

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT

ISSUED TO:

Ann Arbor, City of
Attn: Brian Steglitz
919 Sunset Road
Ann Arbor, MI 48103

Permit No.	10-81-0068-P
Issued	August 23, 2011
Extended	
Revised	
Expires	August 23, 2013

This permit is being issued by the Department of Environmental Quality (MDEQ) under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) and specifically:

- | | |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Part 301 Inland Lakes and Streams | <input checked="" type="checkbox"/> Part 315 Dam Safety |
| <input type="checkbox"/> Part 325 Great Lakes Submerged Lands | <input type="checkbox"/> Part 323 Shorelands Protection and Management |
| <input checked="" type="checkbox"/> Part 303 Wetlands Protection | <input type="checkbox"/> Part 353 Sand Dune Protection and Management |
| <input checked="" type="checkbox"/> Part 31 Floodplain/Water Resources Protection | |

Permission is hereby granted, based on permittee assurance of adherence to State requirements and permit conditions to:

Permitted Activity:

Dredge and fill in the adjacent wetland and 100-year floodplain of the Argo Dam Headrace on the Huron River in order improve the existing earthen dam embankments and provide recreational improvements to the area located Section 20, Township 2 South, Range 6 East, Washtenaw County. Place a maximum of approximately 5,632 cubic yards of fill and cut 3,320 cubic yards of spoils. Spoils will remain onsite. Install approximately 1,255 cubic yards of riprap. Modify the downstream slopes of the existing headrace and overflow spillway embankments to improve the stability of the embankments. Construct eight stepped pools in the existing headrace. Modify the existing upstream box culvert by removing the upper 2.8 feet of the culvert. Construct a steel truss bridge, spanning 25 feet by 12 feet wide, over the channel exiting the headrace into the river. Dredge approximately 32 cubic yards of spoils from 375 square feet of wetland and place 52 cubic yards of fill on 1,037 square feet of wetland. Total wetland impact to be 0.03 acre with no mitigation.

Water Course Affected: Huron River

Property Location: Washtenaw County, City of Ann Arbor, Section 20

Subdivision, Lot Town/Range 2S, 6E Property Tax No.

Authority granted by this permit is subject to the following limitations:

- Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
- The permittee in exercising the authority granted by this permit shall not cause unlawful pollution as defined by Part 31, Floodplain/Water Resources Protection of the NREPA.
- This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
- All work shall be completed in accordance with the plans and the specifications submitted with the application and/or plans and specifications attached hereto.
- No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved herein.
- It is made a requirement of this permit that the permittee give notice to public utilities in accordance with Act 53 of the Public Act of 1974 and comply with each of the requirements of that act.
- This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits or complying with other state statutes.
- This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.

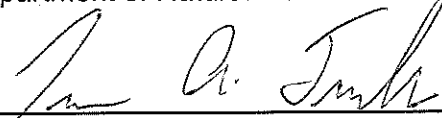
- i. Permittee shall notify the DNRE within one week after the completion of the activity authorized by this permit, by completing and forwarding the attached, preaddressed post card to the office addressed thereon.
- J. This permit shall not be assigned or transferred without the written approval of the DNRE.
- K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific State Act, Federal Act and/or Rule under which this permit is granted.
- L. Work to be done under authority of this permit is further subject to the following special instructions and specifications:
 1. All dam construction shall be in accordance with the revised plans and specifications prepared by Mr. Gary Lacy, P.E., of Recreation Engineering & Planning; and Beckett & Raeder, Inc.; most recently updated August 1, 2011.
 2. All dam construction activity must be conducted under the knowledge and supervision of a licensed professional engineer.
 3. If any change or deviation from the permitted activity becomes necessary, the permittee shall request, in writing, a revision of the permitted activity and/or mitigation plan from the MDEQ. Such revision requests shall include complete documentation supporting the modification and revised plans detailing the proposed modification. Proposed modifications must be approved, in writing, by the MDEQ prior to being implemented.
 4. This permit may be transferred to another person upon written approval of the MDEQ. The permittee must submit a written request to the MDEQ to transfer the permit to the new owner. The new owner must also submit a written request to accept transfer of the permit. The new owner must agree, in writing, to accept all conditions of the permit. A single letter signed by both parties which includes all the above information may be provided to the MDEQ. The MDEQ will review the request and, if approved, provide written notification to the new owner.
 5. A permit may be extended for cause. To request an extension of a permit, a written request must be submitted to the MDEQ before the expiration date of the permit. The request must indicate the reasons for the extension. The MDEQ will review the request and, if approved, provide written notification to the permittee.
 6. Any modification or revision to the approved construction plans and/or specifications must be approved, in writing, by the Water Resources Division, MDEQ.
 7. The permittee shall furnish notification of the start of construction to the Water Resources Division, MDEQ, five (5) days prior to commencement of construction. Contact Mr. Lucas Trumble, Dam Safety Program, at 517-335-3170.
 8. Prior to the initiation of any permitted construction activities, a siltation barrier shall be constructed immediately downgradient of the construction site. Siltation barriers shall be specifically designed to handle the sediment type, load, water depth, and flow conditions of each construction site throughout the anticipated time of construction and unstable site conditions. The siltation barrier shall be maintained in good working order throughout the duration of the project. Upon project completion, the accumulated materials shall be removed and disposed of at an upland (non-wetland, non-floodplain) site. The siltation barrier shall then be removed in its entirety and the area restored to its original configuration and cover.
 9. Any fill/backfill shall consist of clean inert materials that will not cause siltation nor contain soluble chemicals, organic matter, pollutants, or contaminants. All fill shall be CONTAINED in such a manner so as not to erode into any surface water, floodplain, or wetland. All raw areas associated with the permitted activity shall be STABILIZED with sod and/or seed and mulch, riprap, or other technically effective methods as necessary to prevent erosion.
 10. Unless specifically stated under the "Permitted Activity" of this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed in a wetland or on bottomland of the waterbody are not authorized and shall not be constructed unless authorized by a separate permit or

permit revision granted in accordance with the applicable law. If the project, or any portion of the project, is stopped and lies incomplete for any length of time other than that encountered in a normal work week, every precaution shall be taken to protect the incomplete work from erosion, including the placement of temporary gravel bag riprap or other acceptable temporary protection.

