

**State of Michigan**  
**Department of Environmental Quality**

Land and Water Management Division  
301 E. Louis Glick Hwy.  
Jackson MI, 49201-1535  
517-780-7690

File No. 07-81-0059-P

Date: September 26, 2007

**PUBLIC NOTICE**

University of Michigan, Occupational Safety & Environmental Health, 1239 Kipke Drive-CSSB, Ann Arbor, Michigan, 48109, has applied to this office for a permit under authority of Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The applicant proposes to replace the temporary bank stabilization and access road stabilization measurements conducted under permit number 07-81-0010-P, near the U of M Hospital. These measures are being taken to stabilize approximately 140 feet of the south bank of the Huron River, and to stabilize the access road to the Nichols Arboretum, upland of the bank stabilization measures. Approximately 58 cubic yards of rip-rap that was previously placed along the toe of the riverbank will be excavated and stockpiled for possible reuse. A vegetated geogrid system, with a compacted stone and sand base, topsoil, and live woody cuttings, will be utilized for bank stabilization. A total of approximately 1,597 cubic yards of material, 589 cubic yards of which will be below the ordinary high water mark, will be removed from the stream bank to prepare for the bank stabilization system. Four vanes constructed from a total of 1,000 cubic yards of rock, ½ of which will be below the ordinary high water mark, will extend into the river from shore and further decrease erosive forces at the toe of the stream bank, thus protecting an additional 240 feet of stream bank. The gravel access road will be shifted away from the Huron River, with run-off directed to a storm sewer system. The project is located in T2S, R6E, Section 28, City of Ann Arbor, Washtenaw County, Michigan, in accordance with plans attached to this notice.

**THIS NOTICE IS NOT A PERMIT**

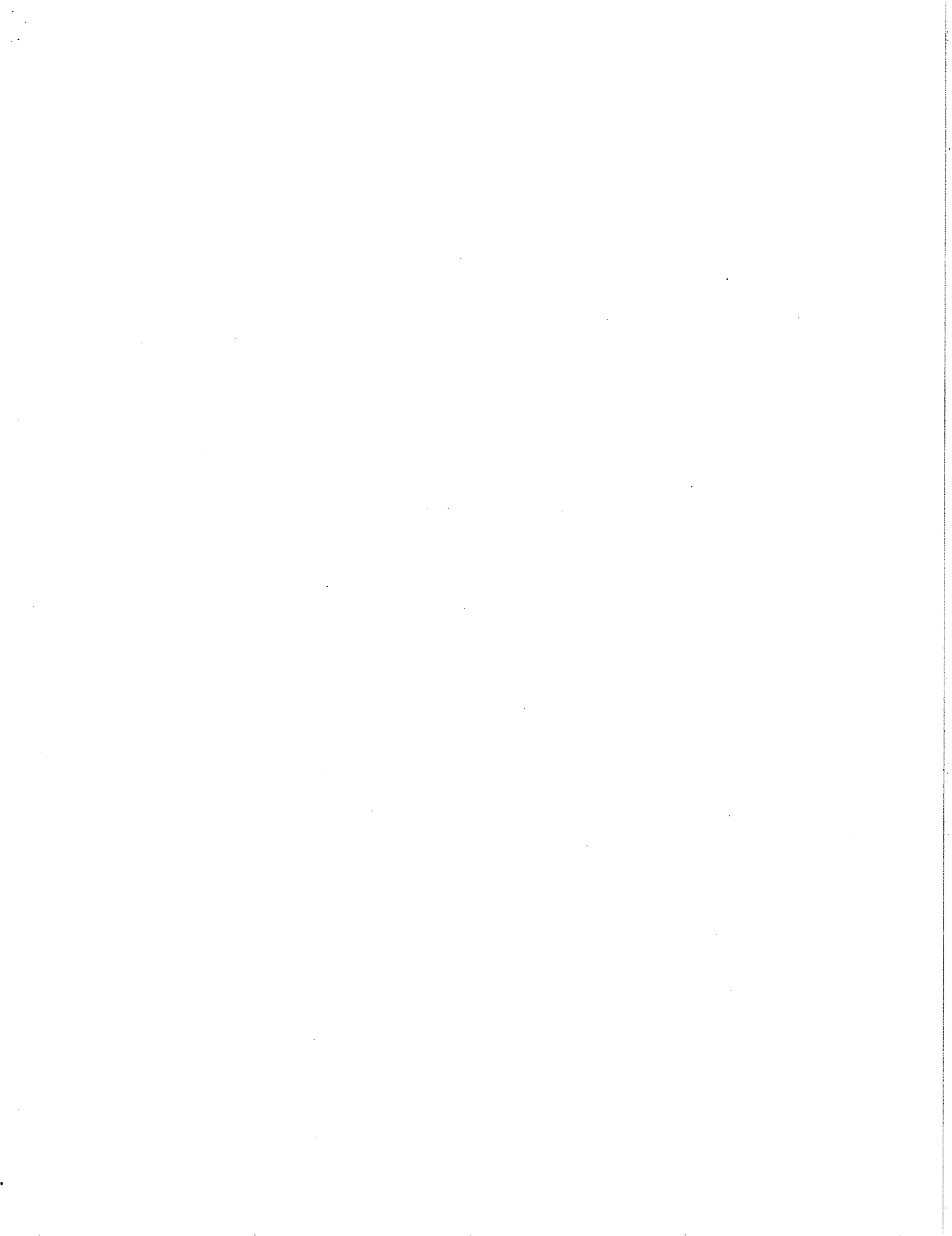
The proposed project may also be regulated by one or more additional parts of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, that are administered by the Land and Water Management Division (LWMD). The requirements of applicable parts are considered in determining if it is in the public interest to issue a permit.

When a permit application is received requesting authorization to work in or over the inland waters of the State of Michigan, pursuant to PART 301, INLAND LAKES AND STREAMS, OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED, the Act provides that the department submit copies for review to the department of public health, the city, village or township, and the county where the project is to be located, the local soil conservation district, any local watershed council organized under Part 311, and the local port commission. Additional notification is provided to certain persons as required by statute or determined by the department.

