting, and subcontracting services for the installation of corrugated metal culverts, and all other appurtenances as described in the specifications and drawings. Fill materials (except peastone bedding), aggregates, geotextile, rip rap shall be paid for separately. This item shall also include the removal of all materials used in the construction of drain crossing, from the premises, and the return of the drain, drain banks, and connecting areas back to their original state; which includes all grading, top soiling, and turf establishment. The culverts and removed soils shall become the property of the Contractor.

AA. Contract Item No 24: Demobilization (Lump Sum)

Payment for this item shall be paid for at the Contract Lump Sum price. This item shall include all necessary labor, transportation, equipment, tools, incidentals, materials, storage, and subcontracting services for the removal of Contractor's facilities, equipment, personnel, security, supplies, and incidentals at the conclusion of the work including the removal (at the conclusion of work) of access roads, ramps, and exits; removal of temporary storm water management system; and removal of temporary sanitary facilities, and soil erosion and sedimentation control measures upon approval of the permitting agency and

as approved by the Professional/Owner.

BB. Contract Item No 25: Owner's Allowance (Provisionary Allowance)

A provisionary allowance of $150,000.00 shall be included, in the event that unforeseen conditions arise, and/or for additional work at the site, as identified by the Professional. This allowance may only be used upon approval by the Owner and change authorization by the Professional. Payment shall be in accordance with the conditions of the Contract Documents. The Contractor shall provide appropriate backup documentation with payment request.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01271

PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

A. Submit all progress and final Applications for Payment, in accordance with the approved Schedule of Values (see Section 01290).

B. An original copy of each Application for Payment shall be submitted to the Professional**.**

C. Each Application for Payment for shall cover one calendar month.

D. Submit all Applications for Payment with itemized charges and support documentation.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.01 PREPARATION

A. Progress Application for Payment

Progress applications for payment shall be prepared in accordance with the Contract Documents and formatted as follows:

1. Application Form (DMB Form 440)

   a. Fill in required information, including that for Change Orders executed prior to the end date of the service period (one month).
   b. Fill in summary of dollar values, to agree with respective totals indicated on continuation sheets.
   c. Execute certification with signature of a responsible officer for the Contractor. The document must also be notarized.
   d. Include the dates of the Application for Payment service period (one month).

2. Continuation Sheets (AIA G702 and G703)

a. Each payment request shall be prepared on American Institute of Architects (AIA) Forms G702 and G703: Application and Certification for Payment Form.
b. Fill in total of all scheduled component items of Work, with item number and scheduled dollar value for each item.
c. Fill in dollar value in each column for each scheduled line item when Work has been performed.
d. List each Change Order executed prior to the end date of the service period at the end of the continuation sheets. List by Change Order number, and description.

3. Support Documentation

Include all documentation (i.e. weight tickets, manifests, utility bills, subcontractor invoices, Operation and Maintenance Forms, analytical data) that supports each line item during the applicable Application for Payment service period. The support documentation shall cover each line item requiring back up data, as applicable or as determined by the Professional. The Professional shall not recommend payment for any payment request that does not have all of the required support documentation, until all required documentation has been submitted.

B. Application for Final Payment

The Contractor must notify the Professional when the Work will be Substantially Complete. If the Professional agrees that the project is Substantially Complete, the Professional will review the Work. The Professional, upon determining that the Work, or a portion of the Work viewed, is substantially complete, will prepare a Punch List and will attach it to the respective Certificate of Substantial Completion. The Contractor must be represented on the job site at the time this review is made and thereafter must complete all Work by the date set for final acceptance by the Owner.

Application for final payment shall be prepared in accordance with the Contract Documents and the following:

The Contractor shall submit the following to the Professional in order to receive payment after substantial completion has been reached (the exact forms may differ):

1. Written notification to the Owner indicating that the project is complete (substantial completion)
2. Application for Payment forms (substantial completion and final payment)
3. If the project is bonded, consent to make final payment from the bonding company with power of attorney (final payment)
4. Guarantee and Indebtedness Statement form (DMB 437) (substantial completion)

5. Certificate of Substantial Completion for the Contract Work form (DMB 445) (substantial completion and final completion). This form must be dated to reflect actual date of substantial completion and final completion, as appropriate.
6. Request to adjust the contract amount to coincide with actual cost of Work performed (final payment)
7. Any other submittals, as required by the Owner (substantial completion and final payment)

3.02 UNCOMPLETED AND DEFECTIVE WORK

A. Upon Substantial and/or Final Completion of the Work, or designated part of the Work on which separate Contract times and Contract Price are specified, payment may be made in full subject to the following:

1. A withholding of two hundred percent (200%) of the value of any uncompleted Work, as determined by the Professional.

2. Any other deductions as the Professional may recommend or the Owner may withhold to cover defective work, liquidated damages, and the fair value of any other items entitling the Owner to a withholding.

END OF SECTION

SECTION 01290

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SCHEDULE OF VALUES

The Schedule of Values is an itemized list that establishes the value or cost of each line item, including lump sum and unit priced items. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional Work or credits, which may arise during the construction. Quantities and unit prices may be included in the Schedule of Values, when approved by or required by Professional.

1.02 PREPARATION

A. The Schedule of Values shall be prepared in accordance with the Contract Documents and additionally shall include:

1. Project name and location
2. Project number
3. Name, address, and phone number of Contractor
4. Date of submission

B. Cost itemizations shall be in sufficient detail to indicate separate values for each part of the Work. The Contractor is required to submit a detailed breakdown of each line item for this project. The breakdown, at a minimum, will include labor, tools, material, equipment, sampling costs, insurance, bonds, and subcontractor costs.

C. When requested by the Professional, support values with data that will substantiate their correctness.

D. The sum of the individual values for all tasks shown on the Schedule of Values must equal the total Contract price.

E. The Schedule of Values may separately itemize the costs of purchase and delivery and the costs of installation, if the Contractor intends on requesting payment for these activities prior to installation.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01320

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 PROJECT COORDINATION:

A. Prior to beginning the Work, the Contractor shall meet with the Professional in order to arrange the schedule for the project. Once the project is started, it shall be carried to completion without delay.

B. Phasing of Work shall be clearly established and verified through the Professional prior to commencing Work in any area. No site work shall begin until authorized by the Owner or Professional.

C. The Contractor is responsible for contacting MISS DIG, property owner, and all other applicable utility companies, a minimum of three working days prior to work start. MISS DIG 1-800-482-7171.

D. All communications, submittals, questions, etc. shall be directed to the Professional throughout the duration of the project.

1.02 PRE-CONSTRUCTION MEETING

A. The Professional shall schedule a Pre-construction Meeting to be attended by the EGLE Project Manager, Professional, Property Owner, and Contractor. When no organizational meeting is called, the Contractor, prior to beginning of any Work, shall meet with the Professional to arrange a Work schedule for the project. A project kick-off meeting shall be conducted immediately prior to the start of work if required by the Owner or Professional. Once the project has been started, the Contractor shall carry it to completion without delay. Meeting minutes shall be generated by the Professional and distributed to all attendees.

B. Comply with requirements stated in the CQC/CQA Plan.

1.03 PROGRESS MEETINGS

A. The Professional will schedule weekly progress meetings, to be held on the job site and attended by the Contractor, Professional, EGLE Project Manager, and others involved in the construction activities. Progress meetings may also be called whenever deemed necessary in order to supply information necessary to prevent job interruptions, to observe the Work, or to inspect completed Work. The Contractor shall report weekly activities and problems and solutions. The Contractor shall be represented at each progress meeting by persons with full authority to act for the Contractor in regard to all portions of the Work. Meeting minutes shall be generated by the Professional and distributed to all attendees. The frequency of progress meetings may be reduced to once every other week at the discretion of

the Professional and Owner.

B. Comply with requirements stated in the CQC/CQA Plan.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 PURPOSE

A. To verify that products, systems, forms, and services proposed by the Contractor for use on this Project conform with the design intent. Contractor shall submit to the Professional project data, shop drawings, samples, certifications, schedules, manuals, and other submittals, as required in these specifications.

1.02 RESPONSIBILITY AND AUTHORITY

A. Neither the Owner's authority to review any of the Submittals by the Contractor, nor the Owner's decision to raise or not to raise any objections about the Submittals, creates or imposes any duty or responsibility on the Owner to exercise any such authority or decision for the benefit of the Contractor/Subcontractor/Supplier, any surety to any of them or any other third party. The Contractor is not relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals just because the Professional approved them.

1.04 SUBMITTAL CLASSIFICATION

Submittals are classified as Owner/Professional Approved (OA) or For Information Only (FIO).

1.05 PREPARATION OF SUBMITTALS BY CONTRACTOR

A. Review submittal items for legibility, conformance to the Contract Documents, coordination between work items, and completeness according to submittal requirements of each specification section. Certify review by signing transmittal form, and list Contractor's comments. The Contractor must give the Professional specific written notice of any variation from the requirements of the Contract Documents.

B. Provide the following information on the transmittal for each submittal:
1. Date of submittal
2. Project Name, Contract No., and Location
3. Submittal No., in sequence, beginning with 1
4. Contractor's name, address, and contact person
5. Items within submittal, numbered in sequence
6. Specification sections number
7. Manufacturer/Designer/Supplier
8. Special Instructions (when response is needed, if there is a deviance, etc.)
9. Signature certifying that the Contractor has reviewed the submittal (see Item A, above)

C. Cross-reference actual items in submittal by labeling them clearly by item number listed in

transmittal, and provide them in the sequence listed.

D. If all the submittal items required for the specification section are not provided or deviate from the Contract Documents, attach a memo explaining when the missing items will be provided.

E. Provide two copies of submittals to the Professional. If the Contractor anticipates review will require markup and return of the actual submittal, rather than providing comments via fax, then the Contractor shall provide an additional copy for markup and return to Contractor. A legible fax or email copy may be accepted to initiate review, if followed by hard copies.

1.06 SUBMITTAL REVIEW BY PROFESSIONAL

A. Upon receipt, Professional will log in submittals, and review for conformance with the design intent. Review is for general conformance with design concept for the project and general compliance with the information given in the Contract Documents.

B. Except for Information Only Submittals, where action and return is required, the Professional will review each submittal, mark to indicate action taken, and return within fifteen calendar days. Record reviews may require longer time when a multi disciplinary review is required. Professional will return submittal review forms and comments to the Contractor via fax or email. Professional will log out submittal upon sending comments to Contractor.

C. The Contractor is responsible for any time Delay and any cost incurred by the Professional, Contractor or Subcontractors/Suppliers as a result of resubmissions and re-reviews of a particular Submittal. The Contractor shall revise and correct submittals returned for revision and resubmittal until approval by the Professional is achieved.

D. Compliance with the Contract Documents is the Contractor's responsibility. Professional will review shop drawings solely for general conformance with design concept, and not for the purpose of reviewing or approving their accuracy, completeness, dimensions or quantities, constructability, performance, compatibility with other construction components, or their compliance with the requirements of the Contract Documents, such as Buy America requirements, all of which remain the responsibility of the Contractor. Professional's review also is not for the purpose of reviewing or approving the Contractor's safety precautions or construction means, methods, techniques, sequences or procedures.

E. The Professional will stamp each submittal with a uniform, action stamp. The Professional will mark the stamp appropriately to indicate the action taken, as follows:

1. Approved for General Conformance with Design Concept: When the Professional marks a submittal "Approved for General Conformance with Design Concept," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents.

2. Approved, As Noted, for General Conformance with Design Concept: When the Professional marks a submittal "Approved, As Noted, for General Conformance with Design Concept," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.

3. Revise and Resubmit: When the Professional marks a submittal "Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay.

   a. Do not use, or allow others to use, submittals marked "Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

4. Rejected: When the Professional marks a submittal "Rejected" do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Prepare a new submittal according to the notations; resubmit without delay.

   a. Do not use, or allow others to use, submittals marked "Rejected" at the Project Site or elsewhere where Work is in progress.

5. Not Subject to Review: Where a submittal is FIO or for information or record purposes or special processing or other activity, or otherwise does not require Professional review and approval, the Professional will return the submittal cover sheet marked "Not Subject to Review."

6. Requires Review and Approval by General Contractor: When a submittal does not indicate that it has been reviewed and approved by the General Contractor, the Professional will return the submittal marked "Requires Review and Approval by General Contractor." Do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity.

   a. Do not use, or allow others to use, submittals marked "Requires Review and Approval by General Contractor" at the Project Site or elsewhere where Work is in progress.

F. The approval of submittals by Professional shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing, and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error, which may exist. Neither the Professional's authority to review any of the Submittals by the Contractor, nor the Professional's decision to raise or not to raise any objections about the Submittals, creates or imposes any duty or responsibility on the Professional to exercise any such authority or decision for the benefit of the Contractor/Subcontractor/Supplier, any surety to any of them or any other third party. The Contractor is not relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals just because the Professional approved them.

G. Reservation of Rights - Professional reserves the right to require the Contractor to resubmit any item found not to comply with the Contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the Professional from requiring removal and replacement if nonconforming material is incorporated in the Work. This does not relieve the Contractor of the requirement to furnish samples for testing by Professional in those instances where the Contract Documents so prescribe. Additional time and expense necessary to comply with additional resubmittals required under this paragraph will not be the basis for any claims for time extension, delay, or extra cost on the part of the Contractor.

1.07 SCHEDULING

A. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with pertinent drawings shall be so scheduled.

B. The Contractor shall provide submittals to the Professional in a timely manner that allows for reasonable review cycles, and shall be consistent with the overall construction schedule.

C. No claims for schedule delays will be allowed for unresponsive submittals or failure to respond to comments in a timely manner by Contractor.

D. No work shall commence until all applicable Owner/Professional Approved submittals have been approved.

E. The schedule of values, project work plan, list of subcontractors, project schedule, health and safety plan (HASP), disposal facilities, and permits shall be submitted to the Professional within two weeks after Notice to Proceed. All other submittals shall be submitted as specified with each Section of the Contract Documents.

1.08 DELIVERY OF SUBMITTALS

A. The schedule of values, project work plan, list of subcontractors, project schedule, health and safety plan (HASP), disposal facilities, and permits shall be submitted to the Professional within two weeks after Notice of Award. All other submittals shall be submitted as specified with each Section of the Contract Documents.

1.09 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. Additional time and expense necessary to comply with additional resubmittals required under this paragraph will not be the basis for any claims for time extension, delay, or extra cost on the part of the Contractor.

1.10 LIST OF SUBMITTALS

Pre-construction submittals shall include, but are not limited, to the following. Submittal classifications and section references are also provided:

1. Pre-Work Photos of site: FIO;
2. Schedule of Values: OA; 01290
3. Project Work Plan: OA; 02000, 02110, 02240, 02315, 02950
4. Site Plan: OA; 02000
5. Project Schedule: OA; 02315
6. List of subcontractors: OA; 02315
7. HASP: FIO; 01400
8. Disposal facility and licenses: OA; 02120
9. Weigh scale certification: FIO; 02120, 02315, 02950
10. Permit Applications and Permits: FIO; 02110, 02120, 02220, 02370
11. Decontamination Plan: OA; 02120, 02130
12. Transportation route to disposal facility: OA; 02120
13. Spill Contingency Plan: OA; 02120
14. Dust Control and Air Monitoring Plan: OA; 01575
15. Soil Erosion and Sedimentation Control Plan: OA; 02370
16. Certification of Storm Water Operator, FIO; 02370
17. Backfill test results: OA; 01450, 02315
18. Backfill: OA; 02950
19. Gravel: OA; 02950
20. Pre-construction survey: FIO; 02950
21. The Construction Safety Phasing Plan (FAA Form 7460-1).
22. GCL Layout and Manufacturer Data: OA: 02117

Other submittals after starting construction shall include, but are not limited, to the following. Submittal classifications and section references are also provided:

1. Air Monitoring reports: FIO; 01575
2. Daily site activity reports, submitted weekly: FIO; 02315
3. Manifests and disposal tickets: OA; 02110, 02120, 02240, 02305
4. Weigh tickets: FIO; 02110, 02305
5. Waste characterization/analytical data: FIO; 01450, 02110, 02120, 02240, 02305, 02315
6. Backfill test results: OA; 01450, 02315
7. Backfill: OA; 02950
8. Gravel: OA; 02950
9. Pre- and post-construction survey: FIO; 02950
10. Notice of Substantial Completion: FIO; 01780
11. Notice of Final Completion: FIO; 01780

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01400

SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

This Section provides minimum guidance and implementation of a site safety and accident prevention program for the employees of the Contractor and for preparation of a Health and Safety Plan (HASP). The HASP shall be submitted to the Professional for information only. Approval shall not be required. The information and requirements identified in this section are the minimum requirements. The Contractor shall evaluate the work conditions and implement appropriate measures to protect the workers, environment, and general public.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-02	(1993) 1993-1994 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, or most recent revision

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1	(1990) Emergency Eyewash and Shower Equipment, or most recent revision

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR Part 1910	Occupational Safety and Health Standards
29 CFR Part 1910.120	Hazardous Waste Site Operations and Emergency Response
29 CFR Part 1926	Safety and Health Regulations for Construction
49 CFR Part 171	General Information, Regulations, and Definitions
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, or most recent revision

1.03 SUBMITTALS

The following submittals are required for information only. The Owner and Professional reserve the right to request for additional pertinent information.

A. Record of each entry into and exit from the site

B. Health and Safety Plan

C. Qualifications and experience of the Site Safety and Health Officer (SSHO), Safety Health Manager (SHM), and Competent Person for excavation work.

D. Name, phone number, and address of the individual responsible for responding to MIOSHA inquiries.

E. Proof of Employee Training: Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-Hour, annual 8-hour updates, and medical surveillance certification.

1.04 REGULATORY REQUIREMENTS

A. Work performed under this contract shall conform to all applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to, Occupational Safety and Health Administration (OSHA) standards, 29 CFR Part 1910, and 29 CFR Part 1926. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations and referenced documents vary, the most stringent requirements shall apply.

B. The Contractor is responsible for performing air monitoring and sampling as required. The Contractor shall contact the EGLE - Air Quality Division for guidance, if necessary.

C. The Contractor is responsible for selecting the proper personal protective equipment.

D. The Contractor is responsible for the proper disposal of all personal protective equipment. Disposal of personal protective equipment is incidental to the project.

E. The Contractor is responsible for providing proper training and applicable medical surveillance for all employees scheduled to perform Work at the site.

1.05 HEALTH AND SAFETY PLAN

A. Preparation and Implementation

A HASP shall be prepared covering onsite work to be performed by the Contractor and all subcontractors. The Safety and Health Manager shall be responsible for the development, implementation, and oversight of the HASP. The HASP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The HASP shall address site-specific safety and health requirements and procedures, based upon site-specific conditions. The level of detail provided in the HASP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial HASP is prepared and submitted. Therefore, the HASP shall address, in as much detail as possible, anticipated tasks, their related hazards, and anticipated control measures.

B. Availability

The HASP shall be made available in accordance with 29 CFR Part 1910, Section .120 (b)(1)(v) and 29 CFR Part 1926, Section .65 (b)(1)(v).

C. Elements

Topics required by 29 CFR Part 1910, Section .120 (b)(4) and in 29 CFR Part 1926, Section .65 (b)(4) shall be addressed in the HASP. Where the use of a specific topic is not applicable to the project, the HASP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic. The HASP should include, but is not limited to, the following sections:

1. Site description and contamination characterization
2. Hazard/risk analysis
3. Staff organization, qualifications, and responsibilities
4. Training
5. Personal protective equipment
6. Medical surveillance
7. Exposure monitoring/air sampling program
8. Heat and cold stress monitoring
9. Safety procedures, engineering, controls, and work practices
10. Site control measures
11. Personal hygiene and decontamination
12. Equipment decontamination
13. Emergency equipment and first aid requirements
14. Emergency response and contingency
15. Certificate of worker/visitor acknowledgment
16. Inspection
17. Safety and health phase-out report

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 TRAINING AND MEDICAL SURVEILLANCE

All workers shall have current OSHA 40-hour Hazardous Waste Operations and Emergency Response Training and medical surveillance as applicable per 29 CFR 1910.120.

3.02 FIRST AID AND EMERGENCY RESPONSE EQUIPMENT AND PROCEDURES

A. The Contractor shall provide for appropriate emergency first aid equipment (including ANSI-approved eyewash stations, a portable stretcher, and an industrial-type first aid kit) suitable for treatment of exposure to site physical and chemical hazards.

B. Additionally, two ABC rated fire extinguishers shall be maintained onsite, as well as absorbent material of sufficient quantity to collect any spill, which might occur during this project.

C. A listing of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts shall be posted at the site. A route map detailing the directions to the nearest hospital shall also be posted.

3.03 HEAT AND COLD STRESS

The Contractor shall monitor all personnel for signs of heat or cold stress, as dictated by weather conditions. In addition, all field personnel shall be instructed to observe the symptoms of heat or cold stress in themselves and fellow workers and methods to control them. The Contractor shall adhere to guidelines provided in the Threshold Limit Values and Biological Exposure Indices published by the ACGIH for heat and cold extremes.

3.04 ILLUMINATION

Work areas shall be illuminated to a minimum of 10 foot-candles. Lighting shall be sufficient to determine whether material spills have occurred.

3.05 ELECTRICAL SAFETY

All electrical services must be grounded and be equipped with and utilize ground fault circuit interrupter (GFCI) protected outlets. Portable lights used in the path of possible vapor travel shall be suitable for hazardous locations and shall be connected to extension cords equipped with connectors or switches approved for hazardous locations. Such equipment, when used, shall be thoroughly inspected to be sure it will not be a source of ignition. All air monitoring instrumentation shall be rated as intrinsically safe for CLASS I, DIVISION I, GROUP D atmospheres.

3.06 SITE CONTROL AND WORK ZONES

Personnel not directly involved with this project shall not be permitted to enter the Work Zone. For purposes of this Contract, the "Work Zone" shall encompass the area of the building and surrounding site property. The initial minimum level of personal protective equipment shall be in accordance with these Specifications. The boundary of the Work Zone shall be clearly demarcated and posted by the Contractor.

3.07 COMBUSTIBLE GAS/OXYGEN MONITORING

A. Any underground storage tanks found at the site shall be monitored for the presence of combustible vapors prior to commencement of project operations. Such monitoring shall be conducted both in the tanks as well as the areas surrounding the tanks, especially in excavations.

1. If combustible gas monitoring shows explosive levels within the tanks are less than 10% Lower Explosive Limit (LEL), those tanks may be removed and purged on the surface.
2. If readings are at or above 10% LEL, the tank shall be monitored and purged in the ground, as outlined elsewhere in these Specifications. Purging shall continue until monitoring shows readings below 10% LEL.
3. Any reading above 10% LEL outside the tanks shall result in the suspension of operations until the situation has been resolved and retesting indicates the space is "safe" (explosive levels less than 10% LEL).

B. Also, oxygen levels shall be monitored in trenches/excavations prior to allowing workers to enter, and continuously during the time the workers are present in these spaces. Any reading less than 19.5% or greater than 23% oxygen shall prevent the workers from entering until the situation is resolved and retesting indicates the space is safe for entry. Resolution of these hazardous situations may require forced ventilation of the space.

C. Any combustible gas/oxygen monitor, provided it complies with these Specifications, may be selected. The combustible gas indicator shall be calibrated, checked, and maintained daily, in accordance with manufacturer's directions.

3.08 AIR MONITORING AND SURVEILLANCE

When personnel are working on or near tanks or within trenches/excavations, the Contractor shall implement routine air surveillance and monitoring for LEL and oxygen levels. Air monitoring and surveillance shall be required whenever personnel enter a trench/excavation, every 15 minutes during tank decontamination, or whenever site conditions indicate that organic vapors may be present. Air monitoring, when conducted, shall be performed in the breathing zone of the personnel. Air monitoring and surveillance equipment shall be described in the Site Health and Safety Plan.

During soil handling/excavation/grading operations, the Contractor shall continually monitor volatile organic compounds (VOCs) immediately downwind of the work area and at the property

boundary downwind using 10.6 eV Photo Ionization Detector (PID). Contractor shall cover the exposed contaminated soils with 10-mil plastic sheeting overnight and weekends with any PID detections downwind of the excavation or as required by the Owner/Professional. Additionally, Contractor shall cover exposed soils with 10-mil plastic sheeting overnight and weekends if any objectionable odors (petroleum odors, landfill odors, etc.) are present.

3.09 ACTION LEVELS

Based upon the observation of site conditions, and published results of air monitoring and surveillance for combustible gas/oxygen/VOC monitoring for similar projects, the following action levels shall be implemented at a minimum:

A. Combustible Gas Monitoring

1. 0 to 10% LEL: Normal operations, continue monitoring
2. Greater than 10% LEL: Shut down operations and equipment; ventilate area

B. Oxygen Monitoring

1. 19.5% to 23% Oxygen: Normal operations, continue monitoring
2. Less than 19.5% oxygen: Shut down operations and ventilate area
3. Greater than 23% oxygen: Shut down operations and ventilate area

C. VOC Monitoring at the Work Area Downwind

1. 0 to 100 ppm VOCs: Normal operations, continue monitoring
2. Greater than 100 ppm: Modify operations and/or implement respiratory protection
3. Greater than 150 ppm: Shut down operations, ventilate area, cover the soils with 10-mil plastic sheeting.

D. VOC Monitoring at the Property Boundary Downwind

1. 0 to 5 ppm VOCs: Normal operations, continue monitoring
2. Greater than 5 ppm: Modify operations to reduce emissions
3. Greater than 10 ppm: Shut down operations, ventilate area, cover the soils with 10-mil plastic sheeting.

3.10 EXCAVATION SAFETY

All excavation work shall be conducted in strict conformance with, at a minimum, Sections 18 and 23 of EM 385-1-1 and 29 CFR 1926.650 through 29 CFR 1926.653, including requirements for sloping or shoring found in 29 CFR 1926.652. If the excavation must remain open during periods when the work site is unoccupied, barricades shall be placed around the excavation in such a manner to alert personnel to the danger and prevent them from falling into the trench.

3.11 EATING, DRINKING, SMOKING

No eating, drinking, smoking, chewing of tobacco or gum, or other hand-to-mouth activities shall be permitted in any of the work areas during the course of this project.

3.12 IGNITION SOURCES

A. No ignition sources (e.g., cigarette lighters, matches, or other flame producing items) not required for the completion of this project shall be permitted in the work zones.

B. Before any work is done that might release vapors, work areas shall be barricaded and posted, and burning or other work shall be eliminated from the area where flammable vapors may be present or may travel. Signs shall be posted warning that vehicles and other sources of ignition shall be kept out of the area.

C. No work shall be done if the direction of the wind might carry vapors into areas where they might produce a hazardous condition, nor when an electrical storm is threatening the site of work. Sparks caused by friction of electrostatic effects may also be a source of ignition in flammable atmospheres, especially at low humidity. Proper grounding of metal objects and/or electrical equipment, together with the use of sparkless tools and localized adjustment of humidity, may reduce this hazard.