11. No work shall be done in the stream during periods of above-normal flows except as necessary to prevent erosion.
12. The permittee is cautioned that grade changes resulting in increased runoff onto adjacent property is subject to civil damage litigation.
13. The design flood or 100-year floodplain elevation at this location on the Huron River is approximately 774 feet N.G.V. Datum of 1929.
14. The permittee shall furnish a written statement from a licensed professional engineer certifying that he or she has supervised the construction of the dam and that it was repaired in accordance with the plans and specifications approved by the Water Resources Division, MDEQ.
15. The permittee shall submit a final engineering report to the Dam Safety Program, Water Resources Division, which shall include, but not be limited to, documentation of the extent of construction, results of construction material testing, soil boring logs, test pit data collection, summaries of instrumentation monitoring for the construction, and other pertinent project information. The report shall also include a set of final project drawings documenting the extent of construction, signed and sealed by a professional engineer licensed in the state of Michigan.
16. Final approval of the dam construction will not be granted until a site inspection by the MDEQ has confirmed that the dams have been constructed in accordance with the approved plans and specifications.
17. Authority granted by this permit does not waive permit requirements under Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, Act 451, of the Public Acts of 1994, being Sections 9101 to 9123, or the need to acquire applicable permits from the County Drain Commission.
18. No fill or excess soil or other material shall be placed in any wetland or surface water area not specifically authorized by this permit, its plans, and specifications.
19. The authority to conduct the activity as authorized by this permit is granted solely under provisions of the governing act as identified above. This permit does not convey, provide, or otherwise imply approval of any other governing act, ordinance, or regulation, nor does it waive the permittee's obligation to acquire any local, county, or federal approval or authorizations necessary to conduct the activity.
20. In issuing this permit, the MDEQ has relied on the information and data which permittee has provided in connection with the permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete, or inaccurate, the MDEQ may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.
21. This permit authorizes only the construction as specified above. This permit does not authorize or sanction other work which has been completed in violation of applicable federal, state, or local statutes.
22. The permittee shall indemnify and hold harmless the State of Michigan and its departments, agencies, officials, employees, agents, and representatives for any and all claims or causes of action arising from acts or omissions of the permittee, or employees, agents, or representatives of the permittee, undertaken in connection with this permit. This permit shall not be construed as an indemnity by the State of Michigan for the benefit of the permittee or any other person.

23. Noncompliance with these terms and conditions, and/or the initiation of other regulated activities not specifically authorized by this permit, shall be cause for the modification, suspension, or revocation of this permit, in whole or in part. Further, the MDEQ may initiate criminal and/or civil proceedings as may be deemed necessary to correct project deficiencies, protect natural resource values, and secure compliance with statutes.

Dan Wyant, Director
Department of Natural Resources and Environment

By 

Lucas A. Trumble, P.E.
Water Resources Division

cc: Washtenaw County Drain Commission
Washtenaw Public Works
City of Ann Arbor Clerk

1. GENERAL

1.01 Work Included but not limited to the following:

- .01 Remove trees and shrubs, including roots
- .02 Remove bituminous pavement and aggregate base.
- .03 Remove concrete walks and drives as indicated.
- .04 Remove spillway and existing bridge.
- .05 Remove miscellaneous items indicated on the drawings.
- .06 Remove all debris from site

1.02 Project Conditions

- .01 Supplemental confirming information as deemed necessary by construction guarantee requirements are recommended at Contractor's expense.
- .02 Neither the Owner or Landscape Architect/Engineer, shall be responsible for any conclusions or interpretations which the Contractor may make on the basis of this information.

1.03 Protection

- .01 Maintain in service and protect from damage the existing utilities that are to remain.
- .02 Before commencing any site preparation activity, contact all municipal service departments, service companies and other utilities affected, and arrange to have the lines that are within the work area accurately located and identified with appropriate surface markers.
- .03 If any other utility lines are known to extend beyond the work area, such lines shall be located and identified as in the above paragraph.
- .04 The use of explosives is prohibited. No burning will be allowed on site.
- .05 Conduct site preparation operations to ensure safety of all persons and to prevent damage to existing structures and utilities, trees and other vegetation to be left in place, construction in progress, and other property.

2. PRODUCTS Not Used

3. EXECUTION

3.01 Removal of trees and shrubs

- .01 Clear the site of existing trees, stumps, shrubs and other vegetation as indicated on the plans, or as necessary to install the proposed work.
- .02 Roots shall be removed to a depth of 12 inches below rough grades in all areas under proposed pavement.
- .03 Tree roots within the areas of embankment backfilling indicated on the plans shall be completely removed.
- .04 All material including merchantable timber and soil material shall become the property of the Contractor and shall be removed from the site. No burning will be permitted.

3.02 Pavement and Curb Removal

- .01 Remove all pavement and curbs as indicated on drawings.
- .02 Saw cut pavement and curb being removed full depth.
- .03 Saw cut pavement and curb at nearest existing joint to the saw cut line depicted on the drawing.

3.03 Concrete pavement removal

- .01 Remove concrete walks, pads, etc. as indicated on the drawings
- .02 Saw cut concrete at nearest existing joint to the saw cut line depicted on the drawing.

3.04 Bridge and spillway removal

- .01 Remove complete existing bridge and spillway.

3.05 Debris removal

- .01 Remove all debris from site and legally dispose of.

- END OF SECTION -

SECTION 02210
SOIL EROSION AND SEDIMENTATION CONTROL

1. GENERAL

1.01 Work Included

- .01 Construction of erosion controls.
- .02 Maintenance of erosion controls.
- .03 Removal of erosion controls.

1.02 Regulatory Requirements

- .01 The Contractor shall comply with Public Act 347, PA 1972 as amended, in executing this work.

1.03 Submittals

- .01 Submit manufacturer product data.
- .02 Submit seed dealer's guaranteed statement of the percentages of purity and germination.
- .03 Soil Erosion and Sedimentation Control Permit. The Contractor shall apply for, and secure a Soil Erosion and Sedimentation Control Permit from the City of Ann Arbor.

2. PRODUCTS

2.01 Sediment Control Fabric Fence: shall be AMOCO Propex Silt Stop Sediment Control fabric or approved equal.

2.02 Inlet Protection Fabric Drop: shall be Catch-All Filter Bag as manufactured by Mar-Mac Manufacturing Co., Inc.

2.03 Seed: shall be perennial Ryegrass with a minimum purity of 98% and a minimum germination of 90%. Seed shall be fresh, clean, new-crop seed. Seed mix shall be per contract plans.

3. EXECUTION

3.01 Timing, Maintenance and Removal of Soil Erosion and Sedimentation Control

- .01 Construct controls prior to grubbing or grading wherever possible.
- .02 Where controls cannot be constructed before work begins, temporary controls may be required between successive construction stages, as directed by the Landscape Architect/Engineer.

- .03 Time Limitations: All grading sections shall be brought to final grade immediately as grading progresses. Permanent soil erosion controls for all slopes, channels, ditches or any disturbed areas shall be completed within 15 days after completion of the grading in any area. All areas not brought to final grades shall have temporary controls implemented within 30 days after grading is completed. All temporary measures shall be maintained as necessary until permanent controls are completed.
- .04 Area Limitations: The area of excavation, borrow, embankment, or other exposed areas shall be limited commensurate to the Contractor's ability to keep the finish grading, mulching, seeding and other controls current.
- .05 Construction of erosion and sedimentation controls shall meet the requirements specified or as directed by the Landscape Architect/Engineer.
- .06 Maintenance of erosion and sedimentation controls shall be done by the Contractor for temporary and permanent controls until contract completion and acceptance. Maintenance consists of repair of all damaged areas, replacements of lost facilities, and periodic removal of sediment.
- .07 Temporary sedimentation controls shall be removed after permanent controls are in place or as directed by the Landscape Architect/Engineer.
- .08 Specific control measures and their locations shall be as shown on the drawings.