Those persons wanting to make comments on the proposed project shall furnish this office with their written comments no later than 20 days from the date of this notice. Written comments will be made part of the record and should reference the above file number. Objections must be factual, specific, and fully describe the reasons upon which any objection is founded. Unless a written request is filed with the department within the 20-day public comment period, the department may make a decision on the application without a public hearing. The determination as to whether a permit will be issued or a public hearing held will be based on evaluation of all relevant factors defined in Sections 30106 and 30311, or permit criteria defined by other appropriate Parts of the NREPA. These Sections address the effect of the proposed work on the public trust or interest including navigation, fish, wildlife, and water quality among other criteria. Public comments received will also be considered.

cc: DNR, Natural Heritage  
DNR, Wildlife-Rose Lake  
Washtenaw Co. Clerk  
Washtenaw Co. Drain Comm.  
University of Michigan, applicant  
DEQ, RRD site 81-41,43  
LWMD, Floodplains-Jackson  
Ann Arbor Public Services

DNR, Fisheries-Southfield  
Washtenaw Co. Health Dept.  
City of Ann Arbor Clerk  
Washtenaw Soil Conservation Dist.  
History Division  
Huron River Watershed Council  
Forest Hills Cemetery



AGENCY USE	Previous USACE Permit or File Number	<b>RECEIVED</b> Date Received AUG 10 2007 MDEQ/LWMD PERMIT CONSOLIDATION UNIT	Land and Water Management Division, MDEQ File Number	AGENCY USE	
	USACE File Number		07-81-00598		Marina Operating Permit Number
	JOX James Jillee		Fee received \$		2500 # 25615

• Complete all items in Sections 1 through 9 and those items in Sections 10 through 21 that apply to the project. Clear drawings and cross sections must be provided.

**1 PROJECT LOCATION INFORMATION**

• Refer to your property's legal description for the Township, Range, and Section information, and your property tax bill for your Property Tax Identification Number(s).

Address <b>Nichols Drive, University of Michigan, Nichols Arboretum</b>		Township Name(s) <b>Ann Arbor</b>	Township(s) <b>25</b>	Range(s) <b>6E</b>	Section(s) <b>28</b>
City/Village <b>Ann Arbor</b>	County(ies) <b>Washtenaw</b>	Property Tax Identification Number(s) <b>09-09-28-101-001</b>			
Name of Waterbody <b>Huron River</b>	Project Name or Job Number <b>Nichols Arboretum Access Road- Permanent Stabilization Project</b>	Subdivision/Plat <b>N/A</b>	Lot Number <b>N/A</b>	Private Claim <b>N/A</b>	

Project types (check all that apply)

<input type="checkbox"/> private	<input checked="" type="checkbox"/> public/government	<input type="checkbox"/> industrial	<input type="checkbox"/> commercial	<input type="checkbox"/> multi-family
<input type="checkbox"/> building addition	<input type="checkbox"/> new building or structure	<input type="checkbox"/> building renovation or restoration	<input type="checkbox"/> river restoration	<input type="checkbox"/> single-family
<input checked="" type="checkbox"/> other (explain) <b>Streambank Stabilization</b>				

The proposed project is on, within, or involves (check all that apply)

<input type="checkbox"/> a stream	<input type="checkbox"/> a pond (less than 5 acres)	<input type="checkbox"/> a Great Lake or Section 10 Waters	<input type="checkbox"/> a natural river	<input type="checkbox"/> a new marina
<input checked="" type="checkbox"/> a river	<input type="checkbox"/> a channel/canal	<input type="checkbox"/> a designated high risk erosion area	<input type="checkbox"/> a dam	<input type="checkbox"/> a structure removal
<input type="checkbox"/> a ditch or drain	<input type="checkbox"/> an inland lake (5 acres or more)	<input type="checkbox"/> a designated critical dune area	<input type="checkbox"/> a wetland	<input type="checkbox"/> a utility crossing
<input type="checkbox"/> a floodway area	<input checked="" type="checkbox"/> a 100-year floodplain	<input type="checkbox"/> a designated environmental area	<input type="checkbox"/> 500 feet of an existing waterbody	

**2 DESCRIBE PROPOSED PROJECT AND ASSOCIATED ACTIVITIES, AND THE CONSTRUCTION SEQUENCE AND METHODS**

• Attach separate sheets, as needed, including necessary drawings, sketches, photographs, aerials, or plans.

*The proposed project involves the stabilization of approximately 140' of the south bank of the Huron River. Stabilization will be achieved by reconstructing the stream bank with a vegetated geogrid reinforced slope. In addition to the reconstruction of the slope, four rock vanes are proposed to decrease the erosive velocities and forces at the stream bank, thereby protecting an additional 240 feet of streambank against on-going toe erosion with minimal disturbance. The eroding streambank has compromised the emergency access road into the Nichols Arboretum. The access road is necessary for the University of Michigan to operate facilities in the Arboretum and access for the City of Ann Arbor to a sanitary sewer main if emergency maintenance is required. The gravel access road will be shifted away from the Huron River as it is reconstructed. In order to maintain adequate drainage, the proposed gravel access road will be graded such that runoff will drain westward. A catch basin and drainage pipe will collect the runoff and carry it westward where it will be tied into an existing storm sewer which outlets to the Huron River. It is anticipated that construction will begin immediately after the permit is issued and completed within 6 weeks.*

*Construction will be accomplished using traditional earth moving equipment such as bulldozers, loaders, and excavators. The existing streambank will be excavated mechanically using a tracked excavator. A stone foundation will be installed under the geogrid. The streambank will then be constructed in lifts by placing stone and sand backfill in compacted layers. Live woody cuttings will be incorporated into the soil lifts to establish vegetation.*

**Construction Sequence and Methods:**

1. INSTALL TURBIDITY BARRIER/COFFERDAM AS REQUIRED TO COMPLETE WORK.
2. INSTALL ALL OTHER SESC MEASURES.
3. DEMOLITION WORK AS REQUIRED, INCLUDING STRIPPING AND CLEARING. TIMING OF DEMOLITION WORK TO BE DETERMINED BY CONTRACTOR TO MAINTAIN SITE DRAINAGE AND ACCESS.
4. EXCAVATE FOR REINFORCED SLOPE AND STONE FOUNDATION USING CONVENTIONAL MECHANICAL EXCAVATION METHODS.
5. PLACE FOUNDATION STONE.
6. INSTALL DRAINAGE MAT.
7. CONSTRUCT GEOGRID REINFORCED SLOPE WITH COMPACTED STONE, COMPACTED SAND, GEOGRID REINFORCEMENT, TOPSOIL, AND TURF REINFORCEMENT MAT AND BRUSH LAYERING AS PRESENTED ON THE PROJECT PLANS.
8. INSTALL PLANT PLUGS AND HYDROSEED.