3.13 HOT WORK

Absolutely NO hot work shall be permitted on or within the solid waste boundary until the Site Safety Officer has tested the atmosphere and declared the area “safe”.

3.14 BREAK AREA AND SUPPORT ACTIVITIES

All eating, drinking, smoking, and break facilities, as well as the Contractor’s equipment storage, parking, and office shall be located outside the Work Zones, as determined by the Site Safety Officer and approved by the Professional.

3.15 SANITATION

The Contractor shall ensure that all onsite personnel have ready access to soap and clean water, for washing before exiting contaminated areas, and to toilet facilities, as required by Section 3 of EM 385-1-1.

3.16 UNFORESEEN HAZARDS

Should any unforeseen or site-specific safety-related factor hazard, or condition become evident during the performance of work at this site, it shall be the Contractor’s responsibility to bring such conditions to the attention of the Professional, both verbally and in writing, as quickly as possible for resolution. In the interim, the Contractor shall take prudent action to establish and maintain working conditions and to safeguard employees, the public, and the environment.

END OF SECTION

SECTION 01410

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 REGULATORY REQUIREMENTS

The Contractor shall comply with all federal, state, and local rules, ordinances, and regulations; Code of Federal Regulations, MDOT, EGLE, Public Act 451; Building Codes, National Electric Codes, National Fire Protection Association; ASTM; County and local codes and ordinances, and all other applicable ordinances and regulations relating to employment, the preservation of public health and safety, and so forth.. All necessary permits or certifications of inspection shall be paid for and obtained by the Contractor.

A. **Laws:** The Contractor and its Subcontractors/Suppliers must comply with all Federal, State and local Laws applicable to the Work and site.

B. **Codes:** All Works must be provided in accordance with the State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seg,, International Building and Residential Codes and all applicable Michigan construction codes and fire safety including but not limited to: Michigan Building Code, Michigan Residential Code, Michigan Uniform Energy Code, Michigan Electrical Code, Michigan Rehabilitation Code for Existing Buildings, Michigan Mechanical Code, Michigan Elevator Code and Michigan Plumbing Code. If the Contractor observes that any Contract Document conflicts with any Laws or the State Construction Code or any permits in any respect, the Contractor must promptly notify the Professional in writing. If the Contractor provides any Work knowing or having to reason to know of such conflict, the Contractor must be responsible for that performance.

C. **Permits:** All required permits and authorizations must be secured and their fees including inspection costs must be paid by the Contractor to perform the Work. The time incurred by the Contractor in obtaining permits must constitute time required to complete the Work and does not justify any increases to the Contract Time or Price. The Contractor must pay all charges of Public Utilities for connections to the Work, unless otherwise provided by Cash Allowances specific to those connections. The Contractor shall comply with all permit and/or authorization requirements.

D. **Taxes:** The Contractor must pay all Michigan sales and use taxes and any other similar taxes covering the Work that are currently imposed by legislative enactment and as administered by the Michigan Department of Treasury, Revenue Division. If the Contractor is not required to pay or bear the burden or obtains a refund of any taxes deemed to have been included in the Bid and Contract Price, the Contract Price must be reduced by a like amount and that amount, whether as a refund or otherwise, must ensure solely to the benefit of the State of Michigan.

E. **Safety and Protection:** The Contractor and its Subcontractors/Suppliers must comply with all applicable Federal, State and local Laws governing the safety and protection of persons or property, including, but not limited to the Michigan Occupational Safety and Health Act

(MIOSHA), 1974 PA 154, as amended, MCL 408.1001 et seg., and all rules promulgated under the Act. The Contractor is responsible for all damages, injury or loss to the Work, materials, equipment, fines, penalties as a result of any violation of such Laws, except when it's due to the fault of the Drawings or Specifications or to the Act, error or omission of the Owner or Professional. The Contractor is solely responsible for initiating, maintaining and supervising all safety precautions and programs and such responsibility must continue until such time as the Professional is satisfied that the Work, or Work inspected, is completed and ready for final payment. In doing the Work and/or in the event of using explosives, the Contractor must take all necessary precautions for the safety of, and must erect and maintain all necessary safeguards and provide the necessary protection to prevent damage, injury or loss to: (a) all employees on the Work and other persons who may be affected by the Work, (b) all the Work and materials and equipment to be incorporated into the Work, whether stored on or off the site, and (c) other property at or adjacent to the site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Utilities not designated for removal, relocation or replacement. In the event of severe weather, the Contractor must inspect the Work and the site and take all reasonably necessary actions and precautions to protect the Work and ensure that public access and safety are maintained.

F. **Fire Hazard Conditions:** The fire hazard classification of finish materials where used in the specification must be in accordance with the current Michigan Building Code. Classification must be determined by tunnel test in accordance with National Fire Protection Association (NFPA-255), American Society for Testing Materials (ASTM E-84) or Underwriters' Laboratories, Inc. (UL-723).

G. **Flame/Smoke Resistance Standards**: The Contractor must provide carpeting complying with "Class B" requirements as set forth in Michigan Department of State Police State Fire Safety Board "Health Care Facilities Fire Safety Rules' R29.1243, Rule 243, when tested in accordance with the following procedures:

1. Tunnel Test: Test for surface burning characteristics, with ratings for flame spread, fuel contribution, and/or smoke density; ASTM E 84, UL 723, or NFPA No. 255.
2. Pill Test: Test for flammability; ASTM D 2859, or DOC FF-1-70.
3. Floor Radiant Panel Test: Test for burning under varying radiant energy levels; ASTM E 648, with minimum average radiant flux ratings not less than 0.45 watts/sq. cm.
4. Smoke Density Test: Test in radiant heat chamber, with and without flame, for density of smoke generated; ASTM E 662, or NFPA No. 258, also known as NBS Smoke Density Chamber Test

H. **Michigan Right-To-Know Law:** The Contractor and its Subcontractors/Suppliers must comply with MIOSHA, Michigan Right-to-Know Law (Public Act 80 of 1986) and the rules promulgated under it. The Act places certain requirements on employers to develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Material Safety Data Sheets (MSDS), and to provide training for employees who work with these chemicals and develop a written hazard communications program. The Act also provides for specific

employee rights, including the right to be notified of the location of MSDS and to be notified at the site of new or revised MSDS within five Business Days after receipt and to request MSDS copies from their employers. The Contractor, employer or Subcontractor must post and update these notices at the site.

I. **Environmental Requirements:** The Contractor and its Subcontractors/Suppliers must comply with all applicable Federal, State and local environmental Laws, standards, orders or requirements including but not limited to the National Environmental Policy Act of 1969, as amended, Michigan Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended, the Clean Air Act, as amended, the Clean Water Act, as amended, the Safe Drinking Water Act, as amended, Pollution Prevention Act, as amended, Resource Conservation and Recovery Act, as amended, National Historic Preservation Act, as amended and Energy Policy and Conservation Act and Energy Standards for Buildings Except Low-Rise Residential Buildings, ANSI/ASHRAE/IESNA Standard 90.1-1999.

J. **Nondiscrimination:** For all State Contracts for goods or services in amount of $5,000 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 and its Subcontractors and Suppliers must comply with the following requirements:

1. Not to discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex, height, weight or marital status and take affirmative action to ensure that applicants are employed and the employees are not subject to such discrimination. Such action must include, but is 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.
2. To state in all solicitations or advertisements for employees that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight or marital status.
3. To send, or have its collective bargaining representative send, each labor union or representative of workers with which there is a collective bargaining agreement or other contract or understanding, a notice advising the labor unions or workers' representative of the commitments under this provision.
4. To comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended , MCL 37.2201 et seq.; the Michigan Persons With Disability Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et Seq.; and all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission (MCRC) which may be in effect on or before the date of Bid opening.
5. The Contractor must furnish and file compliance reports within the times, and using the forms prescribed by the MCRC. Compliance report forms may also elicit information as to the practices, policies, programs, and employment statistics of the Contractor and Subcontractors. The Contractor must permit access to Records by the MCRC and its agent for purposes of ascertaining compliance with the Contract and with rules, regulations, and orders of the MCRC.
6. If, after a hearing held under its rules, the MCRC finds that the Contractor has not complied with the nondiscrimination requirements of the Contract Documents, MCRC may, as part of its order, certify its findings to the Administrative Board of

the State of Michigan, which may order the cancellation of the Contract and/or declare the Contractor ineligible for future contracts with the State until the Contractor complies with the MCRC's order.

K. **Michigan Residency for Employees:** Fifty percent of the persons employed on the Work by the Contractor must have been residents of the State of Michigan for not less than one year before beginning employment on the Work. This residency requirement may be reduced or waived to the extent that Michigan residents are not available or to the extent necessary to comply with the federal funds used for the Project. This requirement does not apply to employers who are signatories to collective bargaining agreements that allow for the portability of employees on an interstate basis.

1.02 REFERENCES

The following references are part of this specification to the extent referenced.

A. Federal Laws

1.	PL 94-850/98-616	Resource Conservation and Recovery Act (RCRA) of 1976, as amended 1984
2.	PL 91-596	Occupational Safety and Health Act (OSHA) of 1970

B. Code of Federal Regulations (CFR)

1.	29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
2.	29 CFR 1926	Safety and Health Regulations for Construction
3.	40 CFR 260	Hazardous Waste Management Systems, General
4.	40 CFR 261	Identification and Listing of Hazardous Wastes
5.	40 CFR 262	Standards Applicable to Generators of Hazardous Wastes
6.	40 CFR 263	Standards Applicable to Transporters of Hazardous Wastes
7.	40 CFR 264	Standards for Hazardous Wastes TSDF Owners and Operators
8.	40 CFR 265	Interim Standards for Hazardous Wastes TSDF Owners and Operators
9.	40 CFR 270	Hazardous Waste Permits Program
10.	49 CFR 172	Hazardous Materials
11.	49 CFR 173	General Shipment Requirements
12.	49 CFR 174-77	Transporter Requirements
13.	49 CFR 178-79	Container Specifications

C. State of Michigan Laws

1.	Part 201 of P.A. 451	Environmental Remediation
2.	Part 115 of P.A. 451	Solid Waste Management (formerly P.A. 641)
3.	Part 111 of P.A. 451	Hazardous Waste Management (formerly P.A. 64)
4.	Part 121 of P.A. 451	Liquid Industrial Waste
5.	P.A. 154	Michigan Occupational Safety and Health Act (MIOSHA)

D. Local Laws

1. Village, Township, City and County Ordinances

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01420

REFERENCES

PART 1 GENERAL

1.01 REFERENCES

References will be made in an abbreviated alpha numeric form to specific standard specifications, reference publications, and building codes of federal or state agencies, manufacturers, associations, or trade organizations. Such references will be identified by the alphabetic abbreviation which identifies the government agency, the association, or organization followed by the rule, section, or detail number that are to form a part of these specifications; the same as if fully set forth herein, and shall be of latest issued date in effect three months prior to the bid opening date shown on the Proposal and Contract. The abbreviations used are as follows:

Abbreviation	Agency, Association, or Organization
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, Michigan 48331
AISC	American Institute of Steel Construction, Inc. 1 E. Wacker Dr., Ste. 700 Chicago, Illinois 60601-1802
AMCA	Air Movement and Control Association 30 W. University Dr. Arlington Heights, Illinois 60004
ANSI	American National Standards Institute, Inc. 1819 L St., NW, 6th Fl. Washington D.C. 20036
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers 1791 Tullie Cir., NE Atlanta, Georgia 30329
ASME	American Society of Mechanical Engineers 3 Park Ave. New York, New York 10016-5990
ASSE	American Society of Sanitary Engineering 1800 E. Oakton St. Des Plaines, IL 60018
ASTM	American Society for Testing and Materials 100 Barr Harbor Dr.

	P.O. Box C700 West Conshohocken, Pennsylvania 19428-2959
AWS	American Welding Society 550 NW LeJeune Rd. Miami, Florida 33126
AWWA	American Water Works Association 6666 W. Quincy Ave. Denver, Colorado 80235
BOCA	Building Officials and Code Administrators, International 4051 W. Flossmooor Rd. Country Club Hills, Illinois 60478-5795
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, Illinois 60173-4758
MDOT	Michigan Department of Transportation State Transportation Building 425 W. Ottawa St. P.O. Box 30050 Lansing, Michigan 48909
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, Massachusetts 02169-7491
NIST	National Institute of Standards and Technology 100 Bureau Dr., Stop 1070 Gaithersburg, Maryland 20899-1070
NSF	National Sanitation Foundation (NSF) International 789 N. Dixboro Rd. P.O. Box 130140 Ann Arbor, Michigan 48113-0140
NSWMA	National Solid Waste Management Association 4301 Connecticut Ave., NW, Suite 300 Washington, D.C. 20008-2304
PCA	Portland Cement Association 5420 Old Orchard Rd. Skokie, Illinois 60077
PDI	Plumbing and Drainage Institute 800 Turnpike St., Ste. 300 North Andover, Massachusetts 01845

UL	Underwriters Laboratories, Inc. 333 Pfingsten Rd. Northbrook, Illinois 60062-2096
USDC	United States Department of Commerce 1401 Constitution Ave., NW Washington, D.C. 20230

1.02 The following organizations may also be referred to in these Plans and Specifications by the abbreviations of their titles. Additional information noted, but not detailed, can be obtained from these organizations.

Abbreviation	Agency, Association or Organization
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction, Inc.
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BOCA	Building Officials and Code
CDA	Copper Development Assn., Inc.
CLFMI	Chain Link Fence Manufacturer's Institute
CISPI	Cast Iron Soil Pipe Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
FAA	Federal Aviation Administration
F/M	Factory Mutual Research Corporation
FS	Federal Specifications
HEW	United States Department of Health Education and Welfare
MDOT	Michigan Department of Transportation
MIOSHA	Michigan Occupational Safety and Health Administration
NEC	National Electric Code
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation Testing Laboratory, Inc
NSWMA	National Solid Waste Management Association
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
SMACNA	Sheet Metal & Air Conditioning Contractors
UL	Underwriters Laboratories, Inc.
USBM	United States Bureau of Mines
USDC	United States Department of Commerce

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.01 PURPOSE

Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.02 TESTING AND INSPECTIONS SERVICES

A. Any sampling and analytical services that are required during the construction activities in order to conform to Health and Safety requirements, shall be provided by the Contractor at no extra cost to the Owner or Professional.

B. The Professional shall provide the following services:

1. Observe onsite progress
2. Verify quantity measurements for payment
3. Photograph construction progression
4. Observe that project has been completed according to the design and specification (Construction Quality Assurance)
5. Evaluate data received from Contractor's testing laboratory
6. Conduct verification sampling, as appropriate and/or if necessary
7. Identify soils/refuse as potentially hazardous
8. Verification sampling, if necessary

C. The Contractor's services shall be performed in accordance with requirements of governing authorities and with specified standards. The Contractor's services shall be performed in accordance with the "CQC/CQA Plan for Flint Bishop Airport Landfill Cover (Cap)".

D. Testing Laboratory Services: All required tests shall fulfill ASTM, ANSI, Commercial, and other Standards for testing. Submit a minimum of two copies of each test report to the Professional for evaluation and subsequent distribution. The test report shall include observations, test results, and indication of compliance or non-compliance with specified standards and Contract Documents. The following general classifications of Work require submission of test reports and/or Certificates of Compliance to the Professional. Additional submissions may be requested by the Professional at any time.

Item of Work	Test Type	Section Number
Handling of Hazardous Materials	Universal Wastes testing	02110
Excavation and Fill	Compaction and Density	02315
Excavation and Fill	Grain Size Analysis	02315
Excavation and Fill	Modified Proctor Test	02315

Excavation and Fill	Backfill Analytical Results	02315
Offsite Transportation and Disposal	Soil/Liquid Analytical Results	02120

E. Contractor shall cooperate with the Professional and furnish tools, samples of materials, equipment, storage, and assistance, as requested.

F. The Contractor shall notify the Professional a minimum 48 hours prior to expected time for operations requiring testing services or requiring the Professional's presence at the site for coordinating certain activities.

1.03 FIELD ENGINEERING

A. When applicable, the Contractor must employ a surveyor who must establish and maintain all lines and levels required for laying out and constructing the Work. The Contractor agrees to assume all responsibility due to inaccuracy of any Work of the surveyor, and including incorrect bench marks, their loss or disturbance. Upon completion of the Project, if applicable, the Contractor must submit two copies of site layout Drawings prepared for the Project and certified by the surveyor.

B. The Contractor's services shall be performed in accordance with the "CQA/CQC Plan for Flint Bishop Airport Landfill Cover (Cap)".

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

Upon completion of inspection, testing, sampling, and similar services performed on the Work, the Contractor shall repair damaged Work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finishes. The Contractor shall protect Work exposed by or for quality control service activities, and protect repaired Work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01510

TEMPORARY FACILITIES/UTILITIES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall furnish and install all temporary facilities, utilities, and controls required by the Work, shall remove them from the property upon completion of the Work, and the grounds and existing structures shall be restored to their original condition. Temporary utilities may include, but not limited to, electricity, lighting, ventilation, and water.

B. Facilities include, but not limited to (Refer to Section 01520):

a. Contractor's office and storage facilities.
b. Sanitary facilities conforming to local codes and OSHA requirements.
c. Soil storage/staging area.
d. Equipment decontamination facility.
e. Truck washing pad/area.

C. The Contractor shall pay for cost of installation and removal of any temporary connections, including necessary safety devices and controls.

1.02 TEMPORARY ELECTRICITY

The Contractor shall provide electrical service required for construction operations.

1.03 TEMPORARY LIGHTING

The Contractor shall provide and maintain lighting for construction operations to achieve a minimum illumination of 10 foot-candles.

1.04 TEMPORARY WATER SERVICE

The Contractor shall provide, maintain, and pay for suitable quality water service required for construction operations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01520

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

The Contractor shall provide and install construction facilities which include, but not limited to, temporary storage facilities, sanitary facilities, office trailer, and signs. All costs associated with this Section are incidental to the project.

1.02 STORAGE FACILITIES

A. At the beginning of the Work, the Contractor shall provide a temporary field office and temporary storage building at the site in a location acceptable to the Owner. The building may be a trailer. The Contractor may provide such other temporary buildings as he may require for the use of workers and safe storage for tools and materials.

B. The Contractor shall be responsible for providing and maintaining storage facilities for decontamination water, storm water, and other water generated and/or collected onsite during the work, and other project related materials and items.

1.03 SANITARY FACILITIES AND TEMPORARY OFFICE

A. The Contractor must provide and maintain a sufficient number of portable temporary toilets in locations approved by the Owner. They must comply with all Federal, State and local code requirements. The Contractor must maintain the temporary toilets in a sanitary condition at all times and must remove them when the Work under this Contract is complete.

B. The Contractor is responsible for all fees associated with providing and maintaining all office, storage and sanitary facilities on a regular basis, and removal of facilities upon construction completion.

C. The Contractor shall provide an onsite office (trailer) with heating, cooling, and electricity. The Office shall also have a conference area capable of seating 10 people. The office shall provide a desk and seat for the Professional's onsite observer.

1.04 PROJECT SIGNING

A. Bulletin Board

Immediately upon the beginning of work, the Contractor shall provide a weatherproof plexi-glass covered bulletin board not less than 915 mm by 1220 mm (36 in. by 48 in.) in size for displaying the Equal Employment Opportunity poster and other information approved by the Professional. The bulletin board shall be located at the project site in a conspicuous

place easily accessible to all employees as approved by the Professional. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

B. Project and Safety Signs

All project and safety signs shall be erected prior to commencement of the work. The data required by the safety sign shall be corrected daily, with light colored metallic or non-metallic numerals. Upon completion of the project, the signs shall be removed from the site.

1.05 MATERIAL AND EQUIPMENT

A. The Contractor must furnish and be responsible for all materials, equipment, facilities, tools, supplies and utilities necessary for completing the Work. All materials and equipment must be provided as described in the Contract Documents and of good quality, free of defect and new and must be applied, installed, connected, erected, used, cleaned and conditioned following the manufacturer's and Suppliers' instructions.

B. All materials and equipment delivered to and used in the Work must be suitably stored and protected from the elements. The areas used for storage must only be those approved by the State Agency. The Owner assumes no responsibility for stored material. The ownership and title to materials will not be vested in the Owner before materials are incorporated in the Work, unless payment is made by the Owner for stored materials and equipment. After delivery, before and after installation, the Contractor must protect materials and equipment against theft, injury or damage from all causes. For all materials and equipment, the Contractor must provide complete information on installation, operation and preventive maintenance.

(a) The Contractor must cover and protect bulk materials while in storage which are subject to deterioration because of dampness, the weather or contamination. The Contractor must keep materials in their original sealed containers, unopened, with labels plainly indicating manufacturer's name, brand, type and grade of material and must immediately remove from the Work site containers which are broken, opened, watermarked and/or contain caked, lumpy or otherwise damaged materials.

(b) The Contractor must keep equipment stored outdoors from contact with the ground, away from areas subject to flooding and covered with weatherproof plastic sheeting or tarpaulins.

(c) The Contractor must certify that any materials stored off-site are:

a) Stored on property owned or leased by the Contractor or owned by the agency.
b) Insured against loss by fire, theft, flood or other hazards.
c) Properly stored and protected against loss or damage.

d) In compliance with the plans and specifications.
e) Specifically allotted, identified, and reserved for the project.
f) Itemized for tracking and payment.
g) Subject to these conditions until the items are delivered to the project site.

PART 2 PRODUCTS

2.01 MATERIALS

A. Personnel safety equipment shall be furnished in compliance with federal and state requirements, including OSHA.

B. Equipment decontamination facility shall be located such that any equipment leaving the exclusion zone shall be decontaminated prior to leaving the site.

C. Prior to commencement of site activities, the Contractor shall submit a plan to the Professional for approval on the methods and materials to be used for the decontamination of vehicles leaving the site.

D. The Contractor shall provide sufficient drinking water and sanitation facilities for all employees and site visitors.

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01540

CONSTRUCTION AIDS

PART 1 GENERAL

1.01 CONSTRUCTION AIDS

A. 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, shoring, engineering supports, etc., as required for proper execution of the Work. All construction aids shall conform to federal, state, and local codes and laws for protection of workers and the public.

B. The Contractor must erect and maintain all street barricades, signal lights and lane change markers during the periods that a traffic lane is closed for their operations. There must be full compliance with rules and ordinances respecting such street barricading and devices must be removed when hazard is no longer present. Contractor shall obtain appropriate permits and authorizations from the State and/or local agencies.

C. The Contractor shall construct and maintain any necessary surface drainage systems on the Work site so as to prevent storm water from entering drains/storm-sewers/creeks, any excavations or refuse, and flowing onto public or private property adjacent to the Owner's land. The Contractor shall prevent erosion of soils and blockage of any existing drainage system.

D. The related costs for construction aids specified in this Section are incidental to the project.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01550

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 ACCESS ROADS AND PARKING

A. Prior to commencing work, the Contractor will be responsible for either videotaping or photographing the existing roads, bridges/culverts, curbs, parking areas, fences, and structures to record the existing conditions. Any damage caused by the Contractor's work activities shall be repaired by the Contractor at no cost to the Owner.

B. The Contractor shall construct temporary access roads and parking areas necessary for proper execution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. Temporary roads and parking areas shall be designed and maintained by the Contractor, so as to be fully usable in all weather conditions.

C. Contractor employee parking shall not interfere with the progress of work. Vehicles leaving the construction site that become contaminated while within the construction site shall be decontaminated prior to leaving the site. Vehicles specified by the Professional shall be decontaminated and shall not leave the site without authorization of the Professional.

D. Temporary access roads and parking areas shall be removed by the Contractor prior to final acceptance, unless otherwise required by the Contract Documents.

E. All costs associated with this Section are incidental to the project.

1.02 MAINTENANCE OF CONSTRUCTION AREA

A. Construction fencing shall be kept in a state of good repair and proper alignment.

B. Should the Contractor elect to traverse grassed or unpaved areas which are not established roadways with construction equipment or other vehicles, such areas shall be covered with a layer of gravel or equipment mats, as necessary, to prevent rutting and the tracking of mud onto paved or established roadways. Gravel gradation shall be at the Contractor's discretion.

C. All costs associated with this Section are incidental to the project.

1.03 PROTECTION AND MAINTENANCE OF TRAFFIC

A. Contractor shall maintain and protect traffic on all affected roads throughout the construction period, in accordance with local and MDOT ordinances and requirements. If the Work requires roads to be temporarily shutdown, traffic stopped or detoured, the Contractor shall make arrangements with local and MDOT authorities for permits,

permission and proper procedures and required protective measures. Measures for the protection and diversion of traffic include, but are not limited to, the following:

1. Provision of watchman and flagmen
2. Erection of barricades
3. Placement of lights around and in front of equipment and the work
4. Erection and maintenance of adequate warning signs such as danger and direction signs
5. Erection of Slow Moving Trucks Entering Highway or any other signs as required

The aforementioned and any other measures shall be as required by the State, and local authorities having jurisdiction at the site and for the trucking route.

B. The traveling public shall be protected from damage to person and property. Contractor shall obtain permits, place barricades, install fencing, provide flag persons, and provide necessary provisions to ensure the safety of traveling public adjacent to the site during demolition work.

C. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations. The Contractor shall minimize public road impacts from construction operations.

D. No mud tracking or mud matting will be allowed on any public street. Contractor shall arrange for and supply a street-sweeper/cleaner to maintain the public roads on an ongoing basis. The cleaning operation shall be conducted as required and determined by the Professional, and at a minimum as required by the agency having jurisdiction over the roadways.

E. Any required sidewalk and lane closures or work in the public rights-of-way shall be approved by the State, County, City, Michigan Department of Transportation, and/or any other authorities having jurisdiction. Contractor is responsible for obtaining required permits for work within the public rights-of-way.

F. All costs associated with this Section are incidental to the project.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01560

TEMPORARY BARRIERS AND ENCLOSURES

PART 1 GENERAL

1.01 BARRIER AND ENCLOSURES

A. The Contractor shall furnish, install, and maintain, as long as necessary, adequate barriers, warning signs, or lights at all dangerous points throughout the Work for protection of property, workers, and the public. The Contractor shall remove such material when deemed no longer required. The Contractor shall hold the Owner and Professional harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the Work under the Contract.

B. Temporary Fence: The Contractor shall install a temporary fence enclosing the work area, as noted on details in the Appendices and Drawings. A wildlife deterrent fence skirt shall be installed as noted in the Appendices. The Contractor shall install a small 4' tall temporary portable fence enclosing any trench or excavation areas within the work area. Gates shall be provided at all points of access. Gates shall be closed and secured in place at all times when Work under the Contract is not in progress including nights and weekends, and during days when Contractor personnel are not on-site. Contractor shall entirely enclose all excavations/trenches to be open overnight as required by OSHA and property owner regulations. The temporary fence shall be removed and grounds restored to original condition upon completion of the Work. Fence details are located in Appendix VII.