3.02 Certified Storm Water Operator

- .01 Prior to beginning any earth change, the contractor shall retain an MDEQ Certified Storm Water Operator (CSWO) to provide the required SESC reports (which include the weekly and storm event reports as well as all follow up reports for both violations and storm event corrections) on the standard MDEQ form. The Contractor shall provide the reports to the Owner on a weekly basis, and retain those reports for three years.
- .02 Prior to beginning any earth change, the Contractor shall install and maintain all SESC measures as shown on the contract documents and as directed by the Owner and Landscape Architect/Engineer, CSWO, or MDEQ at anytime during the life of the contract or until the Owner officially takes over responsibility for the site. Immediately prior to the Owner taking responsibility for the site, the contractor will be required to clean all catch basins affected by the construction, both within the contract limits and all surrounding roads and lawn areas where soil may have spread as the result of construction activities.
- .03 Should violations be identified by the Owner, Landscape Architect/Engineer, CSWO, or MDEQ, they shall be corrected within 24 hours of notification. The Owner, Landscape Architect/Engineer, CSWO, or MDEQ shall approve the correction(s). All subsequent inspections performed by the Owner, Landscape Architect/Engineer, CSWO, or MDEQ as a result of the violation (and any other associated costs) will be paid by the contractor. If identified violations are not corrected within 24 hours of written notice, the Owner will make the required repairs without further notification, at the Contractor's expense.

.04 Fines assessed as a result of the violation for noncompliance of the SESC provisions, will be paid by the Contractor. Should a "stop work" order for noncompliance be issued, a time extension request for that time period will not be granted.

- END OF SECTION -

1. GENERAL

1.01 Work Included

- .01 Excavation
- .02 Backfilling
- .03 Disposal of cut and excavated material in designated area on-site
- .04 Disposal of excess material
- .05 Compaction
- .06 Grading

1.02 Project Conditions

- .01 Verify existing utility locations prior to beginning earthwork operations.
- .02 Protect existing features designated to remain as part of the final landscape work.
- .03 Promptly repair damage to adjacent facilities caused by earthwork operations. Cost of repairs at Contractor's expense.
- .04 Promptly notify Landscape Architect/Engineer of unexpected sub-surface conditions.
- .05 Refer to the attached report for existing soil conditions.

1.03 Project Record Documents

- 01. Submit Record Documents.

1.04 Protection

- .01 Protect trees, shrubs, lawns, and other features remaining as portion of final landscaping.
- .02 Protect bench marks and existing structures.
- .03 Protect above or below grade utilities which are to remain.
- .04 Protect exposed grade from erosion. Refer to soil erosion and Sedimentation Control specifications.
- .05 Repair damage.

- 1.05 Tests
- .01 The Contractor will employ a qualified testing laboratory to furnish all of the soil engineering services required for testing and inspections.
 - .02 The testing laboratory will make all tests of materials to determine their suitability for compaction and optimum water content, and will monitor the placing of the fill and backfill.
 - .03 The representatives of the testing laboratory shall have the power of rejection of materials, equipment or operating procedures, of the filling or backfilling operation. The Contractor shall replace, rework or correct work that does not meet the specifications as directed by the testing laboratory and/or the Landscape Architect/Engineer.

- 1.06 References
- .01 ANSI/ASTM D1557 - Moisture-Density Relations of Soils and Soil-Aggregate Mixture.

2. PRODUCTS

- 2.01 Common Fill Materials
- .01 All fill material shall be free of gravel, rock, or stone larger than two inch size, and debris and will be subject to acceptability by the Testing Laboratory to be suitable for achieving the required compaction.
 - .02 When necessary, compact subsoil surfaces to density requirements for backfill material.
 - .03 Engineered fill for headrace embankment earthwork with permeability of 10 cm/sec or greater. Engineered fill for headrace embankment earthwork to be free of frozen soil, organics, rubble, debris, cobble, boulders or other deleterious materials.
 - .04 Filter fabric : Mirafi 500x or approved equal.
 - .05 Rip rap: 4"-8" crushed limestone, free of debris.

- 2.02 Cut Material
- .01 All cut and excavated material shall be relocated on-site. If an excess amount of cut material is generated beyond the capacity of the designated excavation spoils disposal area, it shall be removed from the site and properly disposed of.
 - .02 Boulders larger than six (6) inch diameter are to be removed and disposed of legally off-site unless they can be incorporated in the work for dry laid stone walls and/or rip rap consistent with the project details and specifications.

3. EXECUTION

3.01 Preparation

- .01 Identify required lines, levels, contours, and datum. Employ registered land surveyors for layout.
- .02 Identify known below grade utilities. Stake and flag locations.
- .03 Identify and flag above grade utilities.
- .04 Maintain and protect existing utilities which pass through work area.
- .05 Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Landscape Architect/Engineer.
- .06 When necessary, compact subsoil surfaces to density requirements for backfill material.
- .07 Cut out soft areas of subsoil not readily capable of compaction. Backfill with imported soil and compact to density equal to requirements for subsequent backfill material.
- .08 Headrace Embankment Reconstruction:
 - .01 Excavate 2' into existing embankment at the toe of slope. Identify, if any, the size and locations of existing toe drains. Verify existing toe drain is intact.
 - .02 Determine proposed path of toe drain extension so that the pipe daylights near the toe of the newly constructed slope. If extension must bend to avoid obstacles such as landmark trees, install long-sweeps and cleanouts so that future maintenance can be performed. Provide a sketch to the Owner and the Engineer for review and approval prior to installation.
 - .03 Connect and install drainage pipe extension. Slope of pipe can range from flat to pitched to drain toward the main stream of the Huron River.
 - .04 Prepare and submit as-built of the toe drain extension for Owner review prior to backfilling.
 - .05 Bed pipe in 12" Class II material. Backfill pipe extension to 12" above top of pipe with Class II material. Backfill the balance of the trench with engineered fill per the Specifications.
 - .05 Contractor to prepare and submit to Owner an emergency Action Plan including emergency contact phone numbers and an action plan to stop any groundwater seepage.

3.02 Hold Downs

- .01 Finish grades are shown on plans by solid contour lines and spot elevations. The rough grades shall be held down to allow for finish materials as shown on drawings.