9. AFTER COMPLETION OF COMPACTED BACKFILL, CONSTRUCT ROAD AND DRAINAGE UTILITIES.
10. ADDITIONAL SITE RESTORATION.
11. INSTALL ROCK VANES.
12. ONCE SITE IS STABILIZED, SESC MEASURES MAY BE REMOVED.

The proposed project will require 1,508 cubic yards of fill of which 1,089 are located below the ordinary high water mark (OHWM), and 1,037 cubic yards of excavation of which 619 are located below the OHWM. All of the proposed cut and fill will be located within the 100-year floodplain.

Project plans are attached.

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AUG 10 2007

<b>3 APPLICANT, AGENT/CONTRACTOR, AND PROPERTY OWNER INFORMATION</b>		MDEQ/LWMD PERMIT CONSOLIDATION UNIT	
<ul style="list-style-type: none"> <li>• The applicant can be either the property owner or the person or company that proposes to undertake the activity.</li> <li>• If the applicant is a corporation, both the corporation and its owner must provide a written document authorizing the agent/contractor to act on their behalf.</li> </ul>			
Applicant (individual or corporate name) <i>Timothy R. Cullen, Manager                  Environmental &amp; Hazardous Materials Management                  Occupational Safety &amp; Environmental Health- University of                  Michigan</i>		Agent/Contractor (firm name and contact person) <i>N/A</i>	
Mailing Address <i>1239 Kipke Drive-CSSB</i>		Address	
City <i>Ann Arbor</i>	State <i>MI</i>	Zip Code <i>48109-1010</i>	
Daytime Phone Number with Area Code <i>734-763-5267</i>	Cell Phone Number -	Daytime Phone Number with Area Code -	Cell Phone Number -
Fax <i>734-763-1185</i>	E-mail <i>trcullen@umich.edu</i>	Fax -	E-mail
Is the applicant the sole owner of all property on which this project is to be constructed and all property involved or impacted by this project? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If No, provide a letter signed by the property owner authorizing the agent/contractor to act on his or her behalf or a copy of easements or right-of-ways. If multiple owners, attach all property owners' names, mailing addresses, and telephone numbers. Disclose any DEQ conservation easements or other easements, deed restrictions, leases, or any other encumbrance upon the property in the project area. A copy of the land restriction must be provided.			
Property Owner's Name (if different from applicant) <i>City of Ann Arbor Attn: Jerry Hancock</i>		Mailing Address <i>City of Ann Arbor                  Public Services-Systems Planning Unit                  100 North Fifth Avenue</i>	
Daytime Phone Number with Area Code <i>734-996-3004</i>	Cell Phone Number -	City <i>Ann Arbor</i>	State <i>MI</i> Zip Code <i>48107</i>
<b>4 PROPOSED PROJECT PURPOSE, INTENDED USE, AND ALTERNATIVES CONSIDERED (Attach additional sheets if necessary)</b>			
<ul style="list-style-type: none"> <li>• The purpose must include any new development or expansion of an existing land use.</li> <li>• Include a description of alternatives considered to avoid or minimize resource impacts. Include factors such as, but not limited to, alternative construction technologies; alternative project layout and design; alternative locations; local land use regulations and infrastructure; and pertinent environmental and resource issues.</li> <li>• For utility crossings, include both alternative routes and alternative construction methods.</li> </ul>			
<p><i>The purpose of this project is to stabilize an eroding streambank of the Huron River which is causing damage to an access road and threatens a sanitary sewer owned by the City of Ann Arbor. The purpose will not alter existing landuse. The proposed treatment creates an opportunity to improve riparian habitat which is currently dominated by non-native and invasive plant species. The access road is important for day-to-day operations of the Nichols Arboretum and related University facilities because it provides emergency vehicle access as required by law, and provides access for maintenance vehicles and equipment. The City of Ann Arbor also uses the access road for sanitary sewer maintenance. An alternative access route is not available. Due to the importance of the access drive and site constraints a 1:1 streambank slope must be maintained. Therefore, reinforcing the slope is required. The proposed geogrid reinforced slope allows vegetation to be established and the most environmentally sensitive option that still provides the level of structural slope stability that is required. The geogrid is proposed to stabilize 140 feet of streambank. An additional 280 feet of streambank will be protected against on-going toe erosion using four (4) rock vanes. The rock vanes are transverse structures that extend into the Huron River rather than along the streambank. Rock vanes result in less impact to the environment than longitudinal structures.</i></p>			
<p><i>Alternatives Considered:                  Due to the importance of the access route, it is not feasible or prudent to not treat the streambank erosion. Furthermore, a suitable alternative location for an access route is not available. Due to the space constraints at this site, a vertical,</i></p>			

structural approach is required to stabilize the streambank slope. Softer approaches such as bioengineering and whole tree revetment cannot stabilize a 1:1 slope or provide the long-term protection that is required for this critical access road. Alternatives considered that could provide the durability and longevity required included a vertical geocell wall, gabion baskets, riprap, and geogrid. Of those alternatives, the geogrid has the least environmental impact and offers the best opportunity to establish natural riparian vegetation and create valuable riparian habitat.

The University of Michigan recently obtained permit no. 07-81-0010-P for emergency streambank stabilization at the currently proposed project site. The MDNR sent UM a notice letter for the presence of a threatened plant species, *Panicum leibergii*. The UM responded to that notice with information about the threatened plant species which occurs in a prairie maintained by the UM and received a clearance letter from the MDNR for permit no. 07-81-0010-P. The information sent by UM along with correspondence and the MDNR clearance letter are enclosed with this application. The currently proposed project is at the same location as the project site under permit no. 07-80-0010-P. The plant is far removed from the currently proposed project site. Therefore, the threatened plant will not be impacted by the proposed project.

**5 LOCATING YOUR PROJECT SITE**

- Provide the requested information listed below to help staff locate your project site.
- Attach a copy of a map, such as a plat, county, or USGS topographic map, clearly showing the site location and include an arrow indicating the north direction.
- Project area must be staked at the time of application submittal.