C. Barricades: The Contractor shall erect and maintain temporary barricades to limit public access to the construction areas. Such barricades shall be required whenever safe public access to paved areas such as roads, driveways, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed and clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

D. Street Barricades: The Contractor shall erect and maintain all street barricades, signal lights, and lane change markers, and signage during periods that traffic lanes are closed for operations, if traffic may be affected by onsite work, and/or to protect vehicular and pedestrian traffic. There shall be full compliance with rules and ordinances regarding street barricading, and the devices shall be removed when the hazard is no longer present. All street barricades shall meet the requirements of the Michigan Department of Transportation (MDOT), State of Michigan, and local governing authority for work in the rights-of-way. The Contractor shall be responsible for obtaining all necessary right-of-way permits and pay for associated costs.

E. Traffic Control Devices: The Contractor Shall erect, maintain, and remove when completed all traffic control devices as required by the Traffic Control Plan prepared by the Contractor and approved by the governing authority. All traffic control devices shall meet the

requirements of MDOT, County, City, and local governing authority. The Contractor shall obtain necessary permits and meet all permit requirements.

F. Traffic Control Devices: The Contractor Shall erect, maintain, and remove when completed all traffic control devices as required by the Traffic Control Plan prepared by the Contractor and approved by the governing authority. All traffic control devices shall meet the requirements of MDOT, County, City, and local governing authority. The Contractor shall obtain necessary permits and meet all permit requirements.

G. All costs associated with temporary barriers and enclosures are incidental to the project.

1.02 SECURITY PROVISIONS

The Contractor shall be responsible for the security of its own equipment and material. In addition, the Contractor may notify the appropriate law enforcement agency requesting periodic security checks of the Work area. Other security items, such as lighting, shall be the responsibility of the Contractor, including all fees.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01575

DUST CONTROL AND AIR MONITORING

PART 1 GENERAL

1.01 DESCRIPTION

The Contractor shall provide necessary engineering controls to prevent dust emission and offsite migration of airborne materials. Air monitoring shall be performed to ensure that airborne dust levels do not exceed established regulatory limits. All costs associated with dust control and air monitoring are incidental to the project.

1.02 SUBMITTALS

A. Dust Control and Air Monitoring Plan

Prior to proceeding with the soil excavation, removal, and disposal work, the Contractor shall submit, in accordance with Section 01330-Submittal Procedures and as part of the Project Work Plan, a dust control and air monitoring plan to the Professional for approval.

At a minimum the Dust Control and Air Monitoring Plan shall include:

1. The means, methods, and procedures used to control airborne emissions and to avoid potential dust migration offsite.

2. The equipment, sampling procedures, and sampling locations to be used for dust monitoring.

3. Wet-sweeping of public roads, as necessary, to control dust resulting from onsite activities.

B. Monitoring Reports

The Contractor shall submit daily air monitoring reports to the Professional for review at the end of every workday of excavation and associated operations. The monitoring reports shall include real-time air monitoring data.

1.03 QUALITY CONTROL

A. Work Area

1. The Contractor shall maintain and control airborne dust below 10 mg/m^3 in the work area, during soil excavation/grading and associated activities.

2. Provide regular and adequate moisture during operations to prevent dust emissions and migration.

3. Use air monitoring that will adequately demonstrate that dust emission in the work area is below 10 mg/m^3 during activities.

4. Contractor shall continually monitor volatile organic compounds (VOCs) immediately downwind of the work area and at the property boundary downwind using 10.6 eV Photo Ionization Detector (PID). Refer to Section 01400 for additional detail.

5. Refer to the CQC/CQA Plan for additional requirements.

B. Site Perimeter

1. The Contractor shall maintain and control airborne dust below 150 ug/m^3 at the site perimeter, during soil excavation and associated activities.

2. Provide regular and adequate moisture during operations to prevent dust emissions and migration.

3. Use air monitoring that will adequately demonstrate that dust emission at the site perimeter is below 150 ug/m^3 during activities.

4. Refer to the CQC/CQA Plan for additional requirements.

PART 2 PRODUCTS

2.01 MONITORING INSTRUMENT

Instrumentation that adequately demonstrates compliance, such as real-time aerosol monitors/data logger.

PART 3 EXECUTION

3.01 AIR MONITORING

A. The Contractor shall have a minimum of three real-time aerosol monitors at the work area to monitor air quality during excavation and grading operations. One real-time monitor shall be placed upwind of the excavation area and two aerosol monitors shall be placed downwind of the excavation area. One downwind monitoring station shall be adjacent to the work area, and the other downwind monitoring shall be located at the site perimeter. The location placement of the aerosol monitors shall be approved by the Professional on daily basis prior to start of grading, excavation, and related activities.

B. The Contractor shall closely monitor dust levels at the project site during grading/excavation and associated operations. At no time may the concentration of aerosol dust resulting from the Contractor's activity exceed 10 mg/m^3 in the work area or 150 ug/ m^3 at the site perimeter for more than 5 minutes during construction. If the level of

dust exceeds these limits for more than 5 minutes at any one real-time aerosol monitoring location, operations shall be immediately suspended. Additional dust control measures shall be taken to reduce the airborne dust generated from the Contractor operation. Contractor shall not resume the demolition/excavation activity until the level of dust drops below 10 mg/m^3 in the work zone and 150 ug/ m^3 at the site perimeter for a minimum of 10 minutes.

C. Refer to Section 01400 for additional detail on VOC air monitoring.

D. Refer to the CQC/CQA Plan for additional requirements.

3.02 DUST CONTROL

A. The Contractor shall employ adequate engineering controls and misting operations, so as to prevent visible emissions of dust and migration of airborne materials offsite. Water sprayers may be used to prevent fugitive dust emission during the grading operations. The Contractor shall coordinate with property owner and/or local municipality for water availability and pay for the use of the water. The Contractor shall pay costs for installation and removal of any temporary connections including necessary safety devices and controls. Use of water shall not result in or create hazardous or objectionable conditions. Use of water will not be permitted when it will result in or create hazardous or objectionable conditions such as ice, flooding, runoff to receiving surface water bodies (i.e., drains/creeks/storm sewers), pollution, or electrical shock.

B. Excavated refuse may be temporarily stockpiled on a plastic liner (10-mil minimum thickness). The plastic liner shall have a minimum 3-foot wide soil-free perimeter around the stockpiles. The stockpile shall also be completely covered with a double layer of the plastic anchored securely to protect against wind and precipitation. Stockpiles shall be sloped to minimize creeping or sloughing of the soils, and the Contractor shall clearly mark contaminated and uncontaminated stockpiles. Diking or other measures shall be used to prevent surface runoff from flowing onto the liners on which the soil is placed. Where several sheets of plastic are necessary to cover the stockpiles, the edges shall be taped and shall overlap a minimum of 2 feet. Once the stockpile has been covered, the soil-free perimeter of the liner shall be secured with concrete blocks. The Contractor, under the direction of the Professional, shall daily inspect the liners and covers for defects and damage. Should any tears, defects, or other damages be found, the Contractor shall replace or repair the damaged plastic sheets, at no additional cost to the Owner or Professional.

B. To prevent track-out of contaminated materials and uncontaminated soil that may result in a dust problem, when necessary, vehicles shall be thoroughly decontaminated and washed prior to leaving the site. If there is significant track out of dust onto adjacent public roadways, the Contractor shall provide and operate a wet-sweeper at a frequency necessary to prevent dust problems. When contaminated material is transported offsite, all loads shall be properly covered prior to leaving the site to minimize loss from the trucks.

C. Refer to the CQC/CQA Plan for additional requirements.

3.03 DATA REPORTING

The Contractor shall submit a hard copy of the continuous real-time aerosol monitoring data to the Professional for inspection at the end of each workday.

END OF SECTION

SECTION 01740

CLEANING

PART 1 GENERAL

1.01 CLEANING

A. Regular Cleaning: Contractor shall remove all scrap or removed material, debris, or rubbish from the project at the end of each workday and more frequently whenever the Professional deems such material to be a hazard. No discarded material shall be deposited on the grounds. No salvage or surplus material may be sold on the premises. The Contractor shall take appropriate efforts so as not to create any nuisance conditions at or around the property. Contractor shall promptly clean areas dirtied by any cause arising from its operations. Contractor shall maintain good housekeeping practices, and comply with local permits and ordinances.

B. Final Cleaning: Just prior to final acceptance by the Owner and Professional, the Contractor shall clean all of the Work and existing surfaces, building elements and contents that were soiled by the operations and make repairs for any damage or blemish that was caused by the Work.

C. The Contractor is responsible for wet sweeping of streets on a regular basis, as required by Owner, MDOT or local government, and just prior to final acceptance by the Owner and Professional to control the dust or mud tracking.

D. All related costs associated with site cleaning are incidental to the project.

1.02 CLEANUP

A. All construction debris and waste materials generated by the Contractor shall be removed from the work site daily. Any dirt or debris tracked onto paved or surfaced roadways shall be cleaned away. Salvageable uncontaminated or decontaminated materials resulting from removal activities may be stored at the site with approval of the Owner. Materials not stored in trailers, whether new or salvaged, shall be neatly stacked when stored. The related costs are incidental to project.

B. All construction debris, waste materials, rubbish, and excess and/or unsatisfactory materials resulting from the Work and generated onsite shall be completely removed from the site and properly disposed of, unless otherwise specified or directed by the Professional.

C. All related costs associated with site cleanup are incidental to the project.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01780

CONTRACT CLOSE OUT

PART 1 GENERAL

Division 0 supersedes any of the provisions presented in this section.

1.01 DESCRIPTION

A. This Section provides the requirements for final closeout of the project, including final review of work, final adjustments of accounts, and as-built drawing review.

B. Substantial Completion shall be defined as the completion of all Contract Items, with the exception of demobilization.

C. A Substantial Completion Inspection of the site shall be conducted by the Owner and Professional with the Contractor. Deficiencies identified during the inspection, provided to the Contractor as punch list items, shall be rectified at no added expense to the Owner.

D. A Project Closeout Meeting shall be conducted by the Professional, with the Contractor and the Owner, at the end of the work upon completion of punch list items identified in the substantial completion meeting.

1.02 REFERENCES

The following publication forms a part of this specification to the extent referenced. This publication is referred to in the text by its basic designation only.

AMERICAN INSTITUTE OF ARCHETECTS (AIA)

G702, G703 Application and Certification for Payment Form

1.03 SUBMITTALS

A. The Contractor shall provide written notification to the Professional when the project is substantially complete.

B. Upon verification of Substantial Completion by the Owner and Professional, the Contractor shall sign a Certificate of Substantial Completion for the Contract Work (Form: DMB-445). This form must be dated to reflect the actual date of Substantial Completion.

C. The Contractor shall provide written notification to the Professional when the project is complete in accordance with contract documents and is ready for final review.

D. If the project is bonded, the Contractor shall provide consent to make final payment from the bonding company with power of attorney.

E. The Contractor shall submit a final statement of accounting for all contract quantities to the Professional.

F. The Contractor shall submit a Final Application for Payment to the Professional, as detailed in Subsection 3.05 Final Application for Payment.

G. The Contractor shall submit, to the Professional, a completed Guarantee and Statement form (DMB-437) with the Final Application for Payment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SUBSTANTIAL COMPLETION

A. The Contractor must notify the Professional that the project is substantially complete.

B. The Professional will schedule the Substantial Completion Inspection upon receipt of notification from the Contractor. The Contractor must be represented on the job site at the time this inspection is made.

C. Upon inspection, should the Owner and Professional consider the work substantially complete:

1. The Professional shall prepare and provide to the Contractor, a punch list of minor items to be completed or corrected, as determined by the inspection.

2. The Professional will complete and sign a Certificate of Substantial Completion of Contract Work and provide it to the Contractor for signature. This form shall include the Contractor's punch list, as amended by the Professional.

3. The Contractor shall complete the work listed for completion or correction within seven calendar days or as otherwise agreeable to the Owner and Professional.

4. Two hundred percent (200%) of the value of all punch list items will be withheld from payment and will be paid to the Contractor upon final completion, as part of the Final Application for Payment.

D. Upon inspection, should the Owner and Professional consider the work not substantially complete:

1. The Professional shall notify the Contractor immediately, in writing, identifying the work is not substantially complete.

2. The Contractor shall then complete the work, and send a new written notice to the Professional certifying that the project is substantially complete.

3. The Owner and Professional will again review the work to verify if it is substantially complete.

3.02 FINAL REVIEW

A. The Contractor must notify the Professional that the Work has been completed in accordance with Contract Documents, and the project is ready for final review.

B. The Owner and/or Professional shall conduct a final review and provide any comments to the Contractor within seven calendar days after performance of the final review.

C. Should the Owner and Professional consider that the work is finally complete in accordance with the requirements of Contract Documents, the Professional will request that the Contractor submit the project closeout documents to Professional.

D. Should the Owner and Professional consider that the work is not finally complete:

1. The Professional will notify Contractor, in writing, identifying what work is not finally complete.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a new written notice to the Professional certifying that the work is complete. The Owner and/or Professional will again review the work for final completion.

3.03 CLOSE OUT SUBMITTALS

The Contractor shall submit completion notifications, guarantees and statements, other warranties, Consent of Surety, all manifests and weight tickets not previously submitted, laboratory analytical data, compaction testing results, air monitoring report not previously submitted, as-built drawings, etc. to the Professional.

3.04 FINAL ADJUSTMENTS OF ACCOUNT

A. Submit final statement of accounting for all contract quantities to the Professional.

B. Statement shall reflect all adjustments, including:

1. Original Contract Sum
2. Additions and deductions resulting from:
   a. Previous Contract Change Orders
   b. Cash Allowances
   c. Work not performed and other adjustments
   d. Deductions for uncorrected work
   e. Deductions for liquidated damages

3. Total Contract Sum, as adjusted
4. Previous payments
5. Sum due to the Contractor

C. The Professional will process a final Change Order Request, reflecting approved adjustments to Contract Sum not made previously by Change Orders.

3.05 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the following to the Professional as final application for payment:

1. Written notification that the project is complete

2. Application and Certification for Payment form (AIA Documents G702 and G703, or equivalent)

3. Consent of Surety to final payment with power of attorney

4. Guarantee and Statement (Form DMB-437) from Contractor guaranteeing site work for one year from the date of Substantial Completion, for all work completed through Substantial Completion. A separate one-year guarantee period maybe established for seeding, depending on the completion date of associated activities.

5. Certificate of Substantial Completion (Form DMB-445) of Contract Work form. This form must be dated to reflect actual date of substantial completion and signed by an authorized representative of the Contractor.

B. Upon receipt of application for final payment, the Professional will review the application to determine if the project is substantially complete. If so determined, within seven calendar days, the Professional will recommend final payment by the Owner or provide the Contractor with written notice stating why the request was not recommended for payment.

END OF SECTION

SECTION 01785

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 DESCRIPTION

The Contractor shall keep accurate record documents for all additions, substitution of material, variations in work, and any other revisions to the Contract Documents.

1.02 MAINTENANCE OF DOCUMENTS

A. The Contractor shall maintain at job site, one copy of:

1. Site-Specific Health and Safety Plan
2. Project Work Plan
3. Permits
4. Record drawings showing progress of work
5. Specifications
6. Addenda
7. Contract Change Orders
8. Other modifications to Contract
9. Field test records
10. Scale certification documentation
11. Contractor's daily progress or activity reports, including:

a. Records of all site work
b. Daily payment quantities
c. Manifest documents and variance reports
d. Inspection records for staging and storage
e. Reports on any emergency response actions
f. All laboratory and analytical results
g. Wage records as required for Federal/State funded projects
h. Dust control and air monitoring reports
i. Photographs and negatives
j. Chain-of-Custody forms
k. Shipping documents
l. Accident reports
m. Spill reports

B. The Contractor shall provide files and racks for storage of documents. Documents shall be stored in a dry, safe place, apart from construction documents; and be available for inspection by the Professional or Owner.

C. The record documents shall not be used for construction purposes.

D. The Contractor shall submit all Project Record Documents prior to submittal of the Application for Final Payment. The Contractor will not receive final payment until the Project Record Documents are received.

1.03 SUBMITTALS

A. At the completion of field operations, the Contractor shall deliver record documents to the Professional, including consolidation and summary of the analytical quality control results in final report format and record drawings.

B. Project record documents shall include all items specified in Subsection 1.02-Maintenance of Documents. The accompanying transmittal letter shall contain the following information:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each record
5. Certification that each document as submitted is complete and accurate
6. Signature of Contractor
7. Section reference from the specifications

C. The approved Submittals are a part of the final As-Built/Record Documents must be submitted to the Professional at project completion as a condition for processing final payment to the Contractor.

1.3 RECORDING

A. Clearly label each document "PROJECT RECORD".

B. The Contractor shall keep record documents current.

C. Specification and addenda shall be legibly marked up to record changes made by change or field orders, on other matters not originally specified.

D. All drawings shall be reproducible for future use and reference.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

Division 02

SECTION 02000

SITE PREPARATION

PART 1 GENERAL

1.01 SITE PLAN

A. The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be used for material stockpiles, employee and/or vehicle/equipment parking/storage, the number of trailers to be used, avenues of ingress/egress to the fenced construction area, vehicle and personnel decontamination units, primary roadways within the site, and location of dust/air monitoring devices. Any areas anticipated for use as access roads or which may have to be graveled, or other means, to prevent the tracking of mud onto public roadways shall also be identified and permission gained from the Owner, Professional, Flint Bishop Airport, and local authority, as necessary. In addition, the Contractor shall identify the location, size, and type of vehicle and personnel decontamination units. The site plan shall be submitted as part of the Project Work Plan.

B. Identification of Employees:
The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged in the Work to display identification. Identification shall be kept onsite during periods when an employee is not engaged in work. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works and sign the Sign-In Log on a daily basis. Comply with airport requirements and CQC/CQA Plan for employee identification and sign-in/sign-out procedures.

C. Airport Requirements:
The Contractor shall comply with The Construction Safety Phasing Plan (FAA Form 7460-1). Refer to the approved Construction Safety Phasing Plan (CSPP) in Appendix VIII. The Contractor shall prepare its portion of the CSPP as described in the Appendix.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02110

HANDLING OF HAZARDOUS MATERIALS

PART 1 GENERAL

1.01 DESCRIPTION

A. Potentially hazardous waste materials may be encountered during the excavations and grading of the site. The area is a former Type II landfill where household wastes and demolition materials were deposited. The unearthing/discovering of hazardous wastes is not expected, however, if it is encountered, this section applies to the identification/handling/removal and disposal of those wastes. Non- hazardous wastes encountered, as part of the work during grading and development of the proposed subgrade elevations, shall be redeposited within the boundary of the landfill. Landfill gas, within explosion limits, are likely.

B. Contaminated soils and groundwater are present at the site as identified in the Contract Documents. Refer to Appendices V and VI for soil and groundwater sampling data.

C. Contractor shall be responsible for evaluating the employee exposure risks and complying with all occupational health and safety regulations.

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1910	Occupational Safety and Health Standards
29 CFR Part 1926	Safety and Health Regulations for Construction
40 CFR Part 260	Hazardous Waste Management
40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR Part 273	Standards for Universal Waste Management
49 CFR Part 171	Department of Transportation Regulations to Stipulate Requirements for Containers and Procedures for Shipment of Hazardous Waste
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR Part 173	Shippers General Requirements for Shipment and Packaging
49 CFR Part 177	Carriage by Public Highway
49 CFR Part 180	Rules for Continuing Qualifications and Maintenance of Packaging

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30	(1990) Flammable and Combustible Liquids Code
NFPA 70 B	(1990) Recommended Practice for Electrical Equipment Maintenance
NFPA 325M	Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids

STATE OF MICHIGAN

PA 451, PART 201	Environmental Remediation
PA 451, PART 111	Hazardous Waste Management Act
PA 451, PART 115	Solid Waste Management Act
PA 136	Michigan Liquid Industrial Waste Act

1.03 SUBMITTALS

The following shall be submitted to the Professional in accordance with Section 01330-Submittal Procedures:

A. Project Work Plan

1. Prior to proceeding with the Work, the Contractor shall submit a work plan to the Professional, including the procedures proposed for the removal and disposal of hazardous waste materials, in the event they are encountered and are approved for storage/removal/disposal by the Professional. This plan shall also include the storage and removal/disposal of collected leachate. The Project Work Plan shall provide a detailed description of the methods and equipment to be used for each operation (such as sampling, staging, etc.), site-specific health and safety plan, confined space entry, and sequence of operations.

2. No work at the site, with the exception of site inspection, shall be performed until the Work Plan is approved. The cost of work plan preparation is the responsibility of the Contractor. No adjustment for time or money will be made for resubmittals required as a result of noncompliance.

B. Disposal Documentation

1. The Contractor shall submit to the Professional a report summarizing all activities stated in this Section, including a copy of the records of inspections, tests, and all analytical results for disposal of hazardous contaminated materials.

2. The Contractor shall provide to the Professional copies of all licenses, certifications, permits, agreements, manifests, chain of custody records, weigh tickets, meter recordings, delivery tickets, bills of lading, and receipts required or issued for the transportation and disposal of materials, the methods used, and the disposal areas and facilities. The Contractor shall also provide to the Professional a copy of the results of tests performed to comply with the requirements of each disposal facility.

C. Manifests

The Contractor shall submit to the Professional a copy of the official manifest for each shipment of removed hazardous materials to an approved licensed disposal facility. All manifests shall be in accordance with the requirements of all the applicable federal, state, and local regulations. Manifests shall be signed by the Professional, the Owner, or Owner-authorized representative.

1.04 SAMPLING AND ANALYTICAL TESTING

A. All sampling and analysis shall be conducted as required by the waste disposal facility and in compliance with applicable laws. Any sample collection and shipping costs shall be paid for by the Contractor and is incidental to the Contract.

B. The waste characterization sampling and analytical requirements for all material disposal shall be the Contractor's responsibility.

1.05 REGULATORY REQUIREMENTS

The Contractor shall comply with all applicable federal, state, and local regulatory requirements related to the work summarized in this Section.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 GENERAL

A. Preparation

The Contractor shall be responsible for obtaining all required permits, including confined space entry permits. The Contractor shall provide approved containers, vehicles, equipment, labor, labels, manifests, and any other documents necessary for accomplishment of the Work.

B. Safety Guidelines

1. All work associated with hazardous materials shall be at the appropriate Personal Protection Level, as defined by 29 CFR Part 1910, especially Section .120 and Occupational Safety and Health Administration (OSHA). In the event that unknown hazardous material is identified at the site, the work shall be performed in at least Level B protection, as defined by OSHA. Contractor shall be responsible to determine the appropriate level of protection based on site conditions.

2. Personnel working inside the site boundary shall be trained and made thoroughly familiar with the safety precautions, procedures, and equipment required for controlling the potential hazards associated with this work.

C. Control of Work

The Contractor shall perform work in accordance with the requirements of the drawings and specifications and shall take direction only from the Professional and Owner for this contract. Any other party that proposes to give direction to the Contractor shall be immediately referred to the Professional.

3.02 PROTECTION

As part of the overall Site-Specific Health and Safety Plan, the Contractor shall monitor air quality at the site, as required to protect workers and the public, and as described in other portions of the Specifications. The Contractor shall establish action levels for organic vapors, dusts, etc. to protect the health and safety of the employees and other onsite personnel. In addition, the oxygen and

combustible gas levels shall be monitored if deemed necessary, or if removal operation of hazardous material is in the confined space. The Contractor may use stricter standards for working under such conditions.

3.03 REMOVAL AND DISPOSAL

A. General

The Contractor shall provide all labor, materials, equipment, transportation, packaging, sampling and testing, and incidentals required to perform removal and disposal of hazardous contaminated materials. The hazardous contaminated materials shall be handled in accordance with all applicable RCRA, federal, state, and local regulations.

B. Hazardous Materials

All hazardous materials shall be removed from the site and recycled or disposed of in an approved licensed facility. Contractor shall provide the Professional with manifests, certificates, and other such evidence as may be required by federal, state, and local regulations, to show that hazardous waste materials of all types were properly transported to, received at, and recycled/disposed of in approved recycling/disposal facilities. Contractor shall manage universal waste in accordance with all local, state, and federal regulations including but not limited to 40 CFR 273.

C. Lead

Grading and soil excavation/backfilling/transport shall be handled in accordance with applicable federal, state and local regulations, and the requirements of the disposal facility if applicable.

D. PFAS/PFOA/PFOS

Recent sampling has identified some of these compounds exist at the Site. See Appendix VI for previous sampling data. All work conducted, shall consider these compounds.

3.04 TRANSPORTATION

Transportation of hazardous materials and universal wastes shall be in accordance with DOT, federal, state, and local laws and regulations. Universal wastes shall be placed in the appropriate disposal containers for transport to the disposal/recycling facility and labeled in accordance with all local, state, and federal regulations.

3.05 DISPOSAL

Disposal of hazardous materials and universal wastes shall be in accordance with all federal, state, and local solid and hazardous waste laws and regulations, including RCRA, Act 136, Act 451, TSCA

regulations, and conditions specified herein. Contractor shall obtain the required disposal approval and permits necessary for the proper disposal. Contractor shall be responsible for completing all required manifesting and other paperwork, and providing the proper transportation and disposal documentation for all wastes including, but not limited to, the universal wastes to the Professional.

END OF SECTION

SECTION 02117

LEACHATE STATION AND STORAGE SYSTEM INSTALLATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Installation of manhole, piping, valves, pumps, controls, power (solar), telemetry, alarms and all necessary appurtenances to provide for a complete pumping system. Provide temporary storage tank (frac). The frac tank shall hold a minimum of 21,000 gallons.

B. Installation of power and control shall be in accordance with manufacturer's specifications and Federal and State regulations.

C. Installation and testing of new leachate piping system between the frac tank and leachate pump.

1.02 RELATED SECTIONS

A. Section 02000-Site Preparation
B. Section 02315-Excavation and Fill
C. Section 02110-Hazardous Materials
D. Section 02950-Site Restoration
E. CQA/CQC (Appendix IX)
F. MDOT Standard Plans in the Appendices

1.03 PROJECT/SITE CONDITION

A. The new leachate collection system (collection of liquids below the liner, at the toe of the liner) will be located on the northeastern portion of the new landfill cap, as identified in the Drawings. A temporary frac tank will receive collected leachate, where it will be regularly hauled away for disposal. At the end of the O&M period, the Contractor shall disconnect and remove the frac tank from the site.

B. The Contractor shall install, test and place in service the leachate collection and temporary storage systems in compliance with applicable with the Specifications and Drawings, Federal and State rules, regulations and standards.