- 3.03 Topsoil and Organic Material Excavation
- .01 Excavate topsoil and organic material from areas to be further excavated, filled or otherwise constructed upon and relocate on site in the designated excavation spoils disposal area.
- 3.04 Subsoil Excavation
- 01. Excavate subsoil from areas to be regraded and stockpile in area approved by Landscape Architect/Engineer.
 - .02 Do not excavate wet subsoil.
 - .03 Stockpile subsoil to depth not exceeding 8 feet.
 - .04 Headrace Embankment Excavation: Bench-cut in maximum 2' level cuts. Place fill as soon as possible after bench cut has been made. Remove unsuitable subgrade. Compact subgrade to 95% modified proctor density ASTM D1557.
- 3.05 Backfilling
- .01 Backfill areas to contour and elevations. Use unfrozen materials.
 - .02 Fill lowest elevation first and the fill shall be spread in approximately horizontal layers.
 - .03 Backfill systematically, as early as possible, to allow maximum time for any natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
 - .04 Place and compact common fill material in continuous layers not exceeding 8 inches loose depth.
 - .05 Employ a placement method so not to disturb or damage drainage utilities in trenches.
 - .06 The surface of the fill shall be finished to such contour that it will not impound water. If at the end of the day's work it appears that there may be rain prior to the next working day, the surface shall be finished smooth.
 - .07 Maintain optimum moisture content of backfill materials to achieve 95% modified proctor density ASTM D1557.
 - .08 Make changes in grade gradual. Blend slopes into level areas.
- 3.06 Backfilling – Headrace Embankment
- .01 Backfill areas to contour and elevations. Use unfrozen materials.
 - .02 Fill lowest elevation first and the fill shall be spread in approximately horizontal layers.
 - .03 Backfill systematically, as early as possible, to allow maximum time for any natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

- .04 Place and compact engineered fill in level layers not exceeding 9" in depth. Compact each lift to a minimum of 90% of the maximum dry density as determined in accordance with the Modified Proctor test.
- .05 In work specifying rip rap backfill, place Mirafi 500x or approved equal geotextile fabric on compacted subgrade prior to placement and compaction of rip rap.
- .05 Compact with smooth drum vibratory roller or vibratory plate compactors.
- .06 Make changes in grade gradual. Blend slopes into level areas.

3.07 Tolerances

- .01 Top Surface of Subgrade: Plus or minus 0.05 foot.

3.07 Field Quality Control

- .01 Representatives of the testing laboratory may, at the direction of the Landscape Architect/Engineer or Owner, monitor the placing of the fill material.

- END OF SECTION -

1. GENERAL

1.01 Work Included

- .01 Finish grade subsoil and proof roll.
- .02 Place, level and compact topsoil.

1.02 Protection

- .01 Protect landscaping and other features remaining as final work.
- .02 Protect existing structures, roads, sidewalks, paving, and curbs.

1.03 Submittals

- .01 Submit a certified analysis of topsoil prior to delivery. Deficiencies in the criteria indicated in 2.01.02 below shall be corrected.
- .02 Submit a deficiency correction plan prepared by the MSU Extension Service specifically addressing the criteria indicated in 2.01.02 below.

2. PRODUCTS

2.01 Materials

- .01 Topsoil shall be supplied from onsite topsoil stockpiles or an approved offsite source. Offsite source shall be fertile, sandy clay loam without admixture of subsoil, and shall be free of stones 1/2 inches in diameter or larger, roots, sticks, or other extraneous material including viable plants or plant parts of bermuda or quack grass, poison ivy, etc.
- .02 Topsoil from offsite shall meet the following criteria:

pH range between 5.0 and 7.5
soluble salts maximum 500 parts per million (ppm)
organic content between 5 and 30%
clay content between 5 and 25%

3. EXECUTION

3.01 Inspection

- .01 Verify site conditions and note irregularities affecting work of this section.
- .02 Beginning work of this section means acceptance of existing conditions.

3.02 Subsoil Preparation

- .01 Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.

- .02 Scarify subgrade to depth of 2 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.03 Placing Topsoil

- .01 Spread topsoil to a minimum depth as identified on the plans. Where sod is to be placed, the finish grade of topsoil shall be 1" below adjacent hardscape surfaces, ready to accept sodded lawn.
- .02 Use topsoil in relatively dry state. Place during dry weather.
- .03 Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours or subgrade.
- .04 Remove stones larger than 1/2", roots, grass, weeds, debris and foreign material while spreading.
- .05 Manually spread topsoil around trees to prevent damage.
- .06 Lightly compact placed topsoil.
- .07 Remove surplus subsoil and topsoil from area being finished to the designated on-site excavation spoils disposal area.
- .08 Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 Tolerances

- .01 Top of Topsoil: Plus or minus 0.05 foot.

- END OF SECTION -

SECTION 02511
AGGREGATE BASE

1. GENERAL

1.01 Work Included

.01 Aggregate Base for Bituminous Pavements

1.02 References

.01 Michigan Department of Transportation (MDOT): 2003 Standard Specification for Construction.

1.03 Submittals

.01 Submit aggregate samples.

1.04 Tests

.01 Representatives of the Testing Laboratory will make all tests of aggregate base materials to determine compaction and may supervise the place of aggregate base.

.02 Representatives of the Testing Laboratory and the Landscape Architect/Engineer shall have the power of rejection of materials, equipment or operating procedures of the aggregate base operation. The Contractor shall replace, rework or correct work which does not meet the specifications as directed by the Testing Laboratory and/or the Landscape Architect/Engineer.

2. PRODUCTS

2.01 .01 Aggregate Base for Pavements: MDOT designated 21AA Crushed Limestone

3. EXECUTION

3.01 Inspection

.01 Proof roll subbase as directed by Testing Laboratory Representative. Verify compacted subbase is dry and ready to support aggregate base and imposed loads. Soft or yielding areas which cannot be mechanically stabilized shall be removed and replaced with approved compacted granular material.

.02 Verify gradients and elevations of base are correct.

.03 Beginning of installation means acceptance of existing conditions.

3.02 Placing Aggregate

.01 Place aggregate base within 24 hours of subbase preparation.

.02 Spread aggregate over prepared subbase to achieve a total compacted depth as indicated on drawings.

- .03 Place aggregate in 6 inch layers and compact.
- .04 Level surfaces to elevations and gradients indicated.
- .05 Compact placed aggregate materials to achieve 95% Modified Proctor Density (ASTM D1557). Compaction testing required for each day placement.
- .06 Add water to assist compaction. With an excess water condition, rework topping and aerate to reduce moisture content.

- END OF SECTION -

SECTION 02513
ASPHALTIC CONCRETE PAVING

1. GENERAL

1.01 Work Included

.01 Asphaltic concrete paving.

1.02 References

.01 Michigan Department of Transportation (MDOT) 2003 Standard Specifications for Construction.

1.03 Quality Assurance

.01 Perform work in accordance with Michigan Department of Transportation (MDOT) -- 2003 Standard Specification for Construction.