Is there an access road to the project?  No  Yes (If Yes, type of road, check all that apply)  private  public  improved  unimproved

Name of roads at closest main intersection *E. Medical Ctr Dr* and *Fuller Road*

Directions from main intersection *East of Fuller Road, South on E. Medical Center Drive*

Style of house or other building on site  ranch  2-story  cape cod  bi-level  cottage/cabin  pole barn  none  other (describe)

Color *N/A* Color of adjacent property house and/or buildings *N/A*

House number *N/A* Address is visible on  house  garage  mailbox  sign  other (describe) *Look for trail head*

Street name *E. Medical Center Drive* Fire lane number *N/A* Lot number *N/A*

How can your site be identified if there is no visible address? *Adjacent to UofM Hospital. There is a gate and Nichols Arboretum Sign.*

Provide directions to the project site, with distances from the best and nearest visible landmark and waterbody *From Fuller Road travel south on E. Medical Center Drive (M29-Nichols Rd.) for approximately 0.5 mi. Travel around the UofM Hospital to a small parking lot that leads to a trailhead for Nichols Arboretum. See attached maps. There is limited access to Nichols Drive in the Arboretum. Contact Mike Hommel, UM Mathaei Botanical Gardens/ Nichols Arboretum (phone 734-998-7061) to arrange access.*

Does project cross boundaries of two or more political jurisdictions? (City/Township, Township/Township, County/County, etc.)

No  Yes (If Yes, list jurisdiction names.)

**6 List all other federal, interstate, state, or local agency authorizations required for the proposed activity, including all approvals or denials received.**

Agency	Type approval	Identification number	Date applied	Date approved / denied	If denied, reason for denial
<i>University of Michigan</i>	<i>SESC</i>		<i>Pending</i>	<i>Pending</i>	
<i>OSEH</i>					

**7 If a permit is issued, date activity will commence (M/D/Y) *10/1/2007 (or ASAP)***

Proposed completion date (M/D/Y) *6/30/2008*

Has any construction activity commenced or been completed in a regulated area?  No  Yes

If Yes, identify the portion(s) underway or completed on drawings or

attach project specifications and give completion date(s) (M/D/Y) *May/ 8/ 2007*

Were the regulated activities conducted under a MDEQ permit?  No  Yes

If Yes, list the MDEQ permit number *07-81-0010-P*

Are you aware of any unresolved violations of environmental law or litigation involving the property?  No  Yes (If Yes, explain)

**8 PUBLIC NOTIFICATION (Attach additional sheets if necessary)**

- Complete information for all adjacent and impacted property owners and the lake association or established lake board, including the contact person's name.
- If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.

Property Owner's Name	Mailing Address	City	State	Zip Code
<i>University of Michigan (T. Alexander)</i>	<i>1239 Kipke Drive</i>	<i>Ann Arbor</i>	<i>MI</i>	<i>48109-1010</i>
<i>Forest Hills Cemetery</i>	<i>415 Observatory</i>	<i>Ann Arbor</i>	<i>MI</i>	<i>48104</i>
<i>City of Ann Arbor (J. Hancock)- Public Services/ Sys. Plan.</i>	<i>100 N. Fifth Avenue</i>	<i>Ann Arbor</i>	<i>MI</i>	<i>48107</i>

Name of  Established Lake Board  or Lake Association and the Contact Person's name, phone number, and mailing address *N/A*

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**9 APPLICANT'S CERTIFICATION READ CAREFULLY BEFORE SIGNING**

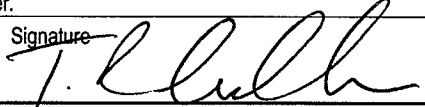
I am applying for a permit(s) to authorize the activities described herein. I certify that I am familiar with the information contained in this application, that it is true and accurate, and, to the best of my knowledge, is in compliance with the State Coastal Zone Management Program and the National Flood Insurance Program. I understand

*AUG 10 2007*



that there are penalties for submitting false information and that any permit issued pursuant to this application may be revoked if information on this application is untrue. I certify that I have the authority to undertake the activities proposed in this application. By signing this application, I agree to allow representatives of the MDEQ, USACE, and/or their agents or contractors to enter upon said property in order to inspect the proposed activity site and the completed project. I understand that I must obtain all other necessary local, county, state, or federal permits and that the granting of other permits by local, county, state, or federal agencies does not release me from the requirements of obtaining the permit requested herein before commencing the activity. I understand that the payment of the application fee does not guarantee the issuance of a permit.

- All applicants must complete all of the items in Sections 1 through 9 on pages 1 and 2 of this application.
- Complete those items in Sections 10 through 21 that apply to the project. Submit only those pages where you have provided information.
- Your application will not be processed if the application form is not completely filled out.
- List here the application page numbers being submitted and a brief description of other attachments included with your application. **1-5, 7, & 8; T&E Species Info.; Five sets of 11x17 Drawings; 1 set of 8.5x11 Drawings; \$500 application fee (Corporate Check)**
- Submit 8.5" by 11," 8.5" by 14" or 11" by 17" size drawings with 4 copies. The USACE requires one set of drawings on 8.5" x 11" paper, with all notations clearly legible. Larger copies may be submitted in addition to the standard size copies.
- A letter of authorization from the owner must be included if not signed below by the owner.

<input type="checkbox"/> Property Owner <input checked="" type="checkbox"/> Agent/Contractor <input type="checkbox"/> Corporation - Title	Printed Name  <i>Timothy R. Cullen</i>	Signature 	Date (M/D/Y)  8/7/07
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PERMIT CONSOLIDATION UNIT

**10 PROJECTS IMPACTING WETLANDS OR FLOODPLAINS OR LOCATED ON AN INLAND LAKE OR STREAM OR A GREAT LAKE**

- Check boxes A through N that may be applicable to your project and provide the requested information.
- If your project may affect wetlands, also complete Section 12. If your project may impact regulated floodplains, also complete Section 13.
- Provide an overall site plan showing existing lakes, streams, wetlands, and other water features; existing structures; and the location of all proposed structures, land change activities and soil erosion and sedimentation control measures. Review sample drawings for guidance in completing site-specific drawings for your project.
- Some projects on the Great Lakes require an application for conveyance prior to Joint Permit Application completeness.
- On a Great Lake use IGLD 85  surveyed  converted from observed still water elevation. On inland waters,  NGVD 29  local datum  other **NAVD88**
- Observed water elevation (ft) **751.5**, date of observation (MD/Y) **01/03/07**

**A. PROJECTS REQUIRING FILL** (See All Sample Drawings)

- To calculate volume in cubic yards (cu yd), multiply the average length in feet (ft) times the average width (ft) times the average depth (ft) and divide by 27.
- Attach both plan and cross-section views to scale showing maximum and average fill dimensions.