PART 2 PRODUCTS

A. Pumping Station (System): Furnish and install a complete submersible pumping system into the manhole, as shown on the Drawings. The controls and solar power units shall be installed just outside of the manhole. The pump shall be suitable for vertical installation. The system shall be sized for a flow rate of 6 GPM (min.) at 50' total head during maximum solar input. Minimum motor requirements are: 0.7kW, Eff. 92%, motor speed 900-3300 RPM, Enclosure Class IP68, progressive cavity helical rotor, EC drive 600hr energy, sacrificial

anode, 1.25” NPT discharge nozzle, and 50’ f power cable. Power cable shall contain no splices, waterproof, and chemically resistant to landfill leachate. Supply stainless steel lifting cable of sufficient strength to raise and lower pump, accessories, and pipe. Anchor cable to manhole. Supply solar panels (HELiOS PSC SOL190), support system, and foundation. Provide PS2-600 Energy Controller-0.7kVa, pump controller, data module, solar (PV) operation.

Major components shall be constructed of stainless steel and seals shall be Teflon or Viton. All components shall be resistant to landfill leachate. The system shall include a check valve near the pump with housing and disk constructed of stainless steel with Teflon or viton seals.

Supply a submersible level switch capable of sensing liquid level in the manhole for “pump-on/off” operation. When the float senses a low level, it shall disengage the pump, otherwise the pump shall remain engaged (Pump-On), unless a high frac tank level is detected. Supply a high level float switch in the frac tank, which will disengage the pump. Supply an intrinsically safe circuit with chemical resistant cable of adequate length for the level. Atmosphere in the manhole and frac tank is considered an explosive environment.

Pump controller shall constantly record operational data and provide access to key information for the operator. The flow shall be infinitely controlled, interval and time of day timers can be set and other sensors can be used to ensure the pump system can manage levels and desired operations. A Sun Sensor shall be included to estimate irradiation levels and control the pump based on power availability.

The pumping system shall include the following items (at a minimum):

- PS2-600 HR-07 Leach Solar Submersible Pump System for 4” wells, including PS2-600 controller with Data Module, Solar(PV)/battery operation, ECDRIVE 600-HR motor, PE HR-07 Leach pump end, PV Module rated for application, PV Mounting System, PV Disconnect, Pole Mount Accessory Bracket, and Sun Sensor Module.

  Acceptable Manufacturers:

  A. Leachate Pumping System: Lorentz. (Local sales representative: Enviro-Sol, 3939 County Road 135, Millersburg, OH 44654, 330-893-3785)

- MNSPD-300, MidNite Solar Surge Protection Device, for max 300V, 5/8 Ground Rod, Ground Rod Copper, WEEB-LUG-6.7AS, Grounding Lug for PV Modules
- Flow Sleeve Kit for 4" HR Pumps, adapter, pipe D125x5x800mm, clamps, and screws
- Submersible Level Sensor, 0-5 PSI, 4-20 mA, with 50' polylead
- Float sensor for frac tank
- Breakout Box, NEMA 4X non-metallic enclosure, junction box for 1 ea. level sensor. Includes desiccant dryer, bellows, intrinsically safe barrier, and connection terminals

B. Valves: All ball valves shall be full port, constructed of PVC or CPVC, viton seals and seats, true union ends, and rated for up to 150 psi at 73 °F. Check valves shall be ball or swing

style and be constructed of PVC or CPVC, viton seals and seats, true union ends, and rated for up to 150 psi at 73 °F

Acceptable Manufacturers:

A. Chemtrol® - Nibco
B. Dou-Bloc ® - Asahi-America

C. HDPE Piping: All HDPE pipe and fittings shall be manufactured from virgin polyethylene resin, PE 3408 or approved equal, and shall conform to ASTM D 3350 minimum cell classification 345434C and material classification III C 5 P34 per ASTM -1248. Unless noted otherwise, all pipe shall be SDR 11 rated at 80 psi at 140 °F, and shall be CSR Polypipe™, DriscoPlex™ 6400, or approved equal. Unless noted otherwise, all fittings shall be SDR 11 rated at 80 psi at 140 °F, and shall be CSR Polypipe™, DriscoPlex™ 6400, or approved equal.

Pipe shall be marked at intervals of 5 feet or less with the following information, at a minimum: Manufacturer's name, nominal pipe size, type of pipe, standard dimension ratio (SDR), ASTM D2513, date of manufacture and lot or batch number. All piping and valves shall be supported by the size and style supports shown in the Drawings, or an approved equal. Fitting shall be of same manufacturer as pipe provided

Fittings from polyethylene compound having cell classification equal to or exceeding the compound used in the pipe to ensure compatibility of polyethylene resins. Provide manufacturer's standard molded fittings rather than field or factory fabricated fittings in available diameters, whenever possible.

PART 3 EXECUTION

3.01 PREPARATION

A. Personnel shall be appropriately trained and shall adhere to all safety precautions, procedures, regulations, and equipment required for controlling the potential hazards associated with the Work.
B. Personnel shall be appropriately trained for the installation of power and control systems for the leachate pumping equipment.
C. Each length of pipe and each fitting shall be carefully inspected prior to lowering into trench. All materials not meeting the requirements of these Specifications, or otherwise found defective or unsatisfactory by the Engineer, shall be rejected and immediately marked and removed from the job site by the Contractor on the same working day as so discovered.
D. Bedding, sub-bedding, and other trench conditions shall be carefully inspected prior to laying pipe or manhole in each stretch of open excavation. All conditions shall be made available to the Engineer for inspection purposes, and the Engineer shall be further advised where, in the Contractor's opinion, unstable or otherwise deleterious conditions exist.
E. The Manhole and each stretch of completed pipeline shall be inspected prior to backfilling. Backfilling operations shall not be initiated prior to inspection by the Engineer. Replace/repair GCL liner if damaged during the Work.

F. If any defective pipe is discovered after being placed, removal and replacement with sound pipe shall be required at no cost to the Owner.
G. Comply with CQA/CQC Plan and Standard MDOT Plans.

3.02 MANHOLE AND PIPING INSTALLATION

A. Manholes and pipes shall be installed in the locations and to the required lines and grades as shown on the Drawings and provided in these Specifications, using an approved method of control. The Engineer has the authority to order the removal or relaying of all pipe laid contrary to the specifications, instructions by the Engineer, or absence of the Engineer. Install manholes in accordance to MDOT Standard Plans and 2012 MODT Specifications.

B. All installed piping shall form completely connected systems, including connections to valves and appurtenances specified in other Sections, to result in a satisfactorily operating installation.

C. HDPE pipe should be joined by butt-fusion methods, having a completely uniform and monolithic pipe interior according to the fusion joining procedures as instructed by the manufacturer

D. Provide an air test on the piping in accordance with the manufacturer's recommendations. Test pressure shall be two times the anticipated operational pressure (10 psi minimum). Duration of the test shall be at least one hour. Test will be considered passing when, pressure drop over 1 hour period does not exceed 1% of test pressure. Correct pressure drop for temperature.

3.03 LEACHATE PUMPING SYSTEM, CONTROLS, AND POWER

A. Install solar panels, controls, pump, electrical wiring, in accordance with the manufacturer's recommendations, local codes, and the Contract Documents.

3.05 BACKFILLING

Please refer to Section 02315-Excavation and Fill and MDOT Standard Plans.

3.07 PROJECT DOCUMENTATION

The Contractor shall submit to the Professional, within 14 days of completing Work, a copy of the following project documentation:

A. Copies of all notifications and approvals required by the Federal, State, and local regulations.
B. Pressure test results, weigh tickets.
C. Pumping system manufacturer instruction, operation and maintenance manual, documentation and guidelines.

END OF SECTION

SECTION 02120

OFFSITE TRANSPORTATION AND DISPOSAL

PART 1 GENERAL

1.01 WORK INCLUDED

A. Ensure that all vehicles entering and leaving the site comply with all safety requirements and licensing requirements of the Federal, State, and local regulations.

B. Prepare vehicles to prevent spillage, leakage or contamination.

C. Inspect vehicles before leaving the site.

D. Transport equipment to and from the site.

E. Transportation and disposal of hazardous and non-hazardous material, soils, groundwater, debris and waste generated from excavation activities in accordance with all local, State, and Federal solid and hazardous waste laws and regulations, and conditions specified herein,

1.02 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1910	Occupational Safety and Health Standards
29 CFR Part 1926	Safety and Health Regulations for Construction
40 CFR Part 261	Identification and Listing of Hazardous Waste
40 CFR Part 262	Standards Applicable to Generators of Hazardous Waste
40 CFR Part 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
49 CFR Part 171	Department of Transportation Regulations to Stipulate Requirements for

	Containers and Procedures for Shipment of Hazardous Waste
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR Part 173	Shippers General Requirements for Shipment and Packaging
49 CFR Part 177	Carriage by Public Highway
49 CFR Part 180	Rules for Continuing Qualifications and Maintenance of Packaging

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30	(1990) Flammable and Combustible Liquids Code
NFPA 70 B	(1990) Recommended Practice for Electrical Equipment Maintenance
NFPA 325M	Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids

STATE OF MICHIGAN

PA 451, PART 201	Michigan Natural Resources and Environmental Protection Act
PA 451, PART 211	Underground Storage Tanks
PA 451, PART 213	Leaking Underground Storage Tanks
PA 451, PART 111	Michigan, NREPA Hazardous Waste Management Act
PA 451, PART 115	Michigan, NREPA Solid Waste Management Act
PA 136	Michigan Liquid Industrial Waste Act

1.03 PERMITS, LICENSES, AND CERTIFICATIONS

The Contractor shall obtain all applicable permits, waste approvals, and State licenses required for transportation and disposal of any debris or waste resulting from the Work.

1.04 SUBMITTALS

A. The Contractor shall submit the names of the disposal facilities and verification that each facility is properly licensed by State and Federal agencies to accept the types and quantities of intended debris, materials or waste. This information shall be submitted to the

Professional for approval, as specified in Section 01330-Submittal Procedures.

B. Before disposal operations begin, the Contractor shall submit the transportation routes to the selected solid and liquid disposal facilities to the Professional for approval. The Contractor shall use designated truck routes and shall comply with all seasonal load restrictions.

C. The Contractor shall submit a Spill Contingency Plan for transportation of solids and liquid to the Professional for approval before disposal operations begin. This plan shall address all the potential hazards, necessary actions to follow in case of spills, and emergency phone numbers enroute to each disposal facility.

D. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as directed by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts and manifests to the Professional at the end of each day that material is shipped offsite and upon request.

E. The Contractor shall submit copies of all manifests and bills of lading to the Professional during transportation and disposal operations.

F. The Contractor shall submit a Decontamination Plan that includes vehicle decontamination and prevention of contaminants and mud-tracking offsite.

G. All cost for submittals are incidental to the project.

1.04 PROJECT RECORD DOCUMENTATION

A. Contractor shall prepare waste transportation and disposal manifests and all other documents required for waste shipment and disposal for each load of waste materials being transported and disposed. The Contractor is responsible for obtaining the Professional, Owner, or Owner-authorized representative's signature on manifests for transportation and disposal purposes.

B. Contractor shall verify and record weight, volume, and character of material disposed. The Contractor shall provide documentation that the measuring devices used are certified by the appropriate State inspection agency.

C. The Contractor shall provide to the Professional written documentation and records

verifying receipt and the quantity received of each load at the disposal facility and verification of proper disposal. Copies of the actual receipt must be provided.

D. The hazardous waste manifests and forms will be consistent with the State of Michigan, US EPA, and U.S. Department of Transportation requirements.

E. All of the materials shall be sampled and analyzed in accordance with the requirements as required by the appropriate disposal/recycling facility, and by applicable regulations.

PART 2 PRODUCTS

2.01 EQUIPMENT

The Contractor shall provide equipment, personnel, and facilities necessary to handle, load, and effectively manage materials for transport to off-site disposal/recycling facilities.

PART 3 EXECUTION

3.01 LOADING AND HAULING

A. All haul vehicles are to be inspected by the Contractor for soil adhesion to wheels, under carriage, and other external components. These soils shall be removed and properly handled by the Contractor before the haul vehicle leaves the site. The decontamination procedures shall be carried out in the decontamination zone. Before leaving the site, all vehicles shall be approved by the Professional. All rinse waters are to be collected for temporary storage prior to disposal. The Contractor will sample collected rinse waters to ensure proper disposal. Contractor shall be responsible for the disposal and any associated testing. All associated decontamination costs are incidental to the project.

B. Transport vehicles shall not be allowed to leave the site if they are leaking or spilling materials or there is evidence that leaking or spilling may likely occur.

C. All transport vehicles shall be in strict conformance with all the applicable Federal, State, and local laws.

D. The Contractor shall keep accurate records for the following information: Type and quantity of materials, including liquids, removed from the site and analytical testing results. Professional approval is required before any liquid or material leaves the site.

E. The Contractor shall provide the Professional with copies of the aforementioned records, all permits required, manifests, waste hauling permits, and necessary affidavit regarding the waste materials, including liquid disposal.

F. All transport vehicles shall be cleaned before loading with waste material.

G. Prior to transportation, all of the established pre-transportation requirements shall be met.

H. The waste shall be transported by an appropriately certified waste hauler in approved labeled containers.

I. No activities, including loading, shall occur in areas that will obstruct the view of traffic.

J. The Contractor shall clean the ingress/egress routes as needed, and all waste loading and hauling shall be conducted in accordance with MDOT and local standards and regulations.

3.02 DISPOSAL

A. All disposal activities shall conform to Federal, State, and local government regulations.

B. For contaminated wastes, the Contractor shall use a State of Michigan-approved manifest system or the manifest system approved by the State where the receiving facility is located, so that the waste can be tracked from generation to ultimate disposal. The manifest shall comply with all of the provisions of the transportation and disposal regulations. All transporters must sign the appropriate portions of the manifest and must comply with all of the provisions established in the applicable regulations. Waste manifests must be signed by the Professional, Owner, or Owner-authorized representative.

C. The waste manifest shall comply with all of the provisions of the transportation and disposal regulations. All transporters must sign the appropriate portions of the manifest and must comply with all of the provisions established in the applicable regulations.

D. Contaminated materials shall be disposed of at a Professional or Owner pre-approved licensed disposal/recycling facility.

E. All arrangements and scheduling with the disposal facility shall be performed by the Contractor. The Contractor is also responsible for all waste characterization sampling and analysis required for disposal. The Contractor is also responsible for obtaining necessary approvals from the disposal facilities.

3.03 SPILLS

The Contractor is responsible for cleaning up all leaks and spills that occur from containers and other items onsite or offsite. Immediate containment actions shall be taken, as necessary, to minimize the effect of any spill or leak. The Contractor shall notify the Professional and appropriate governmental authorities of the incident. Cleanup shall be in accordance with applicable Federal, State, and local laws and regulations at no additional cost to the Owner.

END OF SECTION

SECTION 02130

SITE DECONTAMINATION

PART 1 GENERAL

1.01 SUBMITTALS

A Decontamination Plan shall be submitted to the Professional as part of the Project Work Plan, in accordance with Section 01330-Submittal Procedures. The Decontamination Plan shall include the following information:

A. Decontamination zone/area location.

B. Materials and equipment used for decontamination, such as pressure washers, decontamination pad construction, etc.

C. Procedures and methods for personnel, equipment, and vehicle decontamination.

D. Rinse water collection and containment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 DECONTAMINATION

A. The Contractor shall provide, operate, and maintain decontamination units for personnel, equipment, and vehicles at the project site as approved by the Professional. The decontamination unit shall serve to remove, to the best extent possible, contaminated soil and materials from equipment and vehicles before they exit the site. The Professional may restrict vehicles from leaving the site until the vehicles are decontaminated to the approval of the Professional.

B. All vehicles that come in contact with contaminated material and/or as specified by the Professional shall be decontaminated. Soils or contaminants shall be removed and properly handled by the Contractor. At a minimum, the Contractor shall provide wheel and under carriage wash using high-pressure water or steam. The rinse waters used in the operation shall be collected, stored, sampled, and properly disposed of, based on corresponding waste characterization analytical results. The Contractor shall coordinate these activities.

C. All costs associated with decontamination, including, but not limited to, materials, equipment, analyses, transportation, and disposal, are incidental to the project.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Clearing and grubbing shall be performed, if necessary, to provide access to perform the demolition and excavation work.

B. Prepare, obtain the approval of the City of Flint and/or other agencies, and implement a Traffic Control Plan, if required by the City of Flint and/or other agencies.

C. All utilities, power/utility poles and related infrastructure on the property belonging to other entities shall be protected.

1.02 DEFINITIONS

A. Clearing

Clearing is defined as the removal of trees, brush, shrubs, down timber, rotten wood, rubbish, any other vegetation and objectionable material at or above original ground elevation not designated to be saved. Clearing also includes removal of fences, walls, guard posts, guide rails, signs, debris, and other obstructions that obtrude, encroach upon or otherwise interfere with the proposed Work.

B. Grubbing

Grubbing is defined as the removal of stumps, roots and stubs, brush, organic materials and debris from below the ground surface.

1.03 PROJECT/SITE CONDITIONS

The Contractor shall clear all obstructions within the excavation limits of Work and as shown on the Contract Drawings. Owner or Professional. Trees, cleared brush, stumps, and vegetative debris shall become the property of the Contractor.

1.04 SUBMITTALS

Contractor shall submit a letter of acceptance from the proposed disposal facilities and provide certificates of disposal.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION

A. Notify the Professional at least 24 hours prior to beginning any clearing or grubbing work.

B. Protect permanent/temporary benchmarks, monitoring wells, signs, and utilities, and other structures.

C. Contractor shall notify the Professional, at least 72 hours in advance of the clearing/grubbing operations, so that a record can be made of the type or kind of trees and their condition.

D. Where it is necessary to cut branches of trees that are not to be removed, the cut shall be made flush with the tree trunk or larger branch, care being used to prevent tearing the bark beyond the cut, and the cuts shall be painted with acceptable commercial tree wound dressing.

3.02 UTILITIES

A. Inform all companies, individuals, and other entities owning or controlling facilities or structures within the limits of the Work which have to be relocated, adjusted, or reconstructed in sufficient time for the utility to organize and perform such Work in conjunction with or in advance of the Contractor's operations.

B. Comply with the provisions of Michigan Public Act (PA) 53 of 1974 "Protection of Underground Facilities

3.03 CLEARING

A. Clearing shall be performed as necessary to facilitate the completion of the Work and as otherwise directed by the Professional.

B. Fell trees in a manner that will avoid damage to trees, shrubs, and other installations which are to be retained. The Contractor shall replace trees and shrubs intended to remain that are damaged beyond repair or removed.

C. Remove guard posts, guide rails, signs, and other interferences as necessary for performance of the Work. Protect and store the materials in secure locations approved by the Owner or the Professional, and replace when work is complete.

3.04 GRUBBING

A. Grub areas within the excavation limits to remove roots and other objectionable material to a minimum depth of 12 inches.

B. Remove all stumps within the cleared areas unless otherwise authorized by the Professional.

3.05 DISPOSAL

A. Trees, cleared brush, stumps, and vegetative debris shall become the property of the Contractor and properly disposed at a preapproved location, unless otherwise approved by the Owner and/or the Professional.

B. Burning of trees, logs, branches, brush, stumps, and debris is prohibited.

3.06 RESTORATION

A. Replant in kind all trees removed from adjacent properties.

B. Replace all facilities disturbed during the work.

END OF SECTION

SECTION 02315

EXCAVATION, FILL, AND MISCELLANEOUS MATERIALS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Installation of rip rap, aggregate, and geotextile.

B. General backfilling, leveling, and compacting.

C. Installation of drainage pipe, drainage structures.

D. Sampling and testing of backfill materials are the responsibility of the Contractor.

1.02 RELATED SECTIONS

A. Section 01740-Cleaning

B. Section 02130-Site Decontamination

C. Section 02370-Soil Erosion and Sedimentation Control

D. CQC/CQA Plan (Appendix IX).

1.03 REFERENCES

The following publication of the issue listed below forms a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

MDOT	Standard Specifications for Construction, 2012 Edition
ASTM D 2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods
ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
OSHA	1926 Subpart P – Excavations
ASTM D 442	Standard Test Methods for Particle-Size Analysis of Soils
MDOT	Soil Erosion and Sediment Control Manual, March 2021 (Also see Appendix X for excerpts from this manual)

1.04 DEFINITIONS

A. Competent Person: Competent Person is an individual who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA 29 CFR 1926.650. It is the responsibility of the Contractor to have a Competent Person at the site during the excavation and related activities.

B. Contaminated soils: Contaminated soil includes, but is not limited to: previously deposited Type II landfill materials including: soil, concrete, asphalt, rubble, household rubbish, drums, demolition materials, and all other materials in contact with waste.

C. Uncontaminated soils: Uncontaminated soil includes uncontaminated soil material from the existing cap, screened and approved by the Professional, or offsite tested and approved fill materials.

1.05 TESTS

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner. Testing shall be performed by an approved commercial testing laboratory or may be performed by the Contractor, subject to approval by the Professional and Owner. The **CONTRACTOR** shall sample and test all offsite materials for use at the site to ensure compliance with the Specifications. Each fill material type shall be sampled and tested as stated in the CQC/CQA Plan (Appendix IX). Onsite material used for this project will not require testing

A. The Contractor shall characterize all materials that are to be removed from the site for disposal or recycling, as required by the disposal facility.

B. During backfilling and compaction of Structural fill, compact backfill materials. Compaction testing shall be conducted in accordance with the CQC/CQA Plan. A third-party testing firm shall verify that compaction requirements were met. A professional engineer shall certify the compaction test results. The Contractor is responsible for the cost of the testing and certification.

C. Gradation tests and moisture/density tests for each type of fill material in accordance with the CQC/CQA Plan.

D. The Contractor shall submit MDOT classification and analytical results from all fill material to the Professional to verify that backfill from offsite sources are uncontaminated.

E. The Contractor shall submit analytical results (including volatile organic compounds, polynuclear aromatic compounds, and metals) verifying that backfill material is uncontaminated.

1.06 SUBMITTALS

A. Project Work Plan

Procedures, methods, materials, and other information regarding excavation/grading and backfill shall be included in the Project Work Plan developed by the Contractor, as specified in Section 01330-Submittal Procedures and the CQC/CQA Plan. The Contractor shall implement and maintain the work plan for all site activities as part of this work. The cost of work plan preparation is incidental to the project. No adjustment for time or money will be made for resubmittals required as a result of noncompliance. The following information regarding excavation and backfilling shall be included in the Project Work Plan, at a minimum:

1. Project Schedule
2. List of Subcontractors
3. Description of the methods and equipment to be used for each related operation (i.e., excavation, transportation, sampling, etc.).
4. Temporary storage for stockpiled contaminated soil
5. Transportation company
6. Disposal facilities
7. Method to protect any storm sewers and conveyances (drains/creeks/storm sewers) during soil excavation in close proximity of the site.
8. Description of the means, methods, and procedures for site restoration.
9. Identify competent person as defined by OSHA, and provide qualifications.

B. Backfill Material

The Contractor shall submit data on proposed backfill material to the Professional for approval. This data shall include the source of backfill material; grain size analysis, including MDOT classification; compaction test results of backfill; and analytical results (including volatile organic compounds, polynuclear aromatic compounds, and metals) verifying that backfill material is uncontaminated. Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner.

C. Analytical Reports

The Contractor shall submit to the Professional all analytical results of the backfill, waste characterization, and any other samples collected/required for the Work.

D. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale

facility, as approved by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts and manifests to the Professional at the end of each day that material is shipped offsite and upon request.

E. Daily Site Activity Reports

The Contractor shall submit its Daily Site Activity Reports to the Professional, on a weekly basis and upon request.

1.07 PROJECT COORDINATION

A. The Contractor shall carefully coordinate the work in this Section with all other work, including airport personnel, regulations and restrictions. The work shall be compliant with Occupational Safety and Health Administration (OSHA) and Federal Aviation Administration (FAA) regulations and other applicable safety requirements.

B. The Contractor shall verify utility line locations that are in close proximity to the work areas. Utility lines may include, but are not limited to, the following: electric. Contractor shall take precautions to protect all utilities and is responsible for the repair/replacement of any damages caused by the Contractor at no cost to the Owner. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to: electric and storm sewer.

PART 2 PRODUCTS

2.01 MATERIALS

A. All fill materials are subject to the approval of the Professional.

B. General Fill - General fill shall be Material free from organic matter, masonry, metal, sharp objects, boulders, snow, and ice and shall have no solid material larger than 2 inches in its largest dimension. MDOT Class IIA and MDOT Class IIAA soils are acceptable. The soil shall not include blast furnace slag or any hazardous substances.

C. Structural Fill – Structural fill shall be in accordance with MDOT Class IIA as noted in the 2012 MDOT Standard Specifications, Section 902.

D. Rip Rap – Meeting the definition of MDOT Specification for the Rip Rap. Prior approval of Rip Rap from offsite sources is required from the **ENGINEER**.

E. Reinforced Concrete Pipe - Meeting the definition of Class III RCP as specified in Section 909 of the MDOT Specifications.

F. 22A and 6A Course Aggregate - Meeting the definition of MDOT 6A and 22A aggregate as specified in Section 902 of the MDOT Specifications.

G. MDOT Class IIA Granular Material - Satisfactory materials shall be from ENGINEER approved offsite sources of MDOT Class IIA and shall be free of trash, debris, roots, and other organic matter.

H. MDOT Class IIAA Granular Material - Satisfactory materials shall be from ENGINEER approved offsite sources of MDOT Class IIA and shall be free of trash, debris, roots, and other organic matter.

I. Geotextile – Meeting the definition of MDOT Geotextile Liner as specified in Part 910.03.B. or as specified on the Drawings for use in roadbed construction.

J. Geosynthetic Clay Liner – Acceptable Manufacturers

1. CETCO – Bentomat® 600 CL
2. Solmax – Bentoliner® NS
3. Engineer approved alternate

K. 4" Drainage Tile - Meeting the definition of MDOT Corrugated Plastic Tubing for Underdrains as specified in Part 909.07. Geotextile wrap for the drain as specified in Table 910-1.

L. Peastone - Meeting the definition of MDOT 34R or 34G open graded aggregate as specified in Section 902 of the MDOT Specifications

M. Backfill material - Satisfactory materials shall be MDOT Class IIA granular material, MDOT 22A aggregate material, and MDOT 34R pea stone material and shall be free of trash, debris, roots, other organic matter, slag, and crushed concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Excavation/grading and associated activities shall be conducted in the areas identified in the Drawings and as directed by the Professional.

B. Establish a truck wash area for the removal of mud/sediments from the vehicles leaving the site. Establish a truck wash and decontamination area for the removal of mud/sediments/contaminated materials from the vehicles leaving the landfill boundary.

C. The Contractor shall take extreme care during the site activities to prevent cross contamination. Adequate measures shall be taken to prevent surface water from entering Work areas.