Division 5, Hot Mix Asphalt Pavements and Surface Treatments

Division 9, Materials

.02 Obtain materials from same source throughout.

1.04 Tests

.01 The Owner will employ a qualified Testing Laboratory to furnish all required testing and inspection.

1.05 Submittals

.01 Submit Marshall Mix design for Landscape Architect/Engineer's approval a minimum of three working days prior to placement.

.02 Submit tested Mix Design Criteria a minimum of three working days prior to placement.

1.06 Environmental Requirements

.01 Do not place asphalt when base surface temperature is less than 40 degrees or when rain is threatening.

2. PRODUCTS

2.01 Materials

.01 Anionic Emulsified Asphalt (Tack Coat): MDOT designated SS-1h.

.02 Asphalt Binder: MDOT designated performance grade 52-28.

- 2.02 Asphalt Paving Mix
 - .01 Leveling Course: MDOT 1100L-20AA or MDOT Mixture No. 13A (1 ½" deep)
 - .02 Wearing Course: MDOT 1100T-20AA or MDOT Mixture No. 13A (1 ½" deep)
- 3. EXECUTION
 - 3.01 Inspection
 - .01 Verify compacted base is dry and ready to support paving and imposed loads.
 - .02 Verify grades and elevations of base are within specified tolerances..
 - .03 Beginning of installation means acceptance of base.
 - 3.02 Preparation
 - .01 Set and adjust all utility structures located within pavement area.
 - .02 Coat surfaces of utility structure covers with oil to prevent bond with bituminous paving.
 - .03 Apply weed killer on the base aggregate prior to placement of any bituminous material.
 - .04 Prior to placement of the bond coat, the pavement surface including joints, cracks and edges shall be thoroughly cleaned to remove all dirt, debris, and foreign material.
 - 3.03 Placing Asphalt Pavement
 - .01 All courses shall be compacted to a density of at least 97 percent of the Marshall Control Density, as determined by the Modified MDOT Marshall Test.
 - .02 Apply tack coat over all areas except the gravel base at a uniform rate of 0.05 gallons per square yard when either 24 hours have elapsed between placement of courses or the surface of the pavement has been contaminated with dirt, dust, or other foreign material.
 - .03 The rate of the paver shall be such that the paving operation will be continuous, resulting in no transverse cold joints. The Contractor shall coordinate trucks to keep the paver moving continuously at all times.
 - .03 Place wearing course within 24 hours of placing and compacting leveling course or after tack coat has been properly cured.
 - .04 Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
 - .05 Develop rolling with consecutive passes to achieve even and smooth dense surface, without roller marks and free of irregularities

.06 Feather joints shall be placed as directed and constructed so as to vary the thickness from zero inches to the required pavement thickness over approximately a 10-foot distance. Large aggregate shall be raked out of feather joints prior to compaction.

.07 The use of a spreader box will not be permitted.

3.04 Tolerances

.01 After final rolling, the Engineer will check the surface with a 10 foot straight edge at selected locations. The variation of the surface, from the testing edge of the straightedge, between any two contacts with the surface shall at no point exceed ¼ inch. Vertical curves are excluded from this requirement.

.02 All bituminous thickness dimensions are assumed to be compacted in place.

.03 In barrier free parking spaces, ADA requirement of maximum 2% slope in any direction supercedes any allowable tolerance from achieving design grades.

3.06 Field Quality Control

.01 Representatives of the testing laboratory and/or the Landscape Architect/ Engineer will supervise the placing of the asphalt materials.

.02 The Owner reserves the right to require the Contractor, at his own expense, to core and patch a maximum of three holes per parking area (18 total) in the bituminous surface to determine the compaction, thickness and design mix by an independent laboratory. The laboratory fee will be paid by the Owner.

- END OF SECTION -

SECTION 02514
PORTLAND CEMENT CONCRETE PAVING

1. GENERAL

1.01 Work Included

- .01 Concrete walks, curbs, gutters and drives.
- .02 Reinforcement.
- .03 Surface finish.
- .04 Curing.

1.02 References

- .01 ACI 301 - Specifications for Structural Concrete for Buildings.
- .02 ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .03 ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- .04 ASTM C33 - Concrete Aggregates.
- .05 ASTM C94 - Ready Mixed Concrete.
- .06 ASTM C150 - Portland Cement.
- .07 ASTM C260 - Air-Entraining Admixtures for Concrete.
- .08 ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- .09 ASTM C494 - Chemical Admixture for Concrete.
- .10 Michigan Dept. of Transportation (MDOT) 1990 Standard Specification for Construction.
- .11 CRSI-Concrete Reinforcing Steel Institute, Manual of Standard Practice.

1.03 Quality Assurance

- .01 Obtain materials from same source throughout.
- .02 Perform work in accordance with Michigan Dept. of Transportation (MDOT) 2003 Standard Specification for Construction.

1.05 Tests

- .01 The Contractor will employ a qualified Testing Laboratory to furnish all required testing and inspection.
- .02 Submit proposed mix design to Landscape Architect/Engineer for review prior to commencement of work.

- .03 Testing firm will take cylinders, perform slump and air entrainment tests in accordance with ACI 301. Minimum of one set of cylinders per truck.
- 1.06 Submittals
 - .01 Submit product data on joint filler, admixtures, curing compounds , and mix design.-
- 1.07 Environmental Requirements
 - .01 Do not place concrete on frozen base, or when rain is threatening.
- 2. PRODUCTS
- 2.01 Concrete Materials
 - .01 Cement: ASTM C150 - Type I Portland type, gray color.
 - .02 Fine and Coarse Aggregates: ASTM C33, fine MDOT designated 2NS, coarse MDOT designated 6AA.
 - .03 Water: Potable, clean and not detrimental to concrete.
- 2.02 Form Materials
 - .01 Wood or steel form materials, profiled to suit conditions.
- 2.03 Accessories
 - .01 Curing Compound: Clear fugitive dye. Flatwork shall be wet cured.
 - .02 Expansion Joint: 1/2" or 1" as specified, pre-molded vinyl.
- 2.04 Admixtures
 - .01 Air Entrainment: ASTM C260.
 - .02 Chemical Admixture: ASTM C494, Type B and D only, Type B - Retarding, Type D - water reducing and retarding.
- 2.05 Concrete Mix-
 - .01 Mix concrete in accordance with ASTM C94.
 - .02 Concrete mixture shall meet MDOT designated grade 35S, 3500 psi 28 day compressive strength, 5-7% air-entrainment, 564 lbs. cement content per cubic yard.
 - .03 Use set-retarding admixtures during hot weather only when approved by Testing Laboratory.
- 2.06 Granular Base
 - .01 MODT 21AA Limestone aggregate under Heavy Duty Vehicle Concrete Pavement
 - .02 MDOT Class II under all other concrete walks and pavements.