(Check all that apply)  floodplain fill  wetland fill  riprap  seawall, bulkhead, or revetment  bridge or culvert  
 boat launch  off-shore swim area  beach sanding  boatwell  crib dock  other

Fill dimensions (ft)  
 Length **See Table 1 (Attached)** width maximum depth Total fill volume (cu yd) **1508** Maximum water depth in fill area (ft) **4.5**

Type of clean fill  pea stone  sand  gravel  wood chips  other **Rock Vane, Top Soil, Stone Fill, Sand Fill** Will filter fabric be used under proposed fill?  No  Yes (If Yes, type) **Non Woven Geotextile**

Source of clean fill  on-site, if on-site, show location on site plan  commercial  other, if other, attach description of location  
 Fill will extend **3** feet into the water from the shoreline and upland **12** feet out of the water. Fill volume below OHWM (cu yd) **1089**

**B. PROJECTS REQUIRING DREDGING OR EXCAVATION** (For dredging projects see Sample Drawing 7, for excavation see other applicable Sample Drawings)

- To calculate volume in cubic yards (cu yd), multiply the average length in feet (ft) times the average width (ft) times the average depth (ft) and divide by 27.
- Attach both plan and cross-section views to scale showing maximum and average dredge or excavation dimensions.
- The applicant will be notified if sediment sampling is required.

(Check all that apply)  floodplain excavation  wetland dredge or draining  seawall, bulkhead, or revetment  
 navigation  boat well  boat launch  other **Excavation for construction of vegetated mechanically stabilized earth (VMSE) wall**

Total dredge/excavation volume (cu yd) **1037** Dimensions length **See Table 1, Attached** Dredge/excavation volume below OHWM (cu yd) **619** Method and equipment for dredging **Excavator for excavation**  
 width depth

Has proposed dredge material been tested for contaminants?  No  Yes (If Yes, attach testing results) Will dredged or excavated spoils be placed  on-site  off-site. Attach a detailed disposal area site plan, location map. If dispose off site, provide address and letter of authorization.

Has this same area been previously dredged?  No  Yes (If Yes, provide date and permit number, if available) / / /  
 If Yes, are you proposing to enlarge the previously dredged area  No  Yes

Is long-term maintenance dredging planned?  No  Yes (If Yes, when and how much?)

**C. PROJECTS REQUIRING RIPRAP** (See Sample Drawings 2, 3, 8, 12, 14, 17, 22, and 23. Others may apply)

Riprap waterward of the  shoreline OR  ordinary high water mark Dimensions (ft) length width depth Volume(cu yd)  
 Riprap landward of the  shoreline OR  ordinary high water mark Dimensions length width depth Volume(cu yd)  
 Type of riprap  field stone  angular rock  other Will filter fabric be used under proposed riprap?  No  Yes (If Yes, type)

**D. SHORE PROTECTION PROJECTS** (See Sample Drawings 2, 3, and 17)  
 (check all that apply)  riprap - length (ft.)  seawall/bulkhead - length (ft.)  revetment - length (ft.) **130** Distances of project from both property lines (ft) **N/A**

**E. DOCK - PIER - MOORING PILINGS** (See Sample Drawing 10)  
 Type  open pile  filled  crib Seasonal structure?  No  Yes  
 Proposed structure dimensions (ft) length width Dimensions of nearest adjacent structures (ft) length width

**F. BOAT WELL** (No Sample Drawing available)  
 Type of bank stabilization  wood  steel  concrete  vinyl  riprap  other  
 Boat well dimensions (ft) Length width depth Number of boats  
 Volume of backfill behind sidewall stabilization (cu yd) Distances of boat well from adjacent property lines (ft)

**G. BOAT LAUNCH** (No Sample Drawing available) (check all that apply)  new  existing  public  private  commercial  replacement  
 Proposed overall boat launch dimensions (ft) length width depth **AUG 10 2007** Type of material  concrete  wood  stone  other  
 Existing overall boat launch dimensions (ft) Length width depth MDEQ/LWMD Boat launch dimensions (ft) below ordinary high water mark Length width depth  
 Distances of launch from both property lines (ft) PERMIT CONSOLIDATION UNIT Number of skid piers Skid pier dimensions (ft) width length

**H. BOAT HOIST** (No Sample Drawing available)  
 (Check all that apply)  seasonal  permanent  cradle  side lifter  other located on  seawall  dock  bottomlands



**13 FLOODPLAIN ACTIVITIES** (See Sample Drawing 5. Others may apply.)

- Attach additional sheets with the requested information when multiple *floodplain* activities are included in this application.

(check all that apply)  fill     excavation     other

Site is **12.5** feet above  ordinary high water mark (OHWM) OR  observed water level. Date of observation (M/D/Y) **12/20/2006**

Fill volume below the 100-year floodplain elevation (cu yd) <b>1508</b>	Compensating cut volume below the 100-year floodplain elevation (cu yd) <b>1037</b>
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**14 BRIDGES AND CULVERTS** (Including Foot and Cart Bridges)

- Provide detailed site-specific drawings of existing and proposed *Plan View* (Sample Drawing 14A), *Elevation View* (Sample Drawing 14B), *Stream and Floodplain Cross-Section* (Sample Drawing 14C), *Stream Profile* (Sample Drawing 14D) and *Floodplain Fill* (Sample Drawing 5) at a scale adequate for detailed review.
- Provide the requested information that applies to your project. If there is not an existing *structure*, leave the "Existing" column blank.
- If you choose to have a Licensed Professional Engineer "certify" that your project will not cause a "harmful interference" for a range of flood discharges up to and including the 100-year flood discharge, then you must use the "Required Certification Language." You may request a copy by phone, email, or mail. A hydraulic report supporting this certification may also be required.
- Attach additional sheets with the requested information when multiple crossings are included in this application.