D. The Contractor shall contact MISS DIG and other applicable local utility companies/authorities for utility identification a minimum of three workdays prior to any excavations. The Contractor shall comply with 1974 PA 53, as amended, MCL 460-701 et seq., and all other laws concerning underground utilities. The Contractor shall verify that all utility lines in close proximity to the Work areas are properly identified, marked, and protected, or capped, as applicable. Contractor shall notify Miss Dig of overhead electric lines where 10-foot clearance could not be maintained.

E. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to, gas, electric, sewer and storm sewer.

F. Personnel working inside and around the excavation areas shall be trained and thoroughly familiar with the safety precautions and equipment required for controlling potential hazards associated with the Work.

G. As applicable, the Contractor shall obtain permission and all necessary permits for any work in adjacent properties, easements, and road rights-of-way. All costs associated with obtaining, submitting and maintaining permits, and permitting fees shall be paid for by the Contractor and are incidental to the project.

H. Prior approval shall be obtained from the Owner and Professional before removal of any trees. Trees shall be removed as directed by the Professional and as necessary for the work. All trees, vegetation, and brush removed must be handled as specified in the CQC/CQA Plan.

I. The Contractor shall be responsible for all sampling and analyses necessary for disposal and/or waste characterization.

J. The Contractor shall saw cut the existing pavement prior to removal of any asphalt.

K. The native soils to be reused as backfill material may be temporarily stockpiled. Stockpiling shall comply with the SESC permit.

L. Laying of geotextile and placement of rip rap shall commence with the lower elevations and proceed to the higher elevations

3.02 PROTECTION

A. The Contractor shall supply a 4’ high temporary fencing and enclose excavations (i.e., manhole excavation, culvert placement, and Temporary Drain Crossing) at the end of each workday. Excavations should be checked each day for adequacy of protection. Cost of the 4’ high temporary fence and daily placement/removals thereof are incidental to the project. Install a large temporary fence along the southern portion of the work area as shown in the Drawings and Appendices. This large temporary fence shall be paid for as described in the Pay Items.

B. Protect the public utilities and any surface water bodies from hazards related to excavation activities, and implement applicable erosion control measures.

C. The Contractor shall grade the excavation perimeter to prevent surface and storm water runoff entering the excavation.

D. The Contractor is responsible for protecting the sides of open excavations, to prevent collapse, and any settlement of adjacent structures. The method of earth support is the responsibility of the Contractor**.**

E. The Contractor shall perform all excavating in accordance with OSHA regulations, including sloping/shoring. Provide maximum safety to the workers employed during all site activities.

F. The Contractor shall provide necessary engineering controls to ensure proper support to the excavation walls, and to support the excavation, buildings and underground structures while excavating soil near adjacent buildings. If an engineered earth support system is used, the Contractor shall remove the earth support system after the excavation has been backfilled. The cost associated with the support systems shall be incidental to the project.

G. As part of the overall Health and Safety Plan, the Contractor shall continuously monitor air quality at the site perimeter, as necessary and as specified.

H. Refer to additional measures as stated in the CQC/CQA Plan.

3.03 EXCAVATION AND GRADING

A. Any further site erosion, due to the **CONTRACTOR's** failure to control such erosion, shall be corrected at the **CONTRACTOR's** expense.

B. The **CONTRACTOR** shall only excavate the areas required for fill/shaping of the landfill, sediment traps, diversion ditches, piping, and as shown on the Drawings and as described in the CQC/CQA Plan.

C. The Contractor's Competent Person shall ensure that the excavation sidewalls are properly sloped/benched and/or properly protected from cave-in accordance with OSHA and other applicable regulations. All excavations below water shall be backfilled immediately upon complete removal of soils/waste material, in order to prevent cave-ins.

D. Refer to additional measures as stated in the CQC/CQA Plan.

3.04 EXAMINATION, TESTING, AND ANALYSIS

A. Refer to measures stated in the CQC/CQA Plan.

B. Verification that the backfill material is uncontaminated is the responsibility of the Contractor. Backfill analytical testing shall be performed at no additional cost to the project. Testing shall be performed by an approved commercial testing laboratory or may be

performed by the Contractor**,** if the Contractor is an approval commercial testing laboratory, the laboratory is subject to approval of the Professional. Geotechnical testing, including density, grain size, moisture content, etc., is the responsibility of the Contractor

3.05 BACKFILLING

A. Fill

1. The Contractor shall ensure that the backfill material to be used is approved by the Professional. Backfill material gradation and compaction is the responsibility of the Contractor.
2. Backfilling shall not begin until contaminated soils are removed as approved by the Professional; and excavations are cleaned of trash and debris.
3. Fill from onsite excavations, within the landfill cap boundaries, shall be placed in the fill areas, prior to the placement of any offsite material.
4. Place geotextile liner material between rip rap and fill as called for on the drawings and as noted in MDOT specifications.
5. Place geosynthetic clay liner as stated in the CQC/CQA Plan and according to manufacturer's installation guidelines.
6. Place and compact Structural fill as stated in the CQC/CQA Plan.
7. The Contractor shall be responsible for coordinating any inspections necessary with State and local agencies, where applicable.

B. Site Restoration and Placement of Materials

1. The **CONTRACTOR** shall restore all ground areas disturbed as a result of the Work and access to the site, to like or better conditions, using material satisfactory to the **ENGINEER** and **OWNER**
2. Placement of geotextile, aggregates, piping, manholes, and rip rap shall be as specified in the applicable sections of the 2012 MDOT Standard Specifications for Construction and these Specifications and Drawings.

3.06 TESTING

A. Testing shall be the responsibility of the **CONTRACTOR** and shall be performed at no additional cost to the project. Testing shall be performed by a **ENGINEER** approved commercial testing laboratory or may be performed by the **CONTRACTOR,** if the **CONTRACTOR** is a **ENGINEER** approved commercial testing laboratory. The laboratory is subject to approval of the **ENGINEER** before placement. Grain size analysis of the backfill material is the responsibility of the **CONTRACTOR**. All test results shall be provided to the **ENGINEER.**

3.07 DISPOSAL

A. The materials required to be removed and disposed of and all waste, excess, and unsatisfactory materials resulting from Work required under this Section shall be removed from the site, unless otherwise specified or directed. All disposal activities shall conform to local, State, and Federal regulatory requirements.

3.08 PROJECT DOCUMENTATION

The Contractor shall submit to the Professional, within 14 days of completing Work, a copy of the following project documentation:

A. Copies of all analyses performed.

B. Appropriate certification of final disposal documentation signed by the responsible disposal facility official.

3.09 QUALITY CONTROL

The **CONTRACTOR** shall establish and maintain a quality control system for all operations performed under this Section, to assure compliance with contract requirements, and maintain records of its quality control for all operations performed, including, but not limited to, the following:

A. Observance of safety regulations

B. Quality of materials

C. Protection, maintenance, and repair

D. Weigh Scale:

1. The **CONTRACTOR** shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a State of Michigan-certified weigh scale facility. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the **ENGINEER**.

D. Refer to additional measures as stated in the CQC/CQA Plan

END OF SECTION

SECTION 02316

TEMPORARY DRAIN CROSSING

PART 1 GENERAL

1.01 WORK INCLUDED

A. A temporary drain crossing will be constructed for the purpose of ingress/egress to the work area and off-site areas. All construction vehicles shall pass over the new drain crossing, with the exception of light weight passenger vehicles, which may pass over the existing bridge.

B. Prior to ordering materials, or conducting any work for this drain crossing, the Contractor shall review the drain permit, a joint permit issued by EGLE and Genesee County (See Appendix XI). The Contractor shall comply with all requirements of the drain permit, specifications, drawings, and this Project Manual.

C. Construct a multi-plate corrugated metal culvert, including installation in an active drain, temporary diverting of the Hewitt Drain during the work, bedding, backfilling, rip rap and construction of a temporary road.

D. Removal of the culvert, backfill, rip rap and all components used to create the temporary drain crossing. Reestablish the drain and its banks to original condition.

1.02 RELATED SECTIONS

A. Section 02000-Site Preparation

B. Section 02315-Excavation, Fill and Miscellaneous Materials

C. Section 02370-Soil Erosion and Sedimentation Control

D. Section 02950-Site Restoration

1.03 REFERENCES

The following publication of the issue listed below forms a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

MDOT	Standard Specifications for Construction, 2012 Edition
ASTM D 2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods
ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
OSHA	1926 Subpart P – Excavations

AASHTO	Standard Specifications for Highway Bridges, Section 26 (Division II)
AASHTO M219	Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches and Arches
ASTM B746	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches

1.04 TESTS

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner. Testing shall be performed by an approved commercial testing laboratory or may be performed by the Contractor, subject to approval by the Professional and Owner.

A. During backfilling and compaction above groundwater table, one compaction test per every other lift for backfill materials, not including MDOT 6A stone or MDOT 34R peastone. Compaction testing shall be conducted for backfill material in accordance with ASTM D 1557-Modified Proctor. A third party testing firm shall verify that compaction requirements were met. A professional engineer shall certify the compaction test results. The Contractor is responsible for the cost of the testing and certification.

B. One gradation test and one modified proctor test for each type of backfill material.

C. The Contractor shall submit analytical results from all backfill material to the Professional to verify that backfill from offsite sources are uncontaminated, and MDOT classification.

1.06 SUBMITTALS

A. Project Work Plan

Procedures, methods, materials, and other information regarding phasing of Work, shop drawings for culvert manufacturer and its related specifications, excavation and backfill shall be included in the Project Work Plan developed by the Contractor, as specified in Section 01330-Submittal Procedures. The Contractor shall implement and maintain the work plan for all site activities as part of this work. The cost of work plan preparation is incidental to the project. No adjustment for time or money will be made for resubmittals required as a result of noncompliance.

The Contractor shall submit data on fill materials to the Professional for approval. This data shall include the source of backfill material; grain size analysis, including MDOT classification; compaction test results of backfill; and analytical results, as specified elsewhere, verifying that backfill material is uncontaminated. Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner.

C. Analytical Reports

The Contractor shall submit to the Professional all analytical results of the backfill required for the Work.

D. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as approved by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts and manifests to the Professional at the end of each day that material is shipped offsite and upon request.

1.07 PROJECT COORDINATION

A. The Contractor shall carefully coordinate the work in this Section with all other work. The work shall be compliant with Occupational Safety and Health Administration (OSHA) regulations and other applicable safety requirements.

B. The Contractor shall verify utility line locations that are in close proximity to the work areas. Utility lines may include, but are not limited to, the following: telephone, cable, electric, water, sewer, fiber optic, and gas lines. Contractor shall take precautions to protect all utilities and is responsible for the repair/replacement of any damages caused by the Contractor at no cost to the Owner. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to, gas, electric, water, sanitary sewer and storm sewer.

PART 2 PRODUCTS

2.01 MATERIALS

A. All backfill materials are subject to the approval of the Professional.

B. Aluminum Structural Plate Corrugated Metal Culvert by Contech. The Aluminum Structural Plate structure shall consist of plates and appurtenant items as shown on the plans and shall conform to the requirements of AASHTO M 219 and ASTM B746. The corrugated plate (and ribs if required) shall be curved and bolt hole punched at the plant. Plate thickness and rib spacings shall be as indicated on the plans. All manufacturing processes including corrugating, punching, and curving, shall be performed within the United States. Bolts and nuts shall conform to the requirements of ASTM A307 or A449 for steel fasteners or ASTM F467 and F468 for aluminum fasteners.

C. MDOT Plain Rip Rap with Geotextile.

D. Backfill material - Satisfactory materials shall be MDOT Class IIA granular material, MDOT 22A and 6A aggregate materials, and MDOT 34R pea stone material and shall be free of trash, debris, roots, other organic matter, slag, and crushed concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Excavation and associated activities shall be conducted in the areas identified on the Drawings and as directed by the Professional.

B. The Contractor shall excavate a temporary diversion drain for the purpose of establishing a working area, free of flowing water, to construct the multi plate culvert in place. Adequate measures shall be taken to prevent surface water from entering Work areas. Dewater work area as necessary.

C. The Contractor shall contact MISS DIG and other applicable local utility companies/authorities, including but not limited to the Bishop International Airport Authority, for utility identification a minimum of three workdays prior to any excavations. The Contractor shall comply with 1974 PA 53, as amended, MCL 460-701 et seq., and all other laws concerning underground utilities. The Contractor shall verify that all utility lines in close proximity to the Work areas are properly identified, marked, and protected, or capped, as applicable. Contractor shall notify Miss Dig of overhead electric lines where 10-foot clearance could not be maintained.

D. Contractor shall provide appropriate supports to the electrical poles and underground utilities including, but not limited to, gas, sanitary sewer and storm sewer.

E. Personnel working inside and around the excavation areas shall be trained and thoroughly familiar with the safety precautions and equipment required for controlling potential hazards associated with the Work.

F. As applicable, the Contractor shall obtain permission and all necessary permits for any work in adjacent properties, easements, and road rights-of-way. All costs associated with obtaining, submitting and maintaining permits, and permitting fees shall be paid for by the Contractor and are incidental to the project.

G. Prior approval shall be obtained from the Owner and Professional before removal of any trees. Trees shall be removed as directed by the Professional. The cost for removal is incidental to the Contract. All trees, vegetation, and brush removed must be transported and disposed in the landfill area.

3.02 PROTECTION

A. The Contractor shall supply temporary fencing and enclose excavations at the end of each workday. Excavations should be checked each day for adequacy of protection. Cost of fence and daily placement/removals thereof are incidental to the project.

B. Protect the public utilities and any surface water bodies from hazards related to excavation activities, and implement applicable erosion control measures.

C. The Contractor shall grade the excavation perimeter to prevent surface and storm water runoff entering the excavation.

D. The Contractor is responsible for protecting the sides of open excavations, to prevent collapse, and any settlement of adjacent structures. The method of earth support is the responsibility of the Contractor**.**

E. The Contractor shall perform all excavating in accordance with OSHA regulations, including sloping/shoring. Provide maximum safety to the workers employed during all site activities.

F. The Contractor shall provide necessary engineering controls to ensure proper support to the excavation walls, and to support the excavation, buildings and underground structures while excavating soil near adjacent buildings. If an engineered earth support system is used, the Contractor shall remove the earth support system after the excavation has been backfilled. The cost associated with the support systems shall be incidental to the project.

G. As part of the overall Health and Safety Plan, the Contractor shall continuously monitor air quality at the site perimeter, as necessary and as specified.

3.03 INSTALLATION

A. The Contractor shall excavate the drain bed to the specified elevation, less one foot. Place a 12" bedding of peastone. The bedding shall be constructed to a uniform line and grade to avoid distortions that may create undesirable stresses in the structure and/or rapid deterioration of the roadway. It should be free of rock formations, protruding stones, and frozen matter that may cause unequal settlement.

B. The Contractor shall follow manufacturers shop drawings and assembly instructions. The structure shall be installed in accordance with the plans and specifications, the manufacturer's recommendations, and the AASHTO Standard Specifications for Highway Bridges, Section 26 (Division II). Due to the size of the proposed culvert, it is assumed the culvert will be assembled in the drain bed.

C. During installation and prior to the construction of permanent erosion control and end treatment protection, special precautions may be necessary. The structure must be protected from unbalanced loads from any structural loads or hydraulic forces that might bend or distort the unsupported ends of the structure. Erosion or washout of previously placed soil support must be prevented to ensure

that the structure maintains its load capacity.

D. Install Plain Rip Rap on all 1 vertical to 2 horizontal, or steeper slopes.

E. Install temporary Road as specified and illustrated in the Drawings and Specifications.

F. Seed and mulch disturbed vegetated areas.

3.04 BACKFILLING

A. Backfilling

1. The Contractor shall ensure that the backfill material to be used is approved by the Professional. Backfill material gradation and compaction is the responsibility of the Contractor.

2. Backfilling shall not begin until the grades and lines are approved by the Professional; and excavations are cleaned of trash and debris. The backfill material should be free of rocks, frozen lumps, and foreign material that can cause hard spots or decompose to create voids. Backfill must be placed symmetrically on each side of the structure in eight-inch loose lifts.

3. Pea stone (MDOT 34R) bedding shall be placed in the excavations to a minimum height of approximately 12 inches from subgrade, as approved by the Professional. Compaction is not required for the peastone. Use MDOT 6A aggregate from the peastone to the springline (widest part of the culvert). A non-woven needle punched geotextile fabric shall be placed in between the MDOT 6A and sand (MDOT Class II). The fabric is subject to the approval of the Professional.

4. MDOT Class II sand shall be placed above the geotextile fabric in horizontal layers not exceeding 8 inches in loose thickness, or 6 inches when hand-operated compactors are used. Each layer of backfill shall be compacted to not less than the 90 percent of the maximum dry density, as determined by ASTM D 1557 – Modified Proctor. The cost for the Modified Proctor testing is incidental to the cost of the project. Contractor shall utilize compaction methods and techniques such that the structural integrity of the culvert shall not be impacted.

5. The Contractor shall be responsible for coordinating any inspections necessary with State and local agencies, where applicable.

3.05 DISPOSAL

The materials required to be removed and disposed of and all waste, excess, and unsatisfactory materials resulting from Work required under this Section shall become the property of the Contractor and be removed from the site, unless otherwise specified or directed. All disposal activities shall conform to local, State, and Federal regulatory requirements.

3.06 PROJECT DOCUMENTATION

The Contractor shall submit to the Professional, within 14 days of completing Work, a copy of the following project documentation:

A. Copies of all testing performed.

B. Copies of all weight tickets.

3.07 QUALITY CONTROL

The **CONTRACTOR** shall establish and maintain a quality control system for all operations performed under this Section, to assure compliance with contract requirements, and maintain records of its quality control for all operations performed, including, but not limited to, the following:

C. Observance of safety regulations

D. Quality of materials

E. Protection, maintenance, and repair

END OF SECTION

SECTION 02320

WELL INSTALLATION AND ABANDONMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish and install monitor wells as shown on the Drawings.

B. Abandon existing monitor wells as shown on the Drawings.

1.02 DISPOSAL OF WATER AND SOLIDS

A. The **CONTRACTOR** shall make all provisions necessary for managing any groundwater brought to the surface during installation activities, including characterization sampling, transportation, and proper disposal, as needed. The **CONTRACTOR** shall prevent development and decontamination water from flowing into any adjacent wells, surface water bodies, or storm collection system.

B. The **CONTRACTOR** shall transfer the solids resulting from the installation activities, including personal protective equipment, to a designated staging area at the site, for proper characterization and disposal.

C. All soil cuttings, purge water, and decontamination water will be containerized in appropriately labeled Michigan Department of Transportation (MDOT) approved, 55-gallon drums, and staged at the Site. Field personnel will utilize disposable nitrile gloves during purging, sampling, and decontamination operations. PROFESSIONAL will maintain documentation regarding the types and quantity of drums stored at the Site. PROFESSIONAL will properly characterize all drums and coordinate the expeditious disposal of all drums, pursuant to all local, state, and federal regulations and policies. It is estimated that one composite soil and water sample will be collected for waste characterization analyses of VOCs, total Michigan 10 metals, PFOAs, and total and available/amenable cyanide, and as required by the disposal facility. Upon authorization by the OWNER, PROFESSIONAL will sign the appropriate waste documentation as an agent for the OWNER.

1.03 DESCRIPTION OF MONITOR WELL WORK

A. Monitoring wells will be installed to an approximate depth of 20 feet below grade, or as determined by the **PROFESSIONAL** based on field observations. No soil sampling, for the purpose of chemical analyses, will be conducted during the well installations. The monitoring wells will be constructed of new, 2-inch diameter, schedule 40 Polyvinylchloride (PVC) risers, with 5-foot long, 10-slot schedule 40 PVC screen. The screened portion of the well will be completed by an appropriately sized filter sand pack to approximately 2 feet above the screen, followed by a 12” fine sand collar. The remaining annular space will be filled with a bentonite slurry or hydrated chips to within approximately 0.5 feet of the

ground surface. All monitoring wells will be finished tick up well casings, and the wells will be protected by installing locks and expandable locking caps.

B. The monitoring wells will be developed to remove sediments from the well casing and filter pack to enhance the flow of groundwater from the water-bearing formation to the well, using appropriate EGLE and American Society for Testing and Materials (ASTM) protocols, including water removal and surging techniques. Sufficient water will be removed from the wells until the groundwater is visually, relatively sediment-free, as determined by the **PROFESSIONAL**.

PART 2 PRODUCTS

2.01 PIPE MATERIAL

A. All piping shall be SCH 40 PVC.

B. Pipe sections will be connected using PVC screwed joints.

The Monitoring Wells shall be constructed as follows using hollow stem augers and as indicated on the Drawings.

Well No.	MW-X
Diameter/Material	2 inch / PVC (Sch. 40)
Depth	20 feet below grade
Screen Slot Size	10
Screen Length	5 feet

2.02 FILL MATERIAL

A. Filter Sand: The filter sand shall be compatible with a 10-slot screen.

B. Fine Sand Collar: A 1-foot thick fine sand collar shall be placed on top of the filter sand.

C. Bentonite Grout: The bentonite grout will consist of a mixture of bentonite powder or granules and potable water.

D. Bentonite Seal: Bentonite seal shall be made by placing bentonite chips in the borehole and hydrating. The bentonite seal shall extend from the top of the fine sand collar, to 0.5 feet from grade.

E. Granular Backfill – MDOT Class IIA sand, free of debris. To be used if insufficient native soils are available

PART 3 EXECUTION

3.01 WELL ABANDONMENT

All wells to be abandoned are illustrated on the Drawings, and shall be properly removed as directed by the PROFESSIONAL, prior to excavation/grading activities. Appendix XII includes a table with well depths. CONTRACTOR shall attempt to pull monitor well from the ground. If the well casing is pulled completely, fill hole with bentonite grout. Monitoring wells that could not be

completely removed from the ground shall be properly abandoned utilizing bentonite chips or bentonite grout to fill the entire well casing. Remove all well protective covers, manholes, concrete and castings. Cut well 2 feet below grade. Backfill and compact top 2 feet. All removed well materials, including castings, manhole covers, and stick up protective casings, shall become the property of the CONTRACTOR, and properly disposed or recycled.

3.02 MONITOR WELL INSTALLATION

The **CONTRACTOR** shall install the wells utilizing drilling techniques that conform to ASTM procedures. The **CONTRACTOR** shall perform, at a minimum, the following Work for the installation of the vertical well:

A. Cleaning/Decontamination: The **CONTRACTOR** shall pressure or steam wash all equipment and tools before and after advancement of each well.

B. Location: The location of the wells shall be as identified on the Drawings, or at the direction of the **PROFESSIONAL**.

C. Advancement: The borehole shall be advanced using hollow stem augers, with a minimum 4-1/4 inch inside diameter.

D. Maintenance of the Boring: The **CONTRACTOR** shall ensure, that during the course of drilling, no undesirable materials are spilled, dripped or introduced into the boring.

E. Filter Sand: The filter sand shall also be compatible with a 10-slot screen. The filter sand shall surround the PVC screen and pipe and extend one foot above the top of the screen.

F. Fine Sand Collar: A 1-foot thick fine sand collar shall be placed on top of the filter sand.

G. Bentonite Seal: Bentonite seal shall be made by placing bentonite chips in the borehole and hydrating. The bentonite seal shall extend from the top of the fine sand collar, to 1.5 feet from grade.

H. Monitoring wells shall be completed with lockable stick up protective casings set in 2 feet by two feet concrete pads

3.03 SURVEY

The **CONTRACTOR** shall employ a professional surveyor, registered in the State of Michigan, to survey the site to facilitate the amendment of an accurate site base map. The survey shall include the following:

A. The ground elevation and top of casing (TOC) elevation of each newly installed well. The vertical coordinates will be measured to the nearest 0.1 feet for ground elevations and 0.01 feet for TOC elevations referenced to a benchmark based on NAVD88 datum.

B. The horizontal coordinates of the wells and other pertinent Site features, including structures, piping, utilities, and roadways, will be measured relative to the State Plane coordinate system to the nearest 0.1-foot.

C. The survey shall be compatible with the existing site survey. Survey information is provided on the Drawings.

D. The survey data shall be provided to the **PROFESSIONAL** as a Microsoft file, and as an AutoCAD file.

END OF SECTION

SECTION 02370

SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 WORK REQUIRED

A. The Contractor shall furnish, install, and maintain as long as necessary and remove when no longer required, all necessary engineering controls to prevent erosion and sedimentation of onsite soils as required by, and in accordance with Part 91 of P.A. 451 and local soil erosion and sedimentation control permit.

B. The Contractor shall be responsible for all application fees and obtaining a soil erosion and sedimentation control (SESC) permit from Genesee County.

C. The Contractor shall comply with all the requirements of Michigan's Permit-By-Rule for Construction Activities for sites with over 5 acres of land disturbance. The requirements include, but are not limited to, having SESC measures under the direct supervision and control of a certified storm water operator.

1.02 RELATED SECTIONS

A. Section 02315-Excavation, Fill and Miscellaneous Materials
B. CQC/CQA Plan (Appendix IX)

1.03 REFERENCES

The following reference is part of this specification to the extent referenced.

State of Michigan

Part 91 of P.A. 451	Soil Erosion and Sedimentation Control (formerly P.A. 347)
Section 208	MDOT-Standard Specifications for Construction, 2012 Edition
DTMB	Soil Erosion and Sediment Control Guidebook, July 2019
MDOT	SESC Manual, March 2021

1.04 SUBMITTALS

A. The submittals identified in this Section shall be submitted to the Professional in accordance with Section 01330-Submittal Procedures.

B. Prior to proceeding with site work, the Contractor shall submit to the Professional a Soil Erosion and Sedimentation Control Plan, including sequencing and schedule, for approval

by the Professional. The Soil Erosion and Sedimentation Control Plan may be submitted as part of the Project Work Plan. The soil erosion and sedimentation control plan shall be in compliance with the Specifications and the provisions of Part 91 of PA 451. The cost of preparation is incidental to the project. The Plan shall include all the requirements of the State and local SESC permitting agency.

1. The Soil Erosion and Sedimentation Control Plan shall include, but not limited to, the following:

    a. Means, methods, procedures, and materials proposed for accomplishment of soil erosion and sedimentation control. The procedures shall provide a detailed description of the methods, equipment, and materials to be used and the sequence and schedule of soil erosion and sedimentation control measures to be implemented at the site.

    b. Schedule and sequence for removal of temporary and permanent soil erosion and sedimentation control measures.

2. The SESC plan shall be based on Part 91 of P.A. 451 and the cost of preparation is incidental to the project.

C. Copy of the Soil Erosion and Sedimentation Control Permit issued by the local enforcing agent. The cost of permit application is incidental to the project.

D. Copy of the certification issued by the State of Michigan – EGLE to the Contractor's Certified Storm Water Operator for the site.