3. EXECUTION

3.01 Inspection

- .01 Verify compacted subgrade is ready to support paving and imposed loads.
- .02 Verify gradients and elevations of subgrade are correct.
- .03 Beginning of installation means acceptance of existing conditions.

3.02 Preparation

- .01 Set and adjust all utility structures located within pavement area.
- .02 Place and compact granular base material under pavement to thickness as detailed on plans.
- .03 Moisten base to minimize absorption of water from fresh concrete.
- .04 Notify Landscape Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

3.04 Formed Joints

- .01 Place expansion and control joints in the EXACT location shown on the drawings.
- .02 Place expansion joint filler between paving components and building or other appurtenances. Recess top of filler 1/2 inch.

3.05 Placing Concrete

- .01 Place concrete in accordance with ACI 301. Place within 90 minutes of batch time.
- .02 Hot Weather Placement: ACI 301. (include cold weather concrete spec as well)
- .03 Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.
- .04 Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- .05 Place concrete to scoring pattern indicated on drawings. All joints to be straight lines or smooth curves.

3.06 Finishing

- .01 Pavement: Light broom.
- .02 Walk Paving: Medium broom.
- .03 Curbs and Gutters: Light broom.
- .04 Place clear fugitive dye curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions. Apply at minimum rate of one gallon per 200 square feet.

3.07

Field Quality Control

- .01 Field inspection and testing will be performed by Testing Laboratory.
- .02 Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

3.08

Protection

- .01 Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, mechanical injury and vandalism.

- END OF SECTION -

1. GENERAL

1.01 Work included:

- .01 Preparation of topsoil.
- .02 Fertilizing.
- .03 Seeding.
- .04 Mulching.
- .05 Maintenance.

1.02 References

- .01 Michigan Department of Transportation (MDOT) - 2003 Standard Specification for Construction.

1.03 Definitions

- .01 Weeds: includes dandelion, jimsonweed, quackgrass, horsetail, morning glory, rush grass, mustard, lambsquarter, chickweed, cress, crabgrass, Canadian thistle, nutgrass, poison oak, blackberry, tansy ragwort, Bermuda grass, Johnson grass, poison ivy, nut sedge, nibble will, bindweed, bent grass, wild garlic, perennial sorrel and brome grass.

1.04 Quality Assurance

- .01 Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.

1.05 Tests

- .01 Analyze topsoil to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

1.06 Submittals

- .01 Submit test results on topsoil and recommended methods to correct deficiencies, if any.
- .02 Submit producer's seed mix certifications for each type of seed mix.

1.07 Delivery, Storage, and Handling

- .01 Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- .02 Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

- 1.08 Maintenance Service
 - .01 Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition (minimum of three cuttings).
- 2. PRODUCTS
 - 2.01 Seed mixes
 - .01 Provide seed mixes as indicated on the Plans.
 - 2.02 Erosion Control Mulch:
 - .01 Erosion Control Mulch to be Cocoflex ET-FGM flexible growth medium, Profile Products, Inc., 750 Lake Cook Rd, Ste. 440, Buffalo Grove, IL 60089. (800)508-8681. profileproducts.com.
 - 2.04 Fertilizer: Recommended for grass with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil as indicated in analysis shall contain in minimum 4% phosphorus acid, 2% soluble potash and sufficient nitrogen to provide one pound of actual nitrogen per 1000 square feet of lawn area.
- 3. EXECUTION
 - 3.01 Inspection
 - .01 Verify that prepared topsoil base is ready to receive the work of this section.
 - .02 Beginning of installation means acceptance of existing site conditions.
 - 3.02 Preparation of Topsoil
 - .01 Work topsoil to a smooth, uniform surface compacted firmly. Any lumps or depressions which occur shall be regraded and rerolled until a satisfactory grade is obtained.
 - .02 Areas may be machine-finished provided:
 - (1) that a smooth finely pulverized seedbed is produced
 - (2) that machinery and method of operations are approved
 - .03 Hand rake three foot (3') strip adjacent to paving or structures.
 - .04 Remove roots or other objectionable material over one inch (1") in any dimension which might interfere with the formation of a finely pulverized seedbed.
 - .05 The prepared area shall be thoroughly rolled with an approved lawn roller and all low spots leveled up.
 - 3.03 Planting Season: April 1st through May 31st or August 16th through October 10th unless otherwise noted on plans or directed by the Landscape Architect/Engineer or Owner's Representative.

- 3.04 Fertilizing
 - .01 Apply fertilizer in accordance with manufacturer's instructions.
 - .02 Apply after smooth raking of topsoil.
 - .03 Do not apply fertilizer at same time or with same machine as will be used to apply seed.
 - .04 Mix thoroughly into upper two inches (2") of topsoil.
- 3.05 Mechanical Seeding
 - .01 Apply seed at a rate of 4 lbs./1000 s.f. evenly in two intersecting directions. Rake in lightly. Do not seed area in excess of that which can be mulched on same day.
 - .02 Do not sow immediately following rain, when ground is too dry, or during windy periods.
 - .03 Within 24 hours after seeding, all areas shall be mulched using a straw or excelsior mulch. Mulch shall be spread evenly with extreme care so as to leave the seeded surface with a minimum amount of damage.
 - (1) Straw mulch shall be applied uniformly at a rate of approximately 2 tons per acre on seeded areas. The mulch shall be loose enough to permit air to circulate but compact enough to reduce erosion.
 - (2) Excelsior mulch shall be spread at a uniform rate of 71 bales per acre.
 - .05 Anchoring Straw Mulch: mulch shall be held in place by a spray coating of adhesive material. Mulch adhesive shall be applied by spraying simultaneously with the mulch or by spraying a surface application of adhesive immediately following mulching. The mulch adhesive shall be applied at the rates of 150 gallons per acre.
 - .06 Erosion Control Mulch: apply specified erosion control mulch at the specified rate on all disturbed areas immediately after seeding.
- 3.06 Maintenance
 - .01 Water the lawn until final acceptance to prevent grass and soil from drying out.
 - .02 Immediately reseed areas that show bare spots.
- 3.07 Acceptance
 - .01 It is the responsibility of the Contractor to establish a dense stand of grasses, free from lumps and depressions. Any part of the area that fails to show a uniform germination shall be reseeded and such reseeded shall continue until a dense stand is established. Damage to seeded areas resulting from erosion shall be repaired by the Contractor. Scattered bare spots will not be allowed over 3% of the area.