		Existing	Proposed			Existing	Proposed
Culvert type (box, circular, arch) and material (corrugated metal, timber, concrete, etc.)	<b>RECEIVED</b>			Bridge span (length perpendicular to stream) OR culvert <input type="checkbox"/> width <input type="checkbox"/> diameter (ft)			
Bridge type (concrete box beam, timber, concrete I-beam, etc.)	<b>AUG 10 2007</b>			Bridge width (parallel to stream) OR culvert length (ft)			
Entrance design (projecting, mitered, wingwalls, etc.)	<b>MDEQ/LWMD PERMIT CONSOLIDATION UNIT</b>			Bridge rise (from bottom of beam to streambed) OR Culvert rise (from top of culvert to streambed) (ft)			
Total structure waterway opening above streambed (sq ft)							
<input type="checkbox"/> elevation of culvert crown	Upstream			Higher elevation of <input type="checkbox"/> culvert invert OR <input type="checkbox"/> streambed within culvert (ft)	Upstream		
<input type="checkbox"/> bottom of bridge beam (ft)	Downstream				Downstream		
Elevation of road grade at structure (ft)				Distance from low point of road to mid-point of bridge crossing (ft)			
Elevation of low point in road (ft)							
Cross-sectional area of primary channel (sq ft) (See Sample Drawing 14C)				Average stream width at OHWM outside the influence of the structure (ft)	Upstream		Downstream
Reference datum used (show on plans with description) <input type="checkbox"/> NGVD 29 <input type="checkbox"/> IGLD 85 (Great Lakes coastal areas) <input type="checkbox"/> local							
High water elevation – describe reference point and highest known water level above or below reference point and date of observation.							

**15 STREAM, RIVER, OR DRAIN CONSTRUCTION ACTIVITIES** (No sample drawing available)

- Complete Section 10A for fill, Section 10B for dredge or excavation, and Section 10C for *riprap* activities.
- If side casting or other proposed activities will impact wetlands or *floodplains*, complete Sections 12 and 13, respectively.
- Provide an overall site plan showing existing lakes, streams, wetlands, and other water features; existing *structures*; and the location of all proposed *structures* and land change activities. Provide *cross-section* (elevation) drawings necessary to clearly show existing and proposed conditions. Be sure to indicate drawing scales.
- For activities on legally established county drains, provide original design and proposed dimensions and elevations.

(check all that apply)  maintenance     improvement     relocation     enclosure     new drain     wetlands     other

Dimensions (ft) of existing stream/drain channel to be worked on. length	width	depth
Dimensions (ft) of new, relocated, or enclosed stream/drain channel. length	width	depth
Existing channel average water depth in a normal year (ft)	Proposed side slopes (vertical / horizontal)	
How will slopes and bottom be stabilized?		
Will old/enclosed stream channel be backfilled to top of bank grade? <input type="checkbox"/> No <input type="checkbox"/> Yes	Length of channel to be abandoned (ft)	Volume of fill (cu yds)
If an enclosed structure is proposed, check type <input type="checkbox"/> concrete <input type="checkbox"/> corrugated metal <input type="checkbox"/> plastic <input type="checkbox"/> other	Dimensions of the structure size length volume of fill	
Will spoils be disposed of on site? <input type="checkbox"/> No <input type="checkbox"/> Yes (If Yes, show location of spoils on site plan in an <i>upland</i> area.)		
Reference datum used (show on plans with description) <input type="checkbox"/> NGVD 29 <input type="checkbox"/> IGLD 85 (Great Lakes coastal areas) <input type="checkbox"/> local		





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**Nichols Arboretum Stream Bank Stabilization**

Table 1: Proposed Impacts

**Floodplain Fill Quantities (to supplement part 10A of Permit Application)**

**Within Floodplain (100 Year Flood Elevation, 757):**

Material	Sheet Number Referenced	Width	Height	Length	Volume	
		(ft)	(ft)	(ft)	(cf)	(cy)
Rock Vane 1	Sheet 7	9	6	64	3456	128
Rock Vane 2	Sheet 7	9	6	62	3348	124
Rock Vane 3	Sheet 7	9	6	67	3618	134
Rock Vane 4	Sheet 7	9	6	57	3078	114
Top Soil at Stream Bank	Sheet 8	0.33	7	130	300.3	11.122
Stone Fill at Toe of Stream Bank	Sheet 8	9	6	130	7020	260
Sand Fill at Stream Bank	Sheet 8	17	6	130	13260	491.11
Stone Fill at Stream Bank	Sheet 8	17	3	130	6630	246

Total (cy)=  
500

Total (cy)=  
1008

Total (cy) 1508

**Below OHWM (EI 753)**

Material	Sheet Number Referenced	Width	Height	Length	Volume	
		(ft)	(ft)	(ft)	(cf)	(cy)
Rock Vane 1	Sheet 7	9	6	64	3456	128
Rock Vane 2	Sheet 7	9	6	62	3348	124
Rock Vane 3	Sheet 7	9	6	67	3618	134
Rock Vane 4	Sheet 7	9	6	57	3078	114
Top Soil at Stream Bank	Sheet 8	0.33	1	130	42.9	2
Stone Fill at Toe of Stream Bank	Sheet 8	9	6	130	7020	260
Sand Fill at Stream Bank	Sheet 8	17	2	130	4420	164
Stone Fill at Stream Bank	Sheet 8	17	2	130	4420	164

Total (cy)=  
500

Total (cy)=  
589

Total (cy) 1089

**Floodplain Excavation Quantities (to supplement part 10B of Permit Application)**

**Within Floodplain (100 Year Flood Elevation, 757):**

Material	Sheet Number Referenced	Width	Height	Length	Volume	
		(ft)	(ft)	(ft)	(cf)	(cy)
Temporary Rip Rap	Sheet 3	7.5	1.5	70	787.5	29
Excavation for Construction of Reinforced Slope	Sheet 8	17	12.31	130	27205.1	1008

Total (cy)= 1037

**Below OHWM (EI 753)**

Material	Sheet Number Referenced	Width	Height	Length	Volume	
		(ft)	(ft)	(ft)	(cf)	(cy)
Temporary Rip Rap	Sheet 3	7.5	1.5	70	787.5	29
Excavation for Construction of Reinforced Slope	Sheet 8	17	7.2	130	15912	589