PART 2 PRODUCTS

2.01 GENERAL

Materials used for permanent and temporary erosion and sedimentation controls shall meet the requirements as described in these Specifications, Drawings, DTMB's Soil Erosion and Sedimentation Control Guidebook dated July 2019 or MDOT's SESC Manual dated March 2021, MDOT 2012 Standard Specifications for Construction, and Part 91 of P.A. 451 rules.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for obtaining a Soil Erosion and Sedimentation Control permit prior to any site work.

B. The Contractor shall design and construct terrain features such as slope and drainage ways to minimize the erosion potential of the exposed site based on the soil type, time of year, proximity to water ways, duration of exposure, length and steepness of the slope, and the anticipated volume and intensity of runoff.

C. The Contractor shall minimize the surface area of unstabilized soils left unprotected and vulnerable to runoff and wind at any one time.

D. The Contractor shall minimize the amount of time that unstabilized areas are exposed to erosive forces.

E. The Contractor shall protect and shield exposed soil areas with a cover of live vegetation, mulch, or other approved erosion resistant material during the temporary and permanent control periods of construction.

F. The Contractor shall avoid concentrating runoff. When concentrated runoff cannot be avoided, runoff velocities shall be reduced to non-erosive velocities.

G. Eroded sediments will be trapped onsite with temporary and permanent barriers, basins, or other sediment retention devices while allowing for the controlled discharge of runoff waters at non-erosive velocities.

H. The Contractor shall implement a continuous inspection and maintenance program.

I. The Contractor shall implement and follow the Soil Erosion and Sedimentation Control Implementation Plan during and after the work activities, comply with the permit, and applicable rules.

END OF SECTION

SECTION 02750

ASPHALT PAVING

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. This section includes those work tasks related to the placement of hot-mix asphalt pavement, hot-mix asphalt patching, and pavement marking in accordance with the local and MDOT requirements.

B. The work includes replacement of all removed and damaged asphalt paved areas in kind or better.

1.3 DEFINITION

A. MDOT: Michigan Department of Transportation

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Job-Mix Designs: For each job mix proposed for the Work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified manufacturer and Installer. All asphalt mixes shall be produced in an MDOT approved plant.

B. Material Certificates: For each paving material.

C. Material Test Reports: For each paving material, by a qualified testing agency.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: All asphalt mixes shall be produced in an MDOT approved plant.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the current MDOT Standard Specifications for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.9 FIELD 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 Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242/D 242M, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. All materials shall conform to applicable requirements of the current MDOT Standard Specifications.

B. Tack Coat: rapid-curv liquid asphalt conforming to MDOT Standard Specifications.

C. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade No. 2 or No. 3.

C. Joint Sealant: ASTM D 6690, Type I, II or III, hot-applied, single-component, polymer-modified bituminous sealant.

D. Pavement-Marking Paint: All pavement marking materials shall be in accordance with MDOT Standard Specifications for epoxy paint.
1. Color: As indicated.

2.4 MIXES

A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

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.

D. Placing Patch Material: 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 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. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth (0.5 to 1.40 L/sq. m per 25 mm depth). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

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.

3.4 PLACING HOT-MIX ASPHALT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in 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 in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches (25 to 38 mm) from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base course before placing asphalt surface course.

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.

3.5 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 (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations.".
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.

3.6 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 (85 deg C).

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: 96 percent of reference laboratory density according to ASTM D 6927, but not less than 94 percent or greater than 100 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. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 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 (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), 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 (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch (6 mm).
2. Surface Course: 1/8 inch (3 mm).

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Subcontractor will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. 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.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three cores taken.
    b. 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.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 WASTE HANDLING

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in a State-approved landfill.

1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION 02950

SITE RESTORATION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Compact the site surface and finish the grade as described in this section and the contract documents. All impacted areas by site activities, including pavements, roads, vegetation, monitoring wells, and all other disturbed or altered structures/features shall be restored to pre-work condition.

B. The **CONTRACTOR** shall seed and establish turf at the areas identified on the Drawings and as directed by the **ENGINEER**

1.02 REFERENCES

A. MDOT-Soil Erosion and Sediment Control Manual, March 2021

B. Federal Interagency Stream Restoration Working Group, Stream Corridor Restoration Principles, Process, and Practices, GPO No. 0120-A, Rev. 2000

C. Michigan Department of Environmental Quality, Guidebook of Best Management Practices for Michigan Watersheds

D. U.S. Army Corps of Engineers (USACE), Hydraulic Design of Flood Control Channels (EM-1110-2-1601), 1991

E. MDOT 2012 Specifications for Construction

1.03 SUBMITTALS

A. The Contractor shall fully describe the means, procedures, and materials to be used to restore the site to its pre-existing condition in the Project Work Plan, in accordance with Section 01330-Submittal Procedures.

B. The Contractor shall provide the following restoration materials data to the Professional. The Professional must approve the materials before the materials are delivered to the site.

1. Fill Sand: grain size distribution and the source of fill materials that meets the Michigan Department of Transportation (MDOT) Class IIA requirements, including certification and/or laboratory data indicating that the material is non-contaminated.

2. Construction materials for monitoring wells, if necessary, to verify that monitoring wells are repaired and/or replaced to original construction and condition.

3. Submit for review: All mulch blanket manufacturer's specifications, and seed supplier's

certified analyses of the seed.

C. Weigh Scale:

1. The Contractor shall provide the copies of calibration certification of all weigh scales and copies of weigh tickets including location, date, and time of weighing, measured weights, vehicle and container identification, and shipment identification number.

2. All vehicles shall be weighed before and after loading at a state-certified weigh scale facility, as directed by the Professional. Weighing shall be conducted to allow calculation of the loaded material weight to the satisfaction of the Professional.

3. Deliver written weigh scale receipts/delivery tickets to the Professional at the end of each day that material is shipped to the site and upon request.

PART 2 PRODUCTS

2.01 MATERIALS

A. Clean Fill: Clean fill shall meet MDOT Class IIA gradation.

B. Aggregates: Aggregates used shall meet MDOT 22A graduation.

C. Mulch Blankets shall be excelsior or straw, in accordance with Section 917.15 (B.2) of the MDOT's 2012 Standard Specifications for Construction. All mulch shall be subject to the approval of the Engineer. Mulch Blankets shall be used for all turf establishment areas, where high velocity much blankets are not indicated.

D. High Velocity Mulch Blankets shall be excelsior or straw, in accordance with Section 917.15 (B.1) of the MDOT's 2012 Standard Specifications for Construction. All mulch shall be subject to the approval of the Engineer. High Velocity Mulch Blankets shall be used for all turf establishment areas where grades are 1 vertical to 4 horizontal (1V:4H) slopes or steeper: and as shown on the Drawings.

E. Top Soil: Topsoil shall be the top 6 inches or less of soil taken from the top of the natural and undisturbed ground level and shall be a loam containing a sufficient amount of organic matter to be of proper texture. Topsoil containing undesirable grasses, weed roots or other unsuitable materials will not be acceptable. Top soil shall also be in accordance with Section 917.07 of the MDOT's 2012 Standard Specifications for Construction All topsoil shall be subject to the approval of the Engineer. Contractor shall provide top soil sample to the Profession for visual inspection and approval, prior to the transport to the site. Top soil shall be free of stones, stumps, lumps and similar objects larger than 2-inches in diameter, and shall, at a minimum, meet the following requirements:

1. Must be free of contaminants.
2. Must not be excessively acidic or excessively alkaline.
3. Must not contain natural underlying soils, subbase materials, or other unsuitable

material.

4. Must consist of natural loam or sandy loam soils adapted to sustain plant life.

F. Asphalt and Concrete: Asphalt and concrete materials shall be in accordance with MDOT 2012 Standard Specifications for Construction and these specifications.

PART 3 EXECUTION

3.01 TIME OF RESTORATION

No restoration shall be performed in any area of the site until the Professional determines that site activities in that area are complete.

3.02 SURFACE GRADE

A. After excavation and backfilling activities have been completed, all disturbed surfaces shall be rough graded, prior to surface restoration, so as to leave no ruts, pits, piles, or ridges. If fill is required, the Contractor shall be responsible for settlement of fill over any fill areas and shall be required to repair any voids or holes that appear for a period of one year after final acceptance of work by the PROFESSIONAL, at the CONTRACTOR'S own expense. The cost for fill for surface grading is incidental to the project.

3.03 FINISH GRADE

A. Finish grade shall match the proposed final contours where earth changes are proposed. Other areas not requiring grading/re-shaping shall be brought back to pre-work grades. Grading shall be conducted as directed by the OWNER/PROFESSIONAL.

B. All impacted areas by site activities, including pavements, roads, vegetation, and all other disturbed or altered structures/features shall be restored to pre-work condition.

3.04 SURFACE RESTORATION

A. Saw cut all edges of the existing pavement. Place aggregates and geotextiles as indicated on the Drawings, and compact and prepare surface for placement of asphalt. Place asphalt in accordance with MDOT standard specifications and the Drawings.

B. The Contractor shall place and compact minimum 6-inch (and no less than the preexisting thickness) thick MDOT 22A aggregate material where gravel was present.

3.05 MONITORING WELLS

A. The Contractor is required to repair, to original condition, any monitoring wells damaged or removed that are outside the excavations as a result of the Contractor's work, at no additional cost to the Owner.

3.06 SITE CLEANING AND DISPOSAL

A. See Section 01740-Cleaning

3.07 TURF ESTABLISHMENT

A. All seed, mulch, topsoil and fertilizer activities shall be performed in accordance with MDOT standards; refer to Section 8.16, Turf Establish, of MDOT's 2012 Standard Specifications for Construction for direction. All activities shall be subject to the approval of the **ENGINEER**.

3.08 TURF PROTECTION, MAINTENANCE AND REPAIR

A. The newly established turf areas shall be protected, maintained and repaired during the Work and one year after Substantial Completion until it is accepted by the Owner. A growing turf shall be established for a period of at least 30 days (Turf Establishment Period), which may include the time after Substantial Completion, and prior to payment for this item.

B. Inspect weekly and within 24 hours following each rain event in the first two months of seeding to be sure seed has germinated and permanent vegetative is established. Add supplement seed, topsoil, and mulch as necessary.

3.09 FINISHING GRADE

A. Finish grade all disturbed areas to blend with the surface of adjacent undisturbed areas.

B. Settlement or washing/erosion that occurs in disturbed, prior to acceptance of the work, including the Turf Establishment Period, shall be repaired (including re-seeding, mulching and top soiling) and grades re-established to the required elevation slopes at no additional cost to the **OWNER**. All repairs are subject to a new Turf Establishment Period.

END OF SECTION

Division 03

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Repair or replace at grade concrete slabs, sidewalks, and curb and gutter removed or damaged during site activities.

B. All concrete repairs and replacements shall match, at a minimum, the pre-existing condition or better, and shall comply with all current City, County, and MDOT requirements.

1.02 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.03 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. If additional water is to be added to the concrete at the Site, indicate amounts of mix water to be initially withheld for later addition at the Site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI315, “Details and Detailing of Concrete Reinforcement.” Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for floor sump, manhole and openings through concrete structures.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete

Association foots Certification of Ready Mixed Concrete Production Facilities.

C. Testing Agency Qualifications: An independent testing agency, acceptable to Professional, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Avoid damaging coatings on steel reinforcement.

2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963 M.

1.06 JOB CONDITIONS

A. COLD WEATHER REQUIREMENTS

1. Do not place concrete, without the Professional's approval, when the ambient air temperature is below 45°F.

2. The reinforcing, forms, and ground, that will be in contact with the concrete, shall be free of frost and above 32°F prior to concrete placement.

3. When the ambient air temperature is below 40°F, all concrete placed in forms shall have a temperature of 50°F to 80°F.

4. When the ambient air temperature is 50°F or below, provide a means to maintain the concrete at the minimum required curing temperature throughout the curing period.

5. Gradually reduce the concrete temperature at the end of the curing period to that of ambient air, using a rate not to exceed 40°F in 24 hours.

6. Discontinue wetting sufficiently, in advance of heat reduction, to prevent water from freezing on the surface of the concrete.

7. Do not use calcium chloride, salt, or other chemicals to prevent freezing.

PART 2 PRODUCTS

2.01 FORM-FACING MATERIALS

A. Rough-Formed Finish Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Steel Welded Wire/Fabric: ASTM A 185, 6 x 6 – W2.9 x W2.9

2.03 CONCRETE MATERIALS

A. Cement: Standard Portland Cement, ASTM C 150, Type I and Type II

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Class: Moderate weathering region, but not less than 3M
2. Nominal Maximum Aggregate Size: 1 inch (25 mm)
3. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 % and not less than 8 % retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 (0.3-mm) sieve, and less than 8 % may be retained on sieves finer than No. 50 (0.3 mm).

C. Lightweight Aggregate: ASTM C 330.

1. Nominal Maximum Aggregate Size: 1 inch (25 mm)

D. Water: Potable and complying with ASTM C 94

E. Water Reducing Admixture

1. Type: ASTM C 494-86, Type A, maximum 1% chloride ions.
2. Manufacturer: "Eucon WR by the Euclid Chemical Company, "Pozzolith 122N" by Master Builders, or "Plastocrete 161" by SIKA Chemical Corp.

2.04 CONCRETE MIXES

A. Concrete Footings, Slabs on Grade, Sidewalks, and Curb and Gutter: MDOT Mix P1, 3500 psi at 28 days, maximum slump 3 inches, air 6.5% (1.5% +/-).

2.05 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 90 to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Job-Site Mixed Concrete: Job-Site mixed concrete may be used in accordance with the ASTM C94, providing the materials, storage of materials, batching, and mixing equipment meet the approval of the Professional.

C. Refer to 2012 MDOT Standard Specifications for Construction.

PART 3 EXECUTION

3.01 PREPARATION

A. Compact aggregate base to 95% of the maximum unit weight, prior to placing concrete. Comply with section 602.03 B of 2012 MDOT Standard Specifications for Construction.

B. Contractor shall survey the site on a 10-foot grid prior to work at the site. Elevations shall be accurate to 0.01 foot. All pavement types and curb and gutter elevations and locations shall be recorded. The survey area shall include, but is not limited to, the area of proposed pavement and curb and gutter. The intent of the survey is to record current drainage flow patterns, topography, and existing pavement limits, which will be utilized during the construction of new concrete pavement and curb and gutter. The survey shall be illustrated on a 1 inch = 30 foot scale drawing.

3.02 GENERAL

A. Design, erect, shore, brace, and maintain formwork, according to 2012 MDOT Standard Specifications for Construction. Elevations of new pavement shall match the existing pavement elevations. Concrete surfaces shall be constructed to provide positive drainage.

B. Placement, curing, joint construction, surface texturing, base preparation, reinforcement placement, weather limitations and all other related construction techniques/specifications for concrete shall be in accordance with 2012 MDOT Standard Specifications for Construction.

C. Do not add water to concrete during delivery, at the site, or during placement, unless approved by Professional.

D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

E. Concrete slabs or grade shall be textured according to Section 602.03 K in MDOT Standard Specifications for Construction. Curb and gutter shall be constructed with a smooth surface.

F. Slab and curb and gutter joints shall be in accordance with 2012 MDOT Standard Plans and the drawings included in the contract documents.

G. Spacing for joints in slabs on grade shall be 10 foot by 10 foot maximum. Joint type shall be symbol B per MDOT Standard Plan R-41-D. Slabs on grade shall be 6 inch minimum thickness, MDOT P1 grade concrete, with reinforcement, unless noted otherwise on the drawings.

H. Curb and gutter shall be detail D2 per MDOT Standard Plan R-30-D, modified to match existing curb profile.

3.03 CONCRETE REMOVAL AND RESTORATION

A. Saw cut existing concrete at right angles or remove at existing joists, provided there exists no reinforcement in the concrete.

B. Dowel-tie replacement concrete with existing concrete pavement.

C. Properly dispose of removed concrete.

END OF SECTION

Drawings

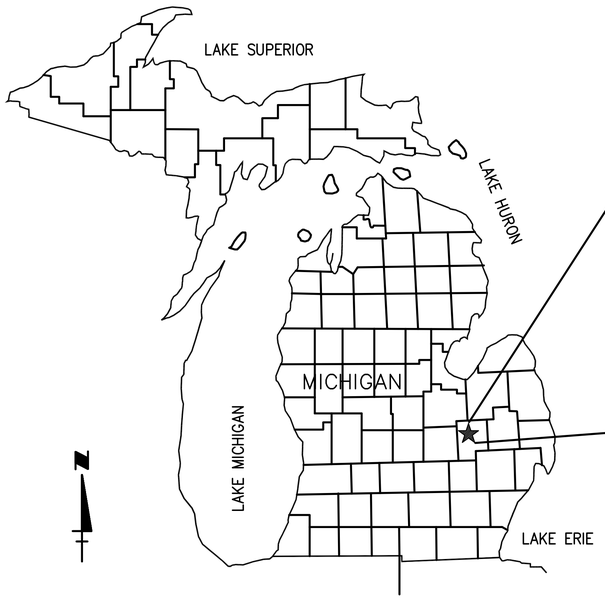
MICHIGAN DEPARTMENT OF ENVIRONMENT
GREAT LAKES AND ENERGY -
REMEDIATION AND REDEVELOPMENT DIVISION

CITY OF FLINT
LANDFILL CLOSURE (CAP) AT FLINT BISHOP AIRPORT
FINAL

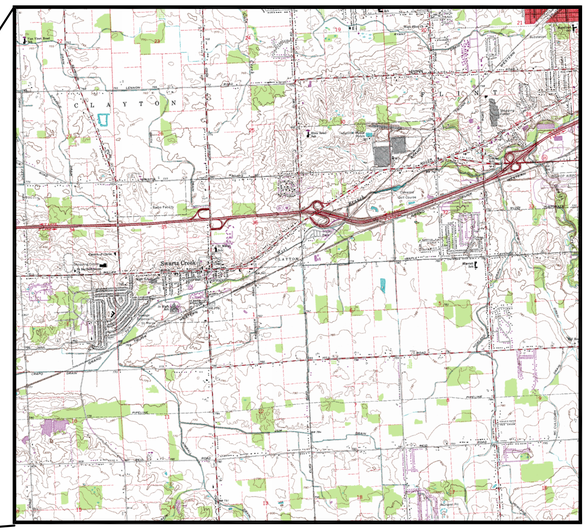
INDEX OF DRAWINGS

MEDQ CONTACT: TBD

AIRPORT CONTACT: TBD



SITE MAP



GENESEE COUNTY
N.T.S.

NO.	DESCRIPTION	DATE	BY

REVISIONS

DLZ
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SURVEYING • CONSTRUCTION SERVICES

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENGERY (EGLE) – REMEDIATION AND REDEVELOPEMENT DIVISION

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

TITLE AND INDEX

DRAWN	ISM	PROJECT NO.	2341765001
DESIGNED	ISM	DATE	01/11/2019
CHECKED	SL	SCALE	NONE
APPROVED	SL	SHEET	1 OF 14
FILE NO.			

GENERAL NOTES:

1. COORDINATE SYSTEM IS BASED ON SURVEY PROVIDED BY DLZ
2. SEDIMENTATION AND EROSION CONTROLS SHALL BE PLACED AND MAINTAINED AS SHOWN ON THE PLANS AND AS SPECIFIED BY SOIL EROSION AND SEDIMENTATION CONTROL PERMIT.
3. DUST CONTROL SHALL BE PROVIDED BY THE APPLICATION OF WATER OR OTHER APPROVED MATERIALS TO UNPAVED ROAD SURFACES AND ALL DISTURBED AREAS. PAVED ROADS SHALL BE KEPT CLEAN BY SWEEPERS. REFER TO CQC/CQA PLAN FOR ADDITIONAL DETAIL
4. CONTRACTOR SHALL PROVIDE AND MAINTAIN A DECONTAMINATION AND TRUCK WASH AREA THROUGHOUT THE PROJECT.
5. SOIL, EQUIPMENT AND MATERIAL STORAGE AREAS SHALL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.
6. NOTES AND LEGENDS ON THIS SHEET ARE APPLICABLE TO ALL SHEETS. ADDITIONAL NOTES AND LEGENDS ON OTHER SHEETS REFER TO THAT INDIVIDUAL SHEET UNLESS OTHERWISE STATED.
7. IF LEACHATE OR POTENTIALLY HAZARDOUS MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, CONTRACTOR SHALL NOTIFY THE ENGINEER.
8. CONTRACTOR SHALL PROVIDE A DETAILED WORK PLAN AND PHASING PLAN AS NOTED IN THE DRAWINGS AND SPECIFICATIONS
9. CONTRACTOR SHALL ABANDON MONITORING WELLS IN ACCORDANCE WITH SPECIFICATIONS AND AS NOTED ON SHEET 3
10. CONTRACTOR SHALL PROTECT ALL MONITORING WELLS OTHER THAN THE ONES TO BE ABANDONED.
11. CONTRACTOR SHALL PROVIDE SEDIMENT CONTAINMENT FENCE ALONG THE ENTIRE PERIMETER OF THE CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH DETAILS SHOWN ON THE SPECIFICATIONS AND AS NOTED ON SHEET 14
12. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE AIRPORT PERSONNEL. CONTRACTOR SHALL COOPERATE AND COORDINATE ALL SITE ACTIVITIES WITH AIRPORT PERSONNEL.
13. REFER TO PROJECT SPECIFICATIONS AND CQC/CQA PLAN FOR ADDITIONAL DETAIL ON THE CONSTRUCTION OF THE CAP.

UTILITIES

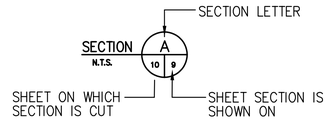
ELECTRIC: CONSUMERS POWER CO.
TEL. NO. (800)-805-0490

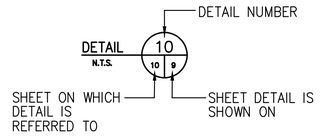
RAILROAD: CANADIAN NATIONAL
TEL. NO. (888)-888-5909

LEGEND

- GAS VENT
- MONITORING WELL
- CULVERTS
- POWER POLE
- SECTION CORNER
- PROPERTY BOUNDARY
- BENCH MARK
- TREE LINE
- EDGE OF WATER
- IRON PIPE
- SWAMP
- 880 CONTOUR ELEVATION
- × 859.5 SPOT ELEVATION
- OBJECTS
- TREE
- EXISTING FENCE
- PROPOSED TEMPORARY FENCE
- PROPOSED PERMANENT FENCE

SECTIONS AND DETAILS IDENTIFICATION SYSTEM





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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

GENERAL NOTES AND LEGEND

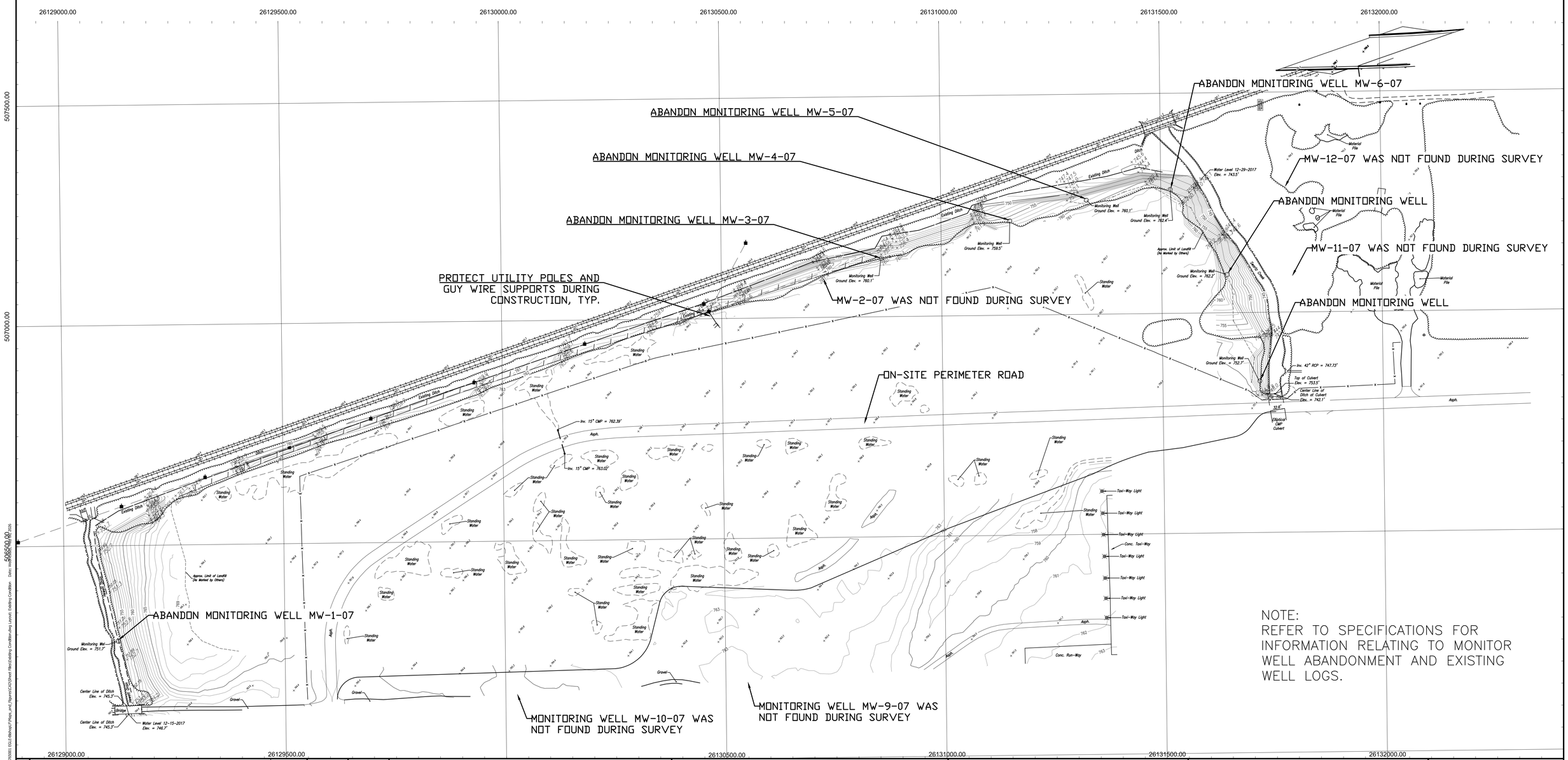
SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 2 **OF** 14

CONTROL POINTS

CONTROL POINTS			
KEY	NORTHING	EASTING	ELEVATION
51	535859.299	13283683.940	765.12
52	536209.578	13283579.260	766.01
53	536445.031	13283961.930	764.17
54	536570.032	13284392.420	763.41
55	536745.812	13284937.560	764.29
56	536861.154	13285509.660	763.67
57	536757.136	13285932.790	761.91
58	536620.578	13286084.760	754.42

Surveyor's Notes:

1. The topographic information shown on this plat was obtained by aerial LiDAR methods supplemented by ground survey. Only improvements which were visible from above ground at the time of survey and through a normal search and walk through of the site are shown. At the time of the ground survey, the site was covered by snow.
2. LiDAR information obtained: November 20, 2017.
3. Last Date of Fieldwork: December 29, 2017.
4. This drawing is referenced to the Michigan State Plane Coordinate System of 1983, South Zone and the North American Vertical Datum of 1988 as derived from the Michigan Department of Transportation Continuously Operating Reference System (MDOT CORS). Units are International Feet.
5. Aerial topography flown by Aerocon: November 20, 2017.