- .02 Acceptance: When the above requirements of the specifications have been fulfilled, the Contractor will request acceptance of the lawn areas and the Owner will continue with the maintenance. Any areas that are not acceptable at this time shall be reseeded and will continue under the Contractor's maintenance until final acceptance. Continued maintenance shall include watering until final acceptance as necessary to keep the seeded areas in a thriving condition. Continued maintenance of lawns shall also include mowing whenever the grass reaches a height of three (3) inches. (applicable)

- END OF SECTION -

1. GENERAL

1.01 Work Included

- .01 Formwork, shoring, bracing and anchorage.
- .02 Concrete reinforcement and accessories.
- .03 Cast-in-place concrete.
- .04 Pre-cast Concrete Bollards

1.02 References

- .01 Michigan Department of Transportation – 2003 Standard Specifications for Construction.
- .02 ASTM A615 – Deformed and Plain Billet-Steel for Concrete Reinforcement.
- .03 ASTM C33 – Concrete Aggregates.
- .04 ASTM C94 – Ready-Mixed Concrete.
- .05 ASTM C150 – Portland Cement.
- .06 ASTM C260 – Air Entraining Admixtures for Concrete.
- .07 ASTM C309 – Liquid Membrane-Forming Compounds for Curing Concrete.
- .08 CRSI – Concrete Reinforcing Steel Institute, “Manual of Standard Practice”.
- .09 PCI MNL-117 – Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.

1.03 Quality Assurance

- .01 Perform work in accordance with MDOT Section 5.03.
- .02 Obtain materials from same source throughout.

1.04 Tests

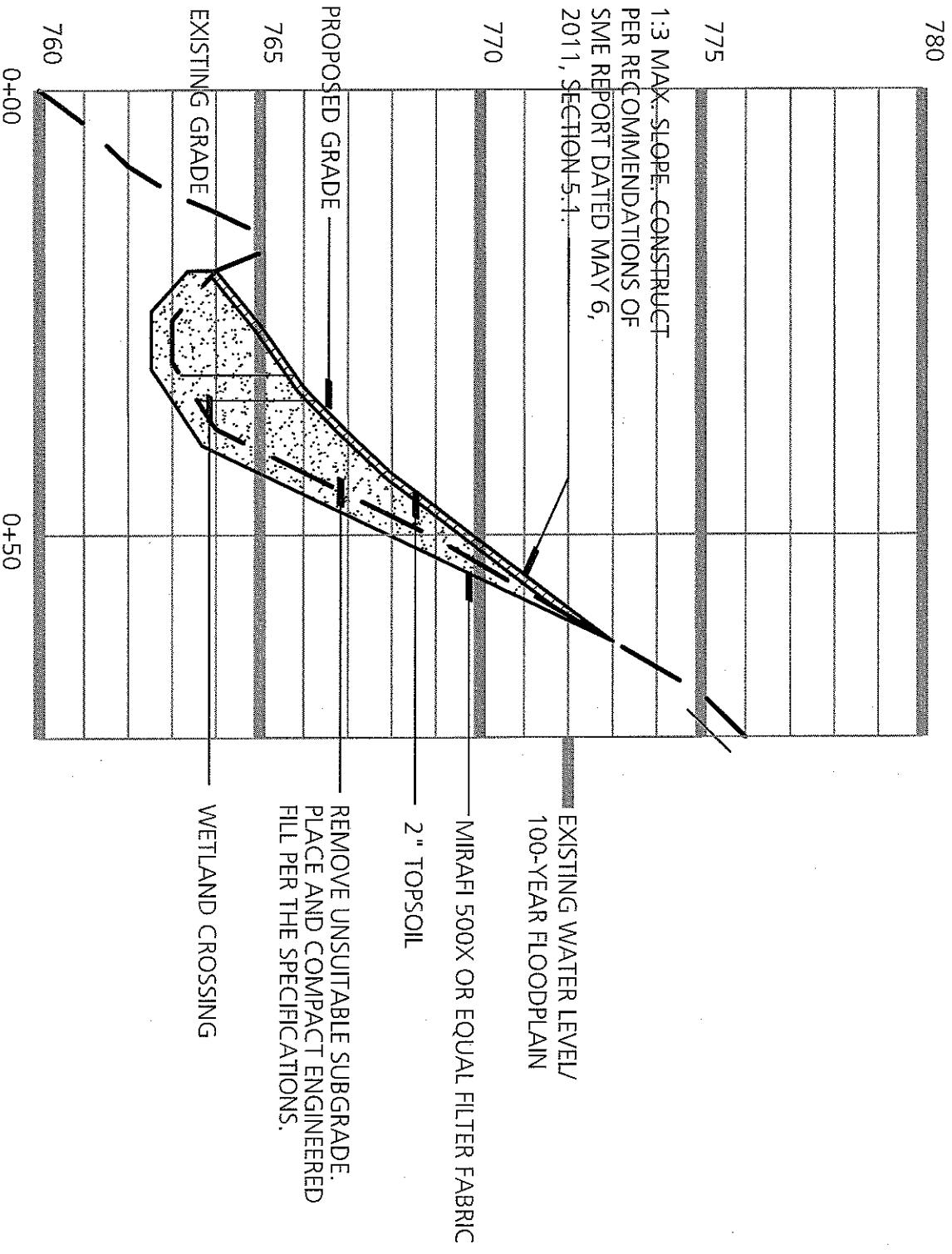
- .01 Testing and analysis of concrete will be performed by a Testing Laboratory hired by the Owner through the Landscape Architect/Engineer.
- .02 Submit proposed mix design to Landscape Architect/Engineer for review prior to commencement of work.
- .03 Testing Laboratory will take cylinders, perform slump and air entrainment tests in accordance with MDOT Section 7.01.

- 1.05 Precast Fabricator Qualifications
 - .01 Company shall specialize in performing Work of this section with minimum three years experience.
- 1.06 Delivery, Storage and Handling of Precast Concrete Units
 - .01 Handle precast units to position, consistent with their shape and design.
 - .02 Blocking and Lateral Support During Transport and Storage: Handle so as to prevent contact between units and other objects that could cause damage to units. Damaged units arriving at the job site will be rejected.
 - .03 Protect units from staining, chipping or spalling of concrete.
- 1.07 Submittals
 - .01 Shop Drawings for Precast Concrete Bollards: Indicate layout, configuration, reinforcement, connection details, dimensions, openings, etc.
- 2. PRODUCTS
- 2.01 Form materials
 - .01 Forms for Exposed Concrete: MDOT designated Type A Surface. Inside of forms shall be free of holes or irregularities.
 - .02 Forms for Unexposed Concrete: MDOT designated Type B Surface.
 - .03 Forms Ties: Sufficient size and strength to hold the form work securely in place during placement of concrete. The ends shall be removed to a depth of ¾ inch from surface. Shall not be used with any device which will leave a opening in the face greater than 1 inch in diameter.
- 2.02 Reinforcing Steel
 - .01 Reinforcing Steel: ASTM A615, 60 ksi yield grade billet steel, deformed bars; uncoated finish.
- 2.03 Concrete Materials
 - .01 Cement: ASTM C150, normal – Type 1, Portland type, grey color.
 - .02 Fine and Coarse Aggregates: ASTM C33, fine MDOT designated 2NS, coarse MDOT designated 6AA.
 - .03 Water: Clean and not detrimental to concrete.
- 2.04 Admixtures
 - .01 Air Entrainment Admixture: ASTM C260.
- 2.05 Accessories