Total (cy)= 619

# LAND IMPROVEMENTS - NICHOLS ARBORETUM ACCESS ROAD STREAMBANK STABILIZATION

UM PROJECT NO. P00001715

BLDG. NO. 9965



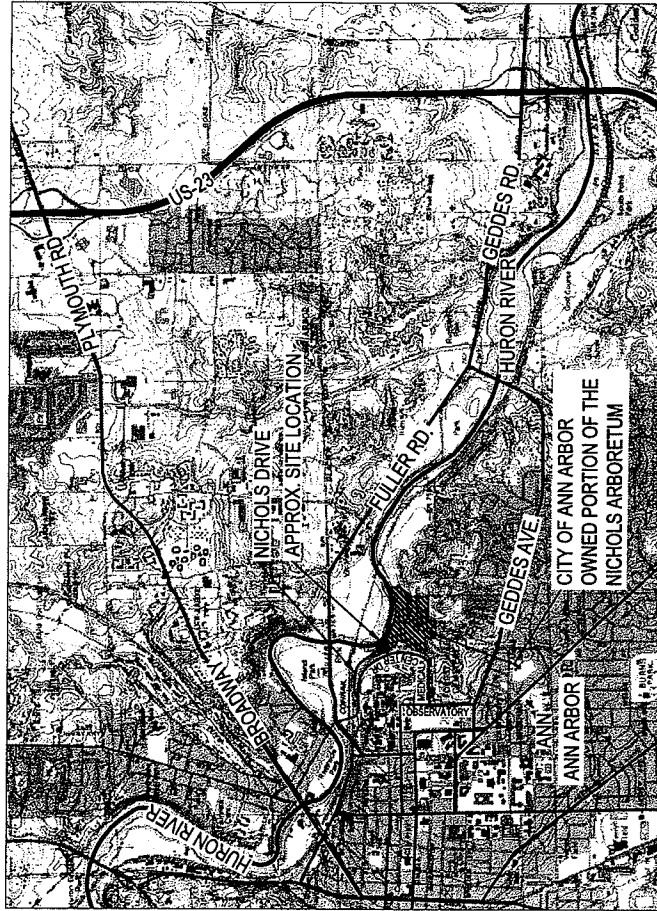
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ANN ARBOR, MICHIGAN

PERMANENT STABILIZATION  
MDEQ/USACE JOINT APPLICATION FOR PERMIT - JULY 2007

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SITE LOCATION MAP  
NOT TO SCALE

USGS TOPOGRAPHIC SURVEY  
NAD83

**DRAWING INDEX**

1. COVER SHEET
2. EXISTING CONDITIONS- PLAN
3. EXISTING CONDITIONS- CROSS-SECTIONS
4. SITE PREPARATION, SOIL EROSION & SEDIMENT CONTROL, AND DEMOLITION PLAN
5. OVERALL SITE PLAN
6. ROAD AND STREAM BANK PLAN DETAIL
7. ROCK VANE DETAILS
8. CROSS-SECTIONS & DETAILS
9. LANDSCAPING PLAN
10. DRAINAGE DETAILS

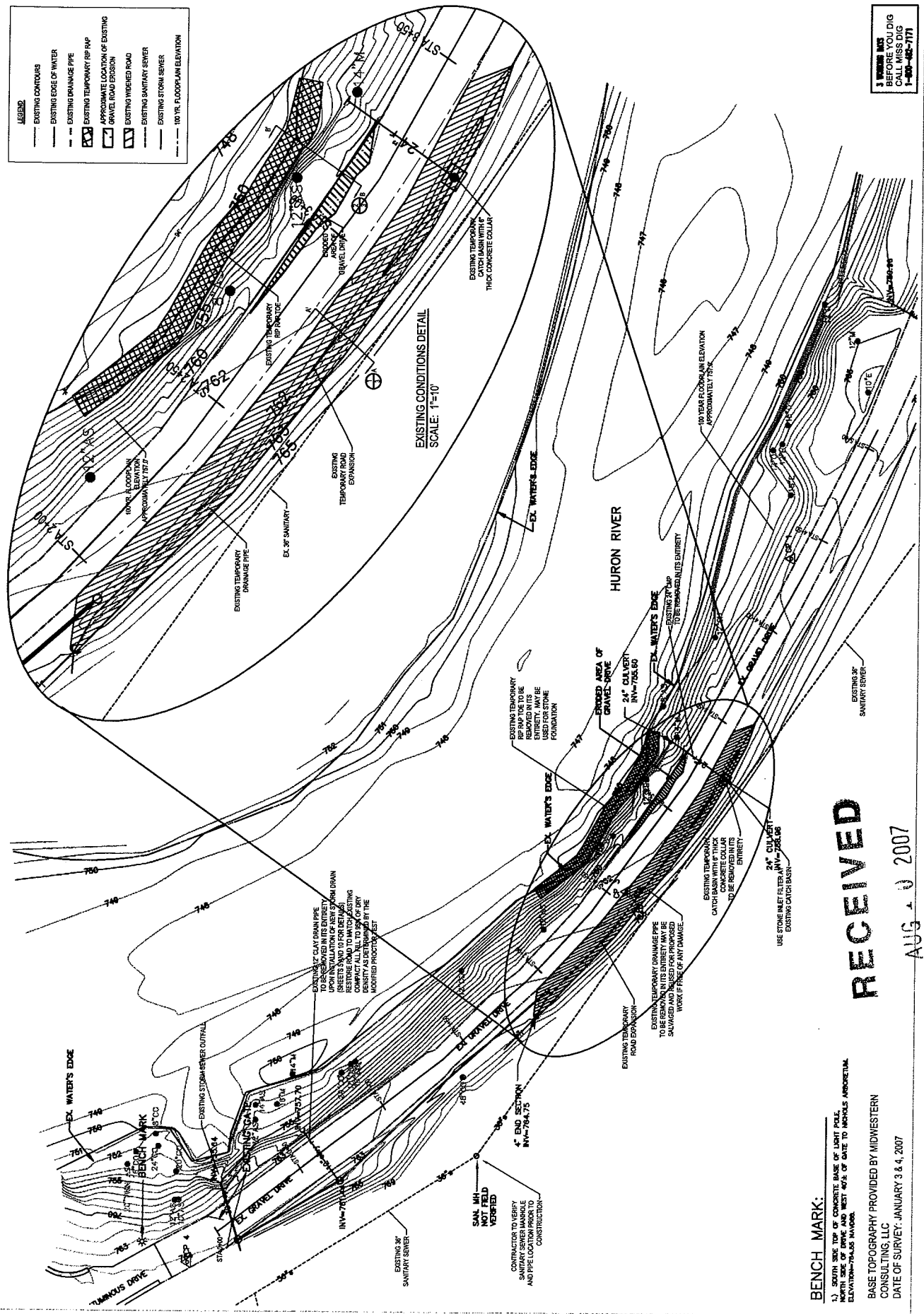
PREPARED BY:



Environmental Consulting & Technology, Inc.  
200  
Ann Arbor, Michigan 48106  
Phone: 734.769.3204 Fax: 734.769.3184

**LEGEND**

	EXISTING CONTOURS
	EXISTING EDGE OF WATER
	EXISTING DRAINAGE PIPE
	EXISTING TEMPORARY RIP RAP
	APPROXIMATE LOCATION OF EXISTING GRAVEL ROAD EXPANSION
	EXISTING WINDERED ROAD
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	100 YR. FLOODPLAIN ELEVATION



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**BENCH MARK:**

- 1. SOUTH SIDE TOP OF CONCRETE BASE OF LIGHT BULB NORTH SIDE OF DRIVE AND WEST 40% OF DRIVE TO NICHOLS ARBORETUM. ELEVATION=78.55 MAND.