NOTE:
REFER TO SPECIFICATIONS FOR INFORMATION RELATING TO MONITOR WELL ABANDONMENT AND EXISTING WELL LOGS.

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CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

EXISTING CONDITIONS

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 3 **OF** 14

File Name: X:\Projects\2023\2341\00001 EGL\Milford Ph Proj. and Reports\CAD\Sheet files\Existing Conditions.dwg Layout: Existing Condition Date: 1/26/2024 10:26

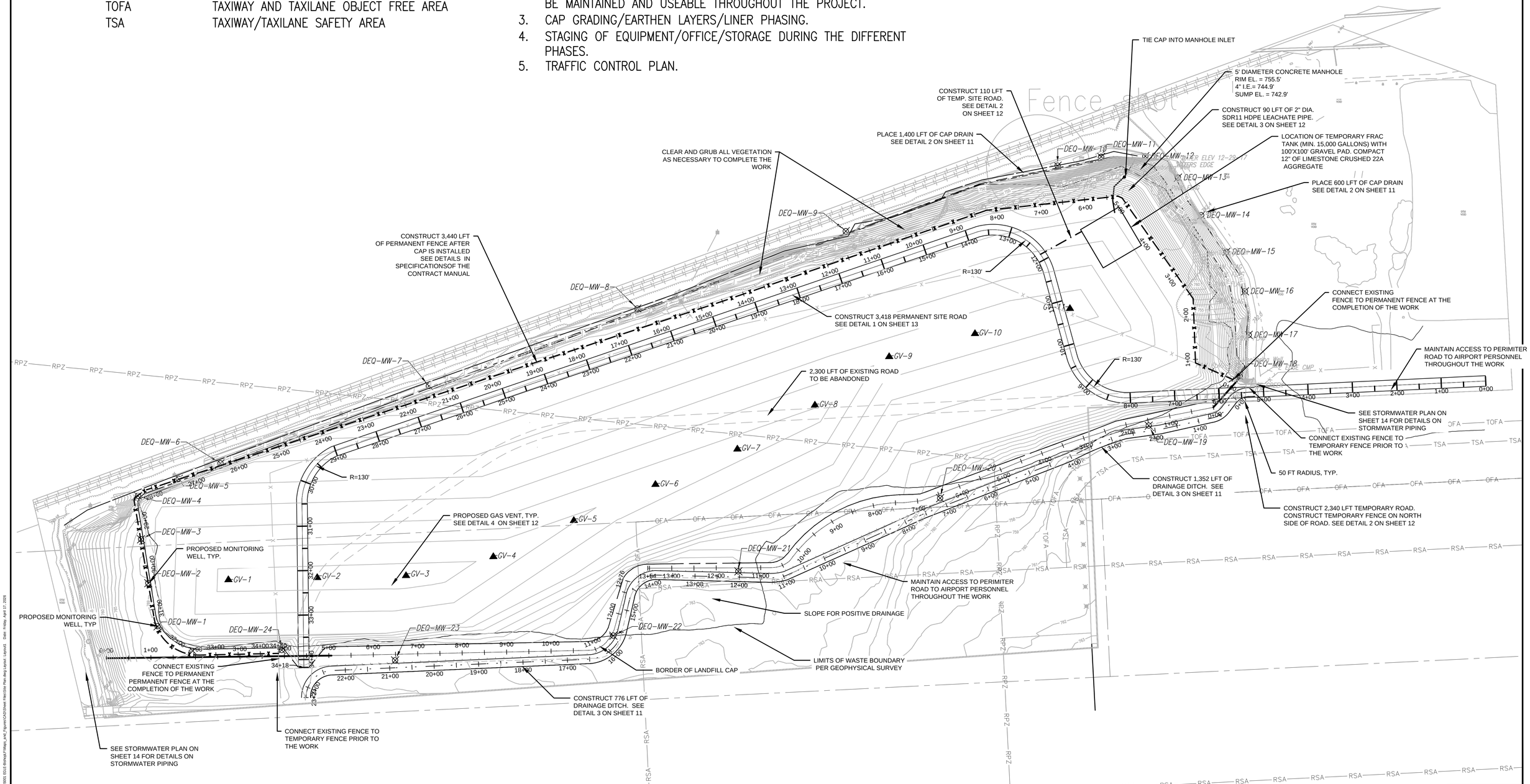
LEGEND

DEQ–MW–#	PROPOSED MONITORING WELL
GV–#	PROPOSED GAS VENT
B/D	BOTTOM OF DITCH ELEVATION
RPZ	RUNWAY PROTECTION ZONE
RSA	RUNWAY SAFETY AREA
OFA	OBJECT FREE AREA
TOFA	TAXIWAY AND TAXILANE OBJECT FREE AREA
TSA	TAXIWAY/TAXILANE SAFETY AREA

PHASING PLAN

CONTRACTOR SHALL SUBMIT A PHASING PLAN TO THE ENGINEER FOR APPROVAL. THE PLAN SHALL ADDRESS, AT A MINIMUM, THE FOLLOWING:

1. PLANNED SEQUENCE OF ALL EVENTS/CONSTRUCTION, INCLUDING DATES AND DURATIONS.
2. HOW THE ON SITE ROAD, USED BY AIRPORT PERSONNEL, WILL BE MAINTAINED AND USEABLE THROUGHOUT THE PROJECT.
3. CAP GRADING/EARTHEN LAYERS/LINER PHASING.
4. STAGING OF EQUIPMENT/OFFICE/STORAGE DURING THE DIFFERENT PHASES.
5. TRAFFIC CONTROL PLAN.



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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

SITE PLAN

SCALE: 1"=100'
PROJECT NO. 2341–7650–01
SHEET NO. 4 OF 14

PROPOSED MONITORING WELL COORDINATES

IMPROVEMENT COORDINATE SCHEDULE			
KEY	NORTHING	EASTING	DESCRIPTION
24	536059.854	13283665.691	DEQ-MW-1
25	536157.281	13283645.979	DEQ-MW-2
26	536256.143	13283630.931	DEQ-MW-3
27	536353.662	13283625.340	DEQ-MW-4
28	536391.146	13283717.262	DEQ-MW-5
29	536424.884	13283811.398	DEQ-MW-6
34	536593.577	13284282.082	DEQ-MW-7
39	536762.269	13284752.765	DEQ-MW-8
44	536930.961	13285223.449	DEQ-MW-9
49	537072.800	13285701.481	DEQ-MW-10
50	537091.696	13285799.679	DEQ-MW-11
51	537091.780	13285898.948	DEQ-MW-12
52	537042.886	13285971.843	DEQ-MW-13
53	536957.682	13286023.174	DEQ-MW-14
54	536874.611	13286078.838	DEQ-MW-15
55	536785.286	13286119.451	DEQ-MW-16
56	536687.115	13286126.766	DEQ-MW-17
57	536594.587	13286105.365	DEQ-MW-18
58	536027.052	13284690.365	DEQ-MW-22
64	535977.080	13284198.986	DEQ-MW-23
67	536168.393	13284973.035	DEQ-MW-21
73	536327.836	13285428.637	DEQ-MW-20
77	536485.636	13285899.608	DEQ-MW-19
81	536003.260	13283944.213	DEQ-MW-24

LANDFILL VENT COORDINATES

IMPROVEMENT COORDINATE SCHEDULE			
KEY	NORTHING	EASTING	DESCRIPTION
8	536162.849	13283826.343	GV-1
9	536165.624	13284026.393	GV-2
10	536166.934	13284226.389	GV-3
11	536207.947	13284422.139	GV-4
12	536287.823	13284605.496	GV-5
13	536366.147	13284789.521	GV-6
14	536443.968	13284973.760	GV-7
15	536539.687	13285149.367	GV-8
16	536646.032	13285318.750	GV-9
17	536696.753	13285512.212	GV-10
18	536751.009	13285725.416	GV-11

EXISTING MONITORING WELL COORDINATES

MONITORING WELL COORDINATES			
KEY	NORTHING	EASTING	DESCRIPTION
5114	536896.146	13285242.330	PGMW
5132	536981.857	13285534.380	PGMW
5167	537028.823	13285708.270	PGMW
5169	537053.364	13285898.560	PGMW
5190	536860.017	13286028.080	PGMW
5211	536618.604	13286102.520	PGMW

CONTROL POINT COORDINATES

CONTROL POINTS			
KEY	NORTHING	EASTING	ELEVATION
51	535859.299	13283683.940	765.12
52	536209.578	13283579.260	766.01
53	536445.031	13283961.930	764.17
54	536570.032	13284392.420	763.41
55	536745.812	13284937.560	764.29
56	536861.154	13285509.660	763.67
57	536757.136	13285932.790	761.91
58	536620.578	13286084.760	754.42

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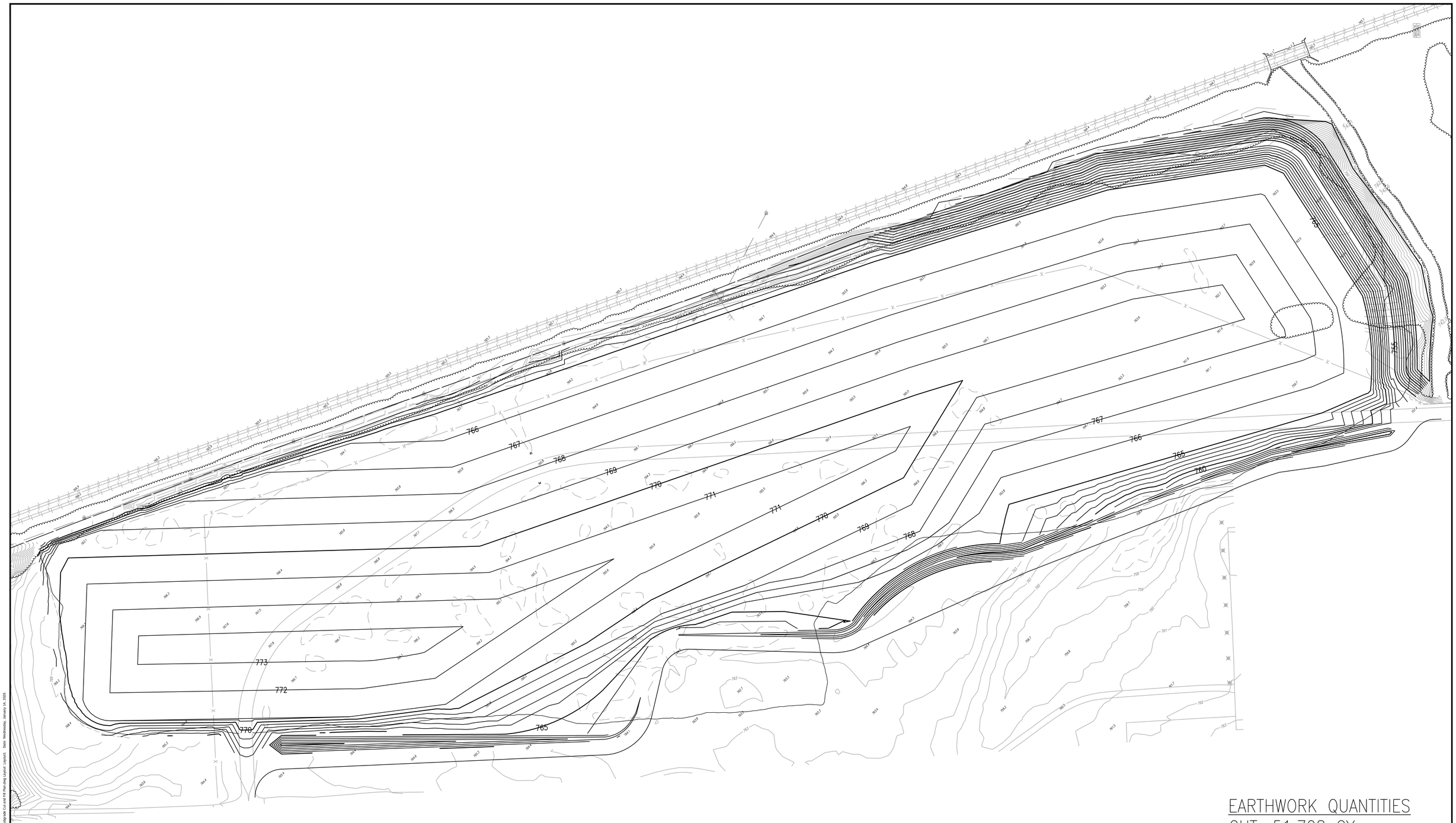
ENVIRONMENT, GREAT LAKES AND ENERGY

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

SITE PLAN – COORDINATES

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 5 **OF** 14



EARTHWORK QUANTITIES
CUT: 51,708 CY
FILL: 52,968 CY

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CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

SUBGRADE CUT AND FILL PLAN

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 6 **OF** 14

File Name: X:\Projects\2023\2341\7650\01 EGLE-Bishop\FAMaps_and_Figures\CAD\Sheet Files\Subgrade Cut and Fill Plan.dwg Layout: Layout1 Date: Wednesday, January 14, 2026

0.5% SLOPE TO CULVERT, TYP

HIGH POINT OF ROAD DITCH

CROWN OF ROADWAY NOT SHOWN FOR CLARITY OF CAP CONTOURS

PROPOSED ROAD

25% MAX SLOPE

2% TYPICAL EACH SIDE OF PEAK

2% TYPICAL EACH SIDE OF PEAK

6% MAX SLOPE

6% MAX SLOPE

P.O.E.: 8+36.31

LIMITS OF WASTE BOUNDARY PER GEOPHYSICAL SURVEY

BORDER OF LANDFILL CAP

A 7 | 8

B 7 | 8

C 7 | 9

D 5 | 10

773.51

773.53

773.51

769.79

769.80

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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

FINAL CONTOURS

SCALE: 1" = 1' 0"

PROJECT NO. 2341-7650-01

SHEET NO. 7 OF 14

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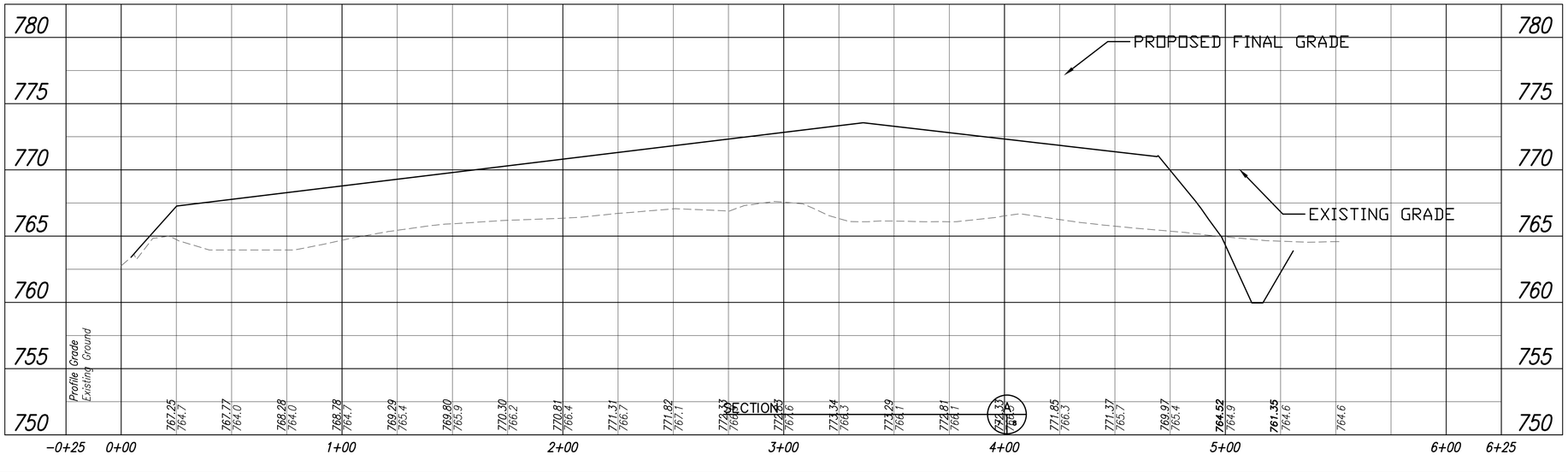

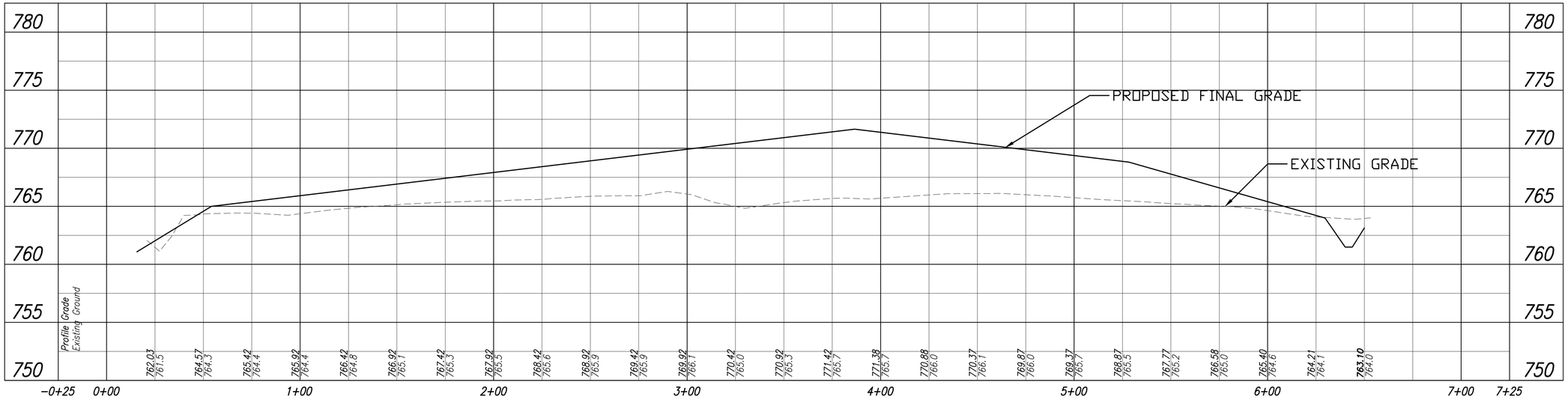

SECTION B (7 | 8)

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MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY

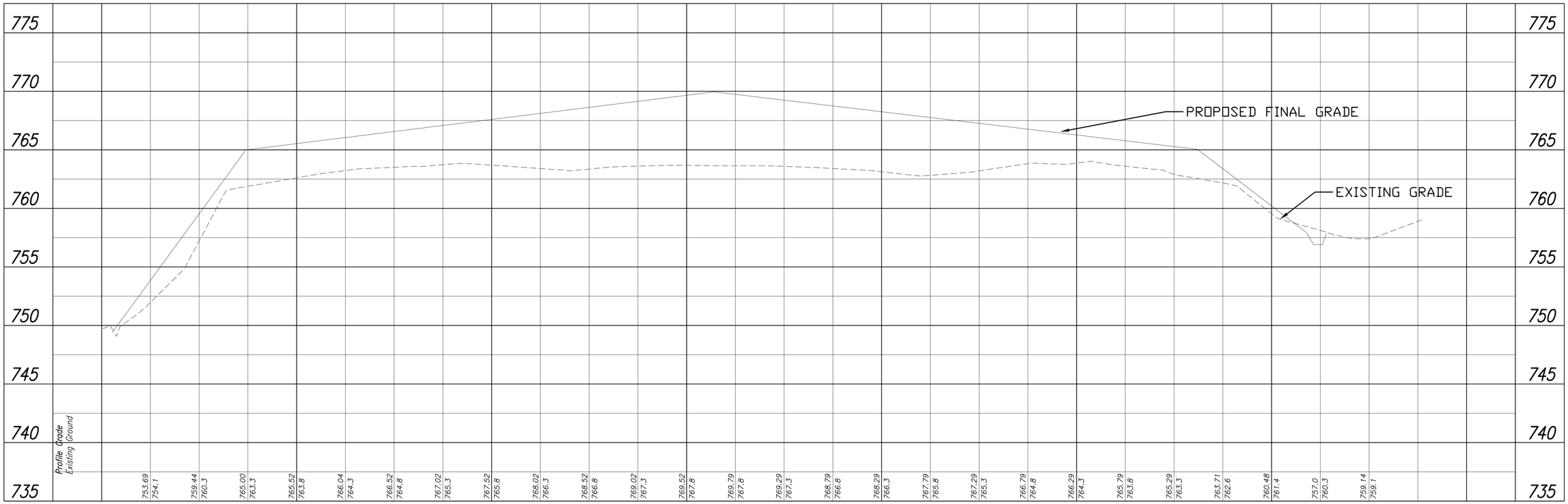
CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

LANDFILL SECTIONS A & B

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 8 **OF** 14

MONITORING WELL COORDINATES

KEY	NORTHING	EASTING	DESCRIPTION
5114	536896.146	13285242.330	PGMW
5132	536981.857	13285534.380	PGMW
5167	537028.823	13285708.270	PGMW
5169	537053.364	13285898.560	PGMW
5190	536860.017	13286028.080	PGMW
5211	536618.604	13286102.520	PGMW



SECTION C 7 | 10

REVISIONS				

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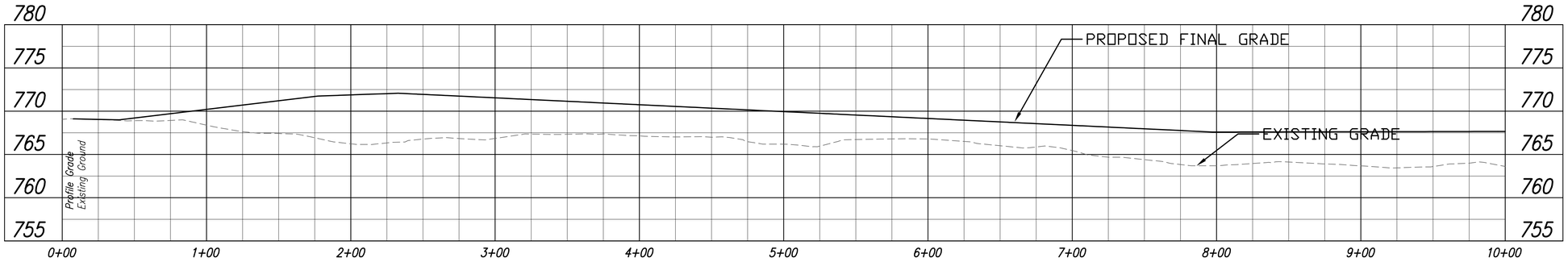
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY

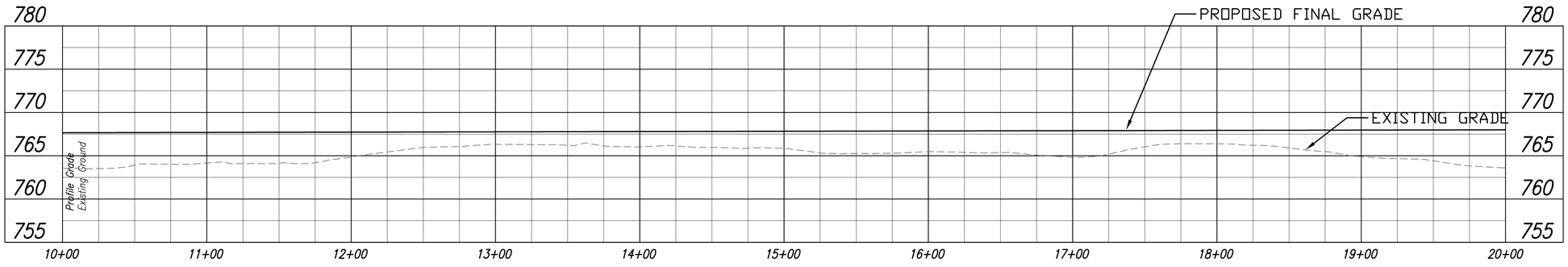
CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

LANDFILL SECTION C

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 10 **OF** 14



SECTION D 7 10



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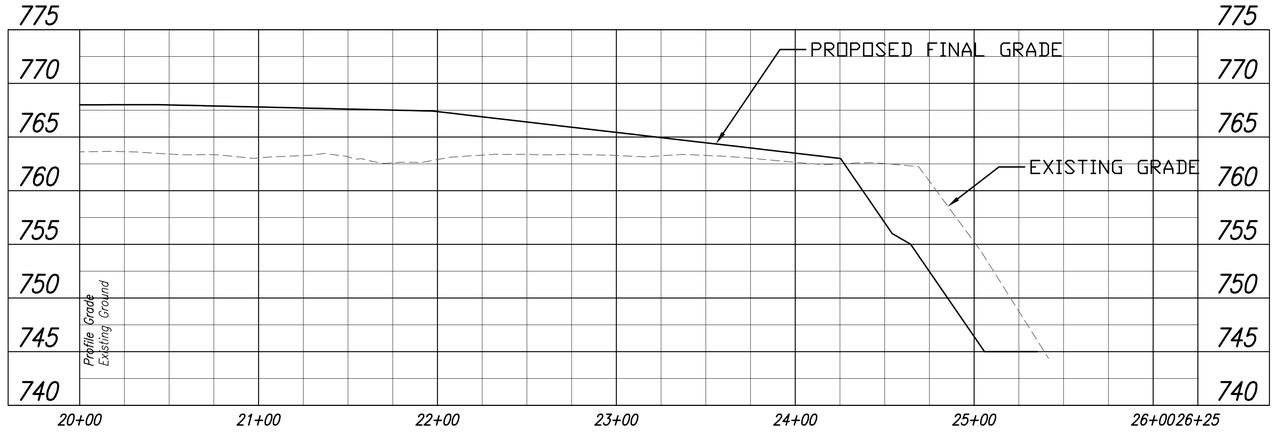

SECTION D 7 10

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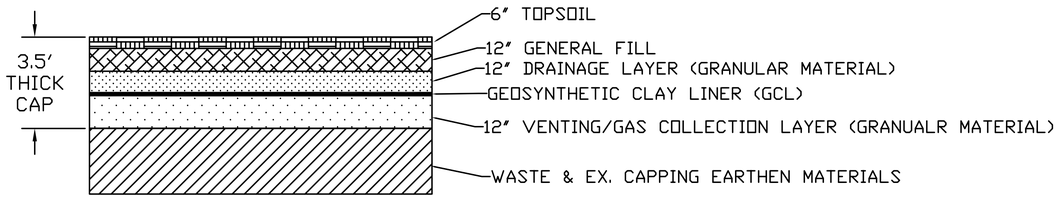
MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES AND ENERGY