- .01 Form Release Agent: Light, clear, paraffin-base oil material which will not stain concrete, absorb moisture.
- 2.06 Curing Materials
- .01 Water: Clean and drinkable.
 - .02 Membrane Curing Compound: Clear fugitive dye.
- 2.07 Concrete Mix
- .01 Mix concrete in accordance with ASTM C94.
 - .02 Concrete mixture shall meet MDOT designated grade 35S, 3500 psi – 28 day compressive strength, 5-7% air-entrainment, 564 lbs. cement content per cubic yard.
 - .03 Use accelerating admixtures in cold weather only when approved by Landscape Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
 - .04 Use set-retarding admixtures during hot weather only when approved by Landscape Architect/Engineer.
3. EXECUTION
- 3.01 Fabrication of Precast Bollards
- .01 Fabricate in conformance with PCI MNL-117 and ACI 318.
 - .02 Maintain plant records and quality control program during production of precast units. Make records available upon request.
 - .03 Use rigid molds, constructed to maintain precast unit uniform in shape, size and finish.
 - .04 Maintain consistent quality during manufacture.
 - .05 Embed reinforcing steel, anchors, insert plates and other cast-in items.
 - .06 Cure units to develop concrete quality and to minimize appearance blemishes including non-uniformity, staining or surface cracking.
- 3.02 Fabrication Tolerances – Precast Units
- .01 Maximum out of square: 1/8 inch in 10 feet.
 - .02 Variation from dimensions indicated on shop drawings: Plus or minus 1/8 inch.
 - .03 Maximum misalignment of anchors, inserts, openings: 1/8 inch.
- 3.03 Installation
- .01 Verify lines, levels, and measurement before proceeding with formwork.

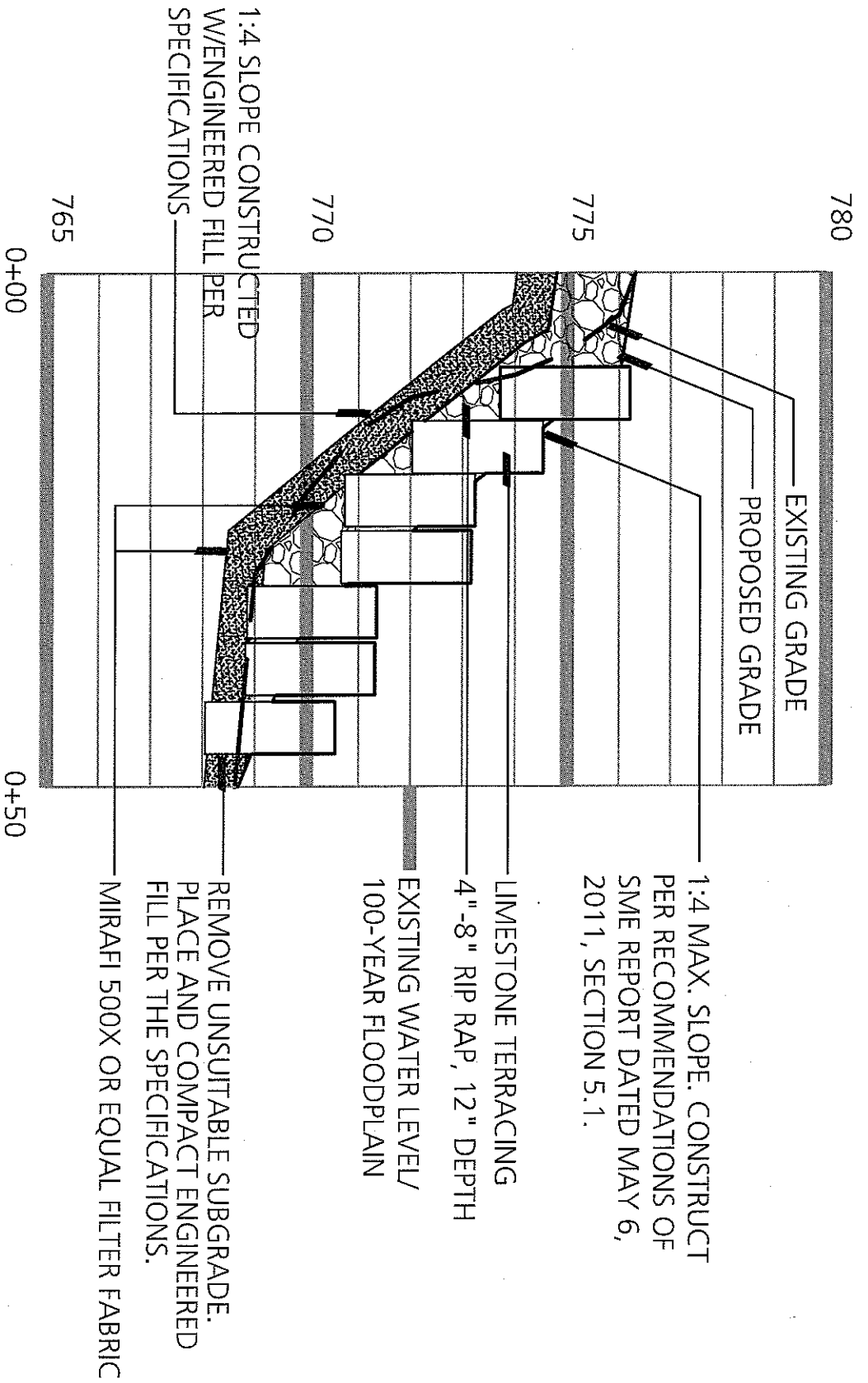
- .02 Hand trim sides and bottom of earth forms; remove loose dirt, wood shavings, trash, ice, snow and water.
- .03 Align form joints, make mortar tight.
- .04 Coat forms with approved form release agent.
- .05 Place, support, and secure reinforcement against displacement.
- .06 Notify Landscape Architect/Engineer minimum 24 hours prior to commencement of concreting operations.
- .07 All exposed concrete surface shall be treated with a liquid membrane-forming curing compound.
- .08 Concrete shall be protected and cured a minimum of seven (7) days.
- .09 Do not use crowbars or other wrecking tools directly against concrete when removing forms.
- .10 Formed surface shall be treated immediately upon removal of forms and at completion of patching.
- .11 Patch mortar shall be same as concrete. except omit coarse aggregate.
- .12 Fill all tie holes solid.

- END OF SECTION -



1 Section thru Existing Embankment

1" = 20' horiz., 1" = 4' vert.
 MDEQ RFI 07.26.11



2

Section thru Existing Embankment

1" = 20' horiz., 1" = 4' vert.
 MDEQ RFI 07.26.11