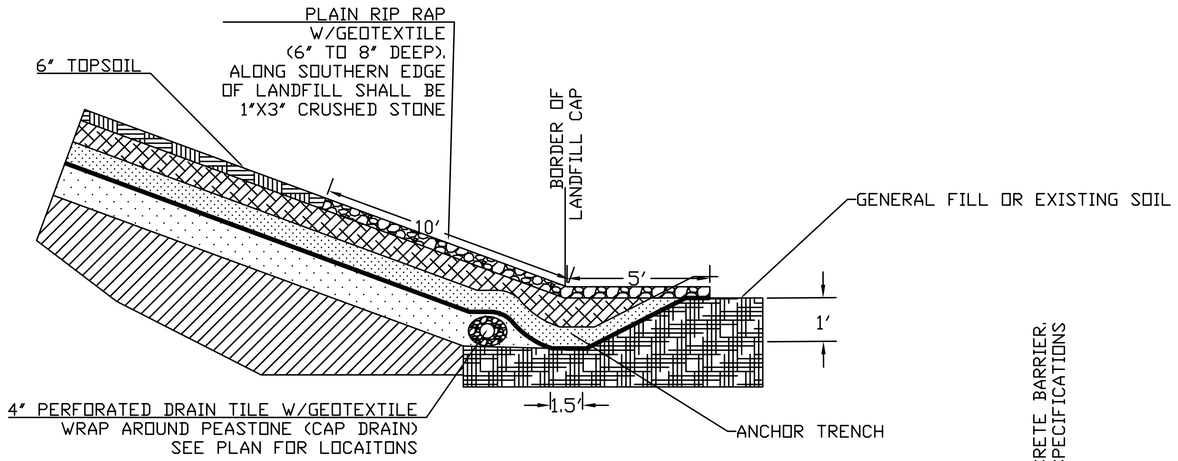
CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

LANDFILL SECTION D

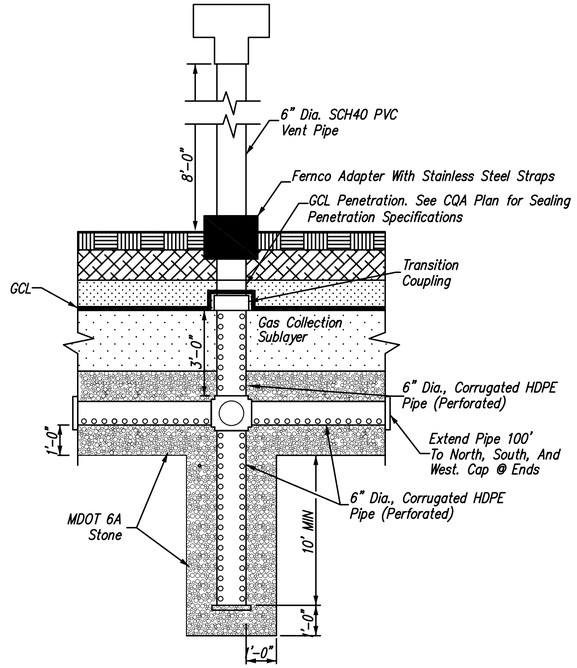
SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 10 **OF** 14



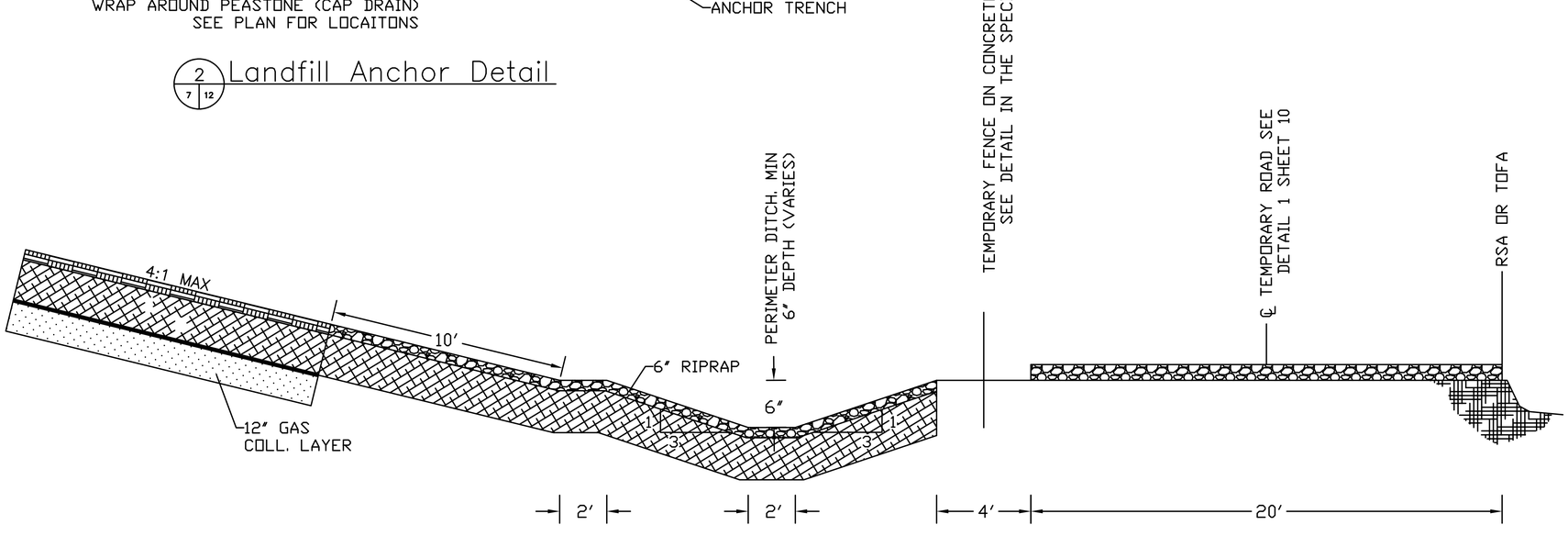
1 / 7 | 12 Landfill Cap Section



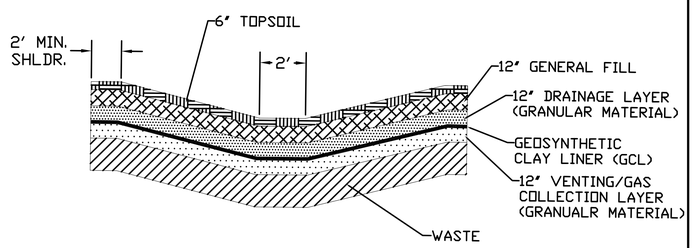
2 / 7 | 12 Landfill Anchor Detail



4 / 4 | 12 Passive Landfill Gas Vent Detail



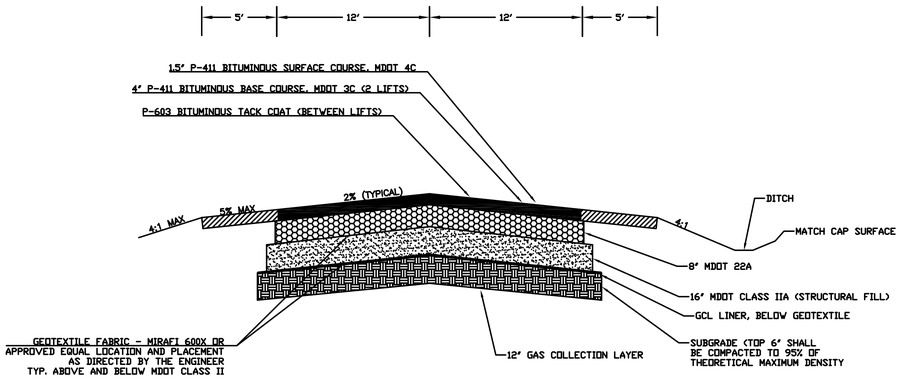
3 / 7 | 12 South Perimeter Ditch, Fence, and Temporary Road Detail



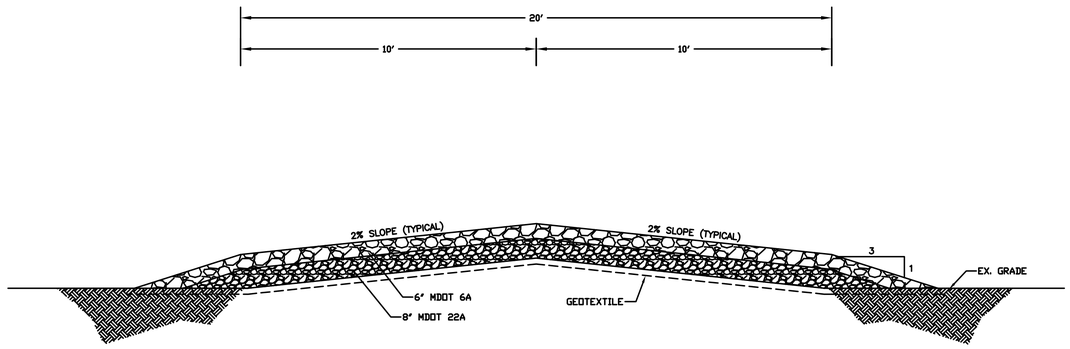
Swale Detail

REVISIONS							
				DLZ ARCHITECTURE • ENGINEERING • PLANNING SURVEYING • CONSTRUCTION SERVICES	MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY	CITY OF FLINT LANDFILL CLOSURE (CAP) AT FLINT BISHOP AIRPORT	FINAL COVER DETAILS

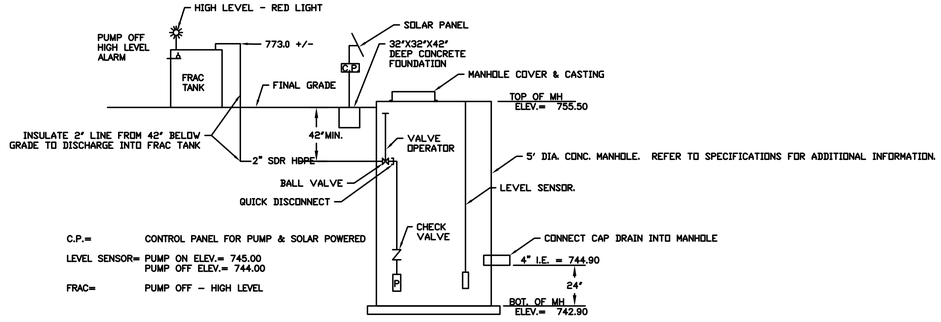
SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 12 OF 14



1 / 4 / 13 TYPICAL PERMANENT ROAD SECTION



2 / 4 / 13 TEMPORARY ROAD X-SECTION



3 / 4 / 15 SCHEMATIC FOR LEACHATE PUMPING SYSTEM

NOTE:
SEE CONTRACT DOCUMENTS FOR ADDITIONAL DETAILS (I.E. MANHOLE, CULVERTS, FENCING)

REVISIONS				DLZ ARCHITECTURE • ENGINEERING • PLANNING SURVEYING • CONSTRUCTION SERVICES	MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY	CITY OF FLINT LANDFILL CLOSURE (CAP) AT FLINT BISHOP AIRPORT	ROAD AND LEACHATE SYSTEM DETAILS	SCALE: AS SHOWN PROJECT NO. 2341-7650-01 SHEET NO. 13 OF 14

CONSTRUCTION NOTES:
1. GRUB VEGETATION/ROOTS RESHAPE AREA PRIOR TO GRADING.
2. EXCESS SPOILS MAY BE REUSED AS DIVERSION DIKES AT THE DISCRETION OF THE ENGINEER.
3. CONTRACTOR SHALL PERFORM DUST CONTROL AS NEEDED. REFER TO SPECIFICATIONS.
4. CONTRACTOR SHALL MAINTAIN AND INSPECT SESC MEASURES THROUGHOUT THE PROJECT. AT A MINIMUM, CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SESC MEASURES ONCE A WEEK AND AFTER RAIN EVENTS.
5. CONTRACTOR SHALL CORRECT NON-CONFORMING SESC MEASURES WITHIN 24 HOURS, IF WATERS OF THE STATE ARE BEING IMPACTED, OR WITHIN 48 HOURS FOR ROUTINE MAINTENANCE ITEMS. OTHER SESC MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE BUT NEVER MORE THAN FIVE (5) DAYS AFTER DETECTION.
6. CONTRACTOR SHALL COMPLETE PERMENANT SOIL EROSION CONTROL MEASURES FOR ANY DISTURBED LAND AREA WITHIN 5 CALENDAR DAYS AFTER THE FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. CONTRACTOR SHALL MAINTAIN TEMPORARY CONTROL MEASURES UNTIL PERMENANT SOIL EROSION CONTROL MEASURES ARE IN PLACE AND THE AREA IS STABILIZED.
7. CONTRACTOR SHALL REMOVE TEMPORARY SOIL EROSION CONTROL MEASURES AFTER PERMENANT MEASURES ARE IN PLACE AND THE AREA IS STABILIZED. CARE SHALL BE TAKEN DURING THE REMOVAL TO PREVENT SOIL EROSION AND SEDIMENTATION.
8. AFTER SUBSTANTIAL COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL MAINTAIN THE PERMENANT SESC MEASURES FOR ONE (15) YEAR. AFTER THIS ONE YEAR PERIOD, THE SESC MEASURES WILL BE MAINTAINED BY THE OWNER OR ITS DESIGNATED CONTRACTOR.
9. THE SOIL TYPES AT THE AREAS OF PROPOSED WORK ARE A MIXTURE OF SILTS AND CLAYS FROM LOCAL EXCAVATION SPOILS, HOUSEHOLD WASTES, AND DEMOLITION MATERIALS.

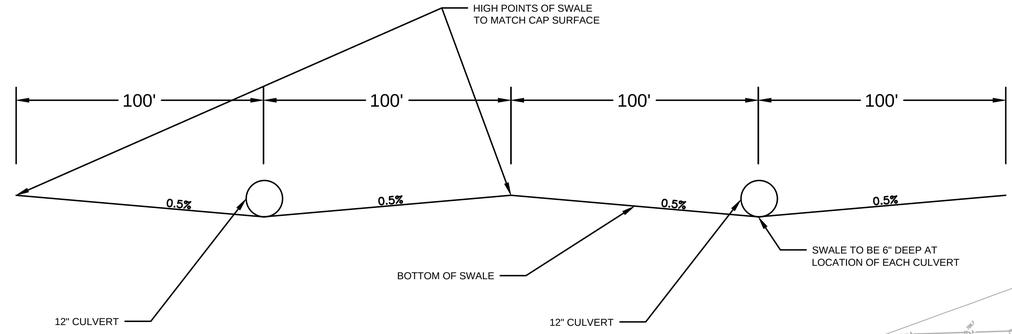
LEGEND

SESC SYMBOL (SEE SPECIFICATIONS)

RIP RAP

SEDIMENTATION BASIN

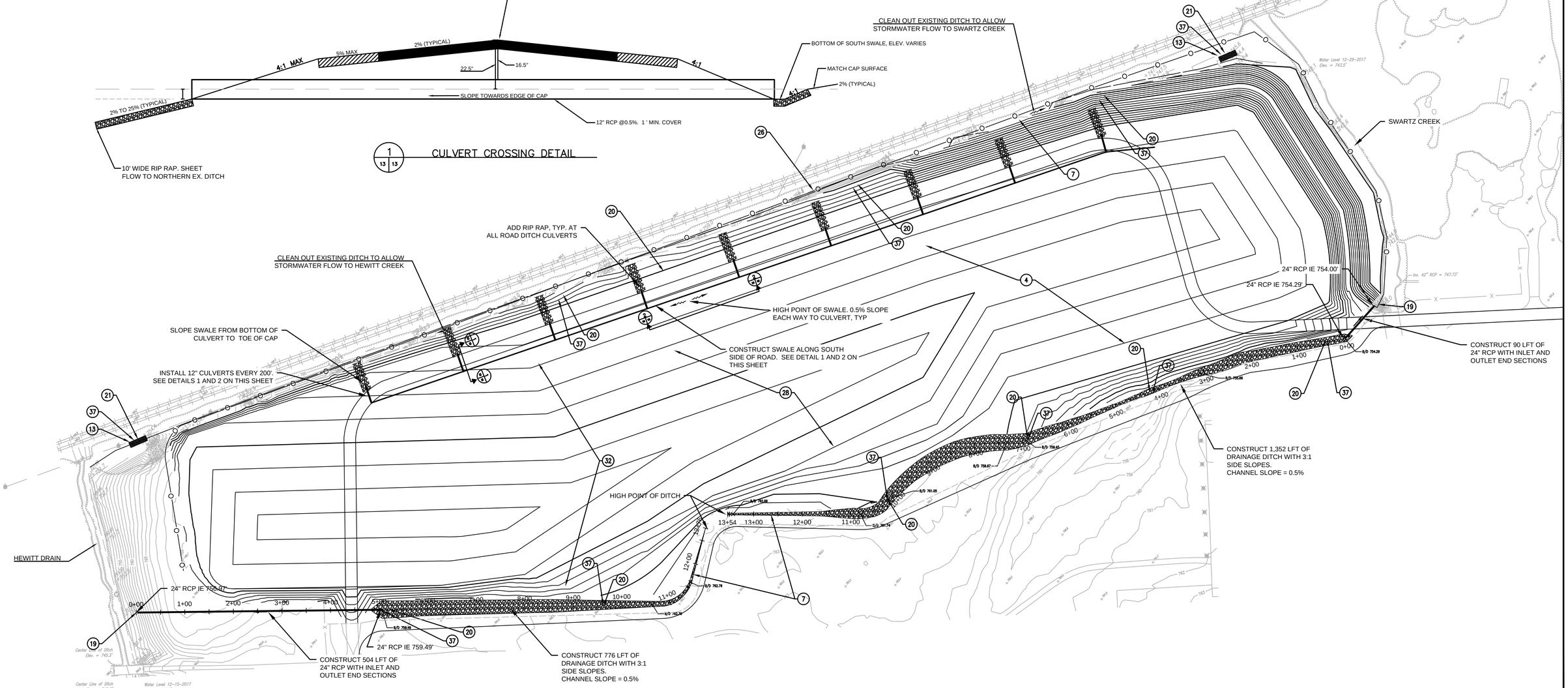
CHECK DAM



2 / 13 13 ROADSIDE SWALE PROFILE SECTION

CONTOURS ARE NOT SOWN ON PLAN FOR ROAD AND DITCHES

1 / 13 13 CULVERT CROSSING DETAIL



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ENVIRONMENT, GREAT LAKES AND ENERGY

CITY OF FLINT
LANDFILL CLOSURE (CAP)
AT FLINT BISHOP AIRPORT

STORMWATER MANAGEMENT & SOIL
EROSION SEDIMENTATION CONTROL PLAN

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 13 **OF** 14

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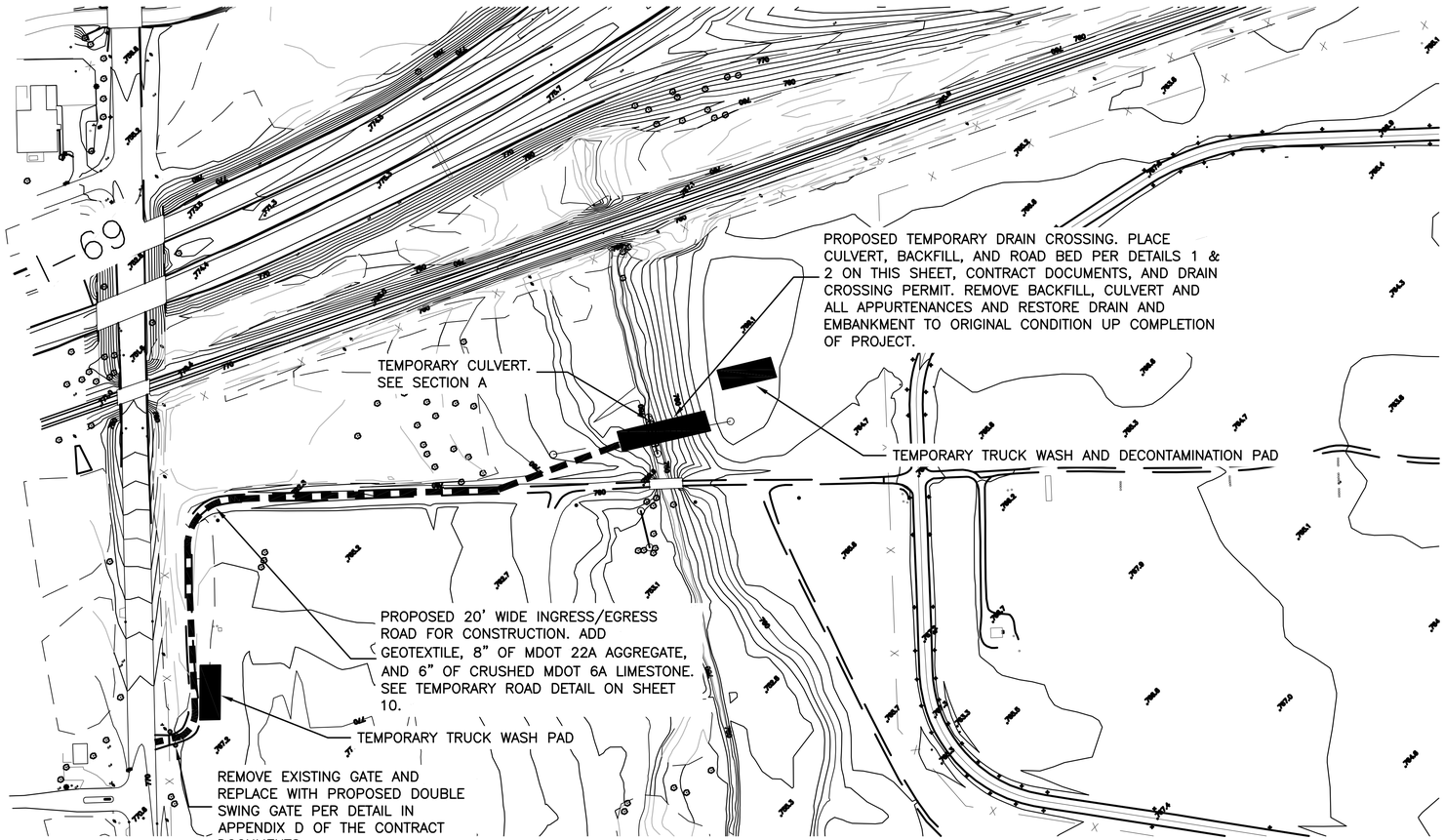
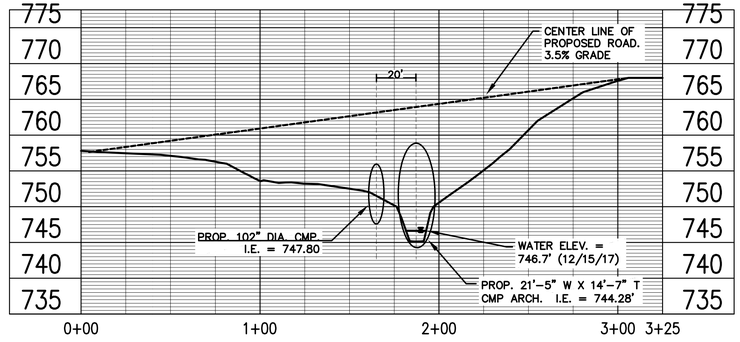
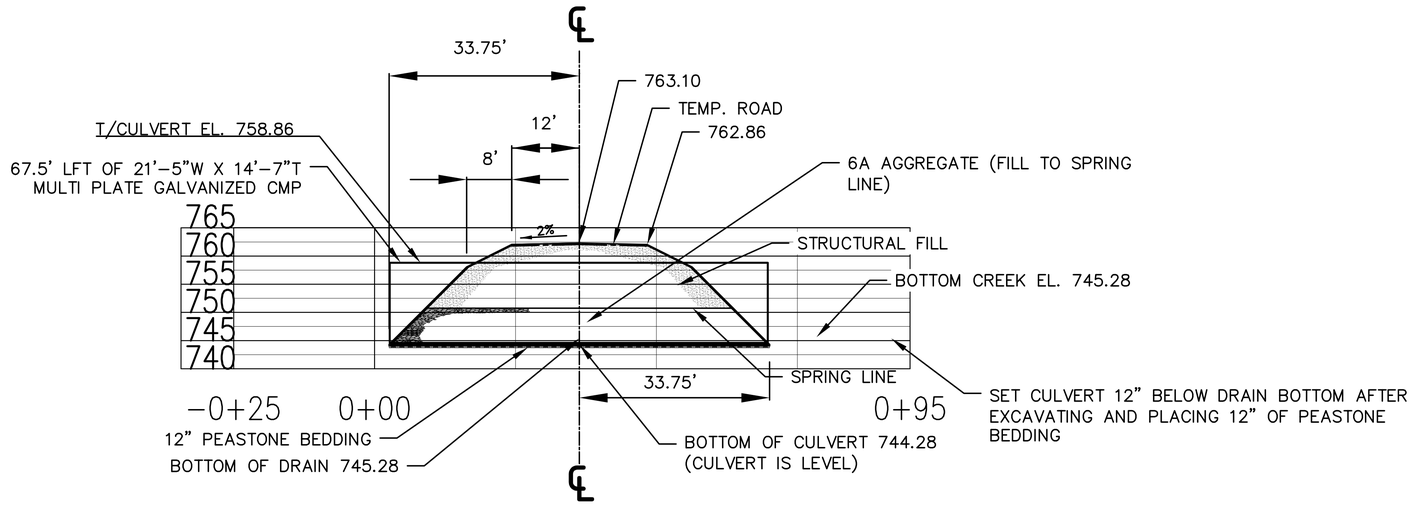


INGRESS/EGRESS PLAN



1 / 14 14 HEWITT DRAIN CROSSING PROFILE



2 / 14 14 TEMPORARY CULVERT – SECTION A

NOTES

CONTRACTOR TO PROVIDE ALL SAFETY MEASURES FOR CONSTRUCTION TRAFFIC IN ACCORDANCE TO GENESEE COUNTY ROAD COMMISSION AND CONTRACT DOCUMENTS.

ONLY CARS AND LIGHTWEIGHT TRUCKS ALLOWED ON EXISTING BRIDGE. CONSTRUCTION VEHICLES SHALL CROSS ON TEMPORARY DRAIN CROSSING ONLY.

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INGRESS/ EGRESS PLAN

SCALE: AS SHOWN
PROJECT NO. 2341-7650-01
SHEET NO. 14 OF 14