BASE TOPOGRAPHY PROVIDED BY MIDWESTERN CONSULTING, LLC  
 DATE OF SURVEY: JANUARY 3 & 4, 2007

CONTRACTOR TO VERIFY SANITARY SEWER MANHOLE AND PIPE LOCATION AND CONSTRUCTION

4" END SECTION INV=78.475

24" DIA. BENT INV=78.46

EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

EXISTING TEMPORARY DRAINAGE PIPE TO BE REMOVED IN ITS ENTIRETY MAY BE SALVAGED AND REUSED FOR PROPOSED WORK IF FREE OF ANY DAMAGE

EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

EXISTING TEMPORARY DRAINAGE PIPE TO BE REMOVED IN ITS ENTIRETY

24" DIA. BENT INV=78.46

EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

EXISTING TEMPORARY DRAINAGE PIPE TO BE REMOVED IN ITS ENTIRETY

24" DIA. BENT INV=78.46

EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

EXISTING TEMPORARY DRAINAGE PIPE TO BE REMOVED IN ITS ENTIRETY

24" DIA. BENT INV=78.46

EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

EXISTING TEMPORARY DRAINAGE PIPE TO BE REMOVED IN ITS ENTIRETY

24" DIA. BENT INV=78.46

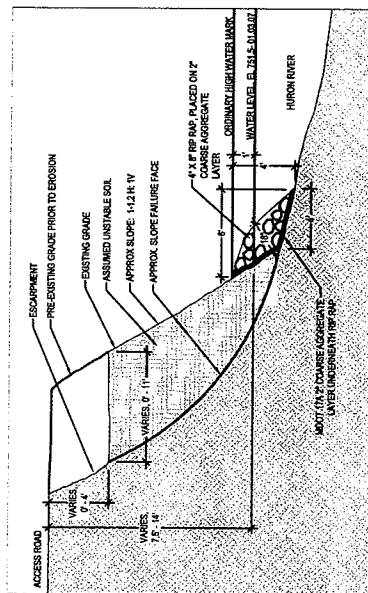
EXISTING TEMPORARY CATCH BASIN WITH 1\"/>

PROJECT NO.	P0600715
DATE	11/12/07
DESIGNED BY	AD
CHECKED BY	AD
INVESTIGATED BY	AD
DATE	11/12/07

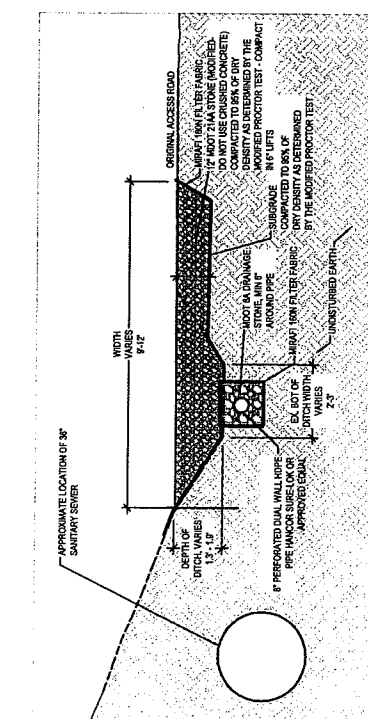
SHEET NAME  
**EXISTING CONDITIONS -  
 CROSS-SECTIONS**

AS BOUND  
 DATE  
 11/12/07  
 SHEET NUMBER  
**3**

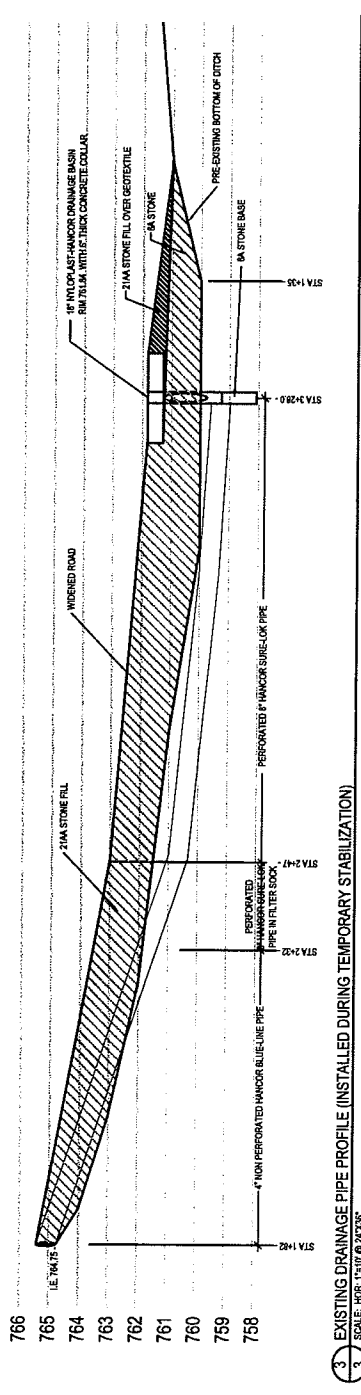
FOR MORE INFO  
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 CALL MISS DIG  
 1-800-485-7171



SECTION A-A  
 SCALE: 1"=2'



SECTION B-B  
 SCALE: 1"=2'



EXISTING DRAINAGE PIPE PROFILE (INSTALLED DURING TEMPORARY STABILIZATION)  
 SCALE: HOR. 1"=10' @ 24'X26"  
 VERT. 1"=2' @ 24'X26"

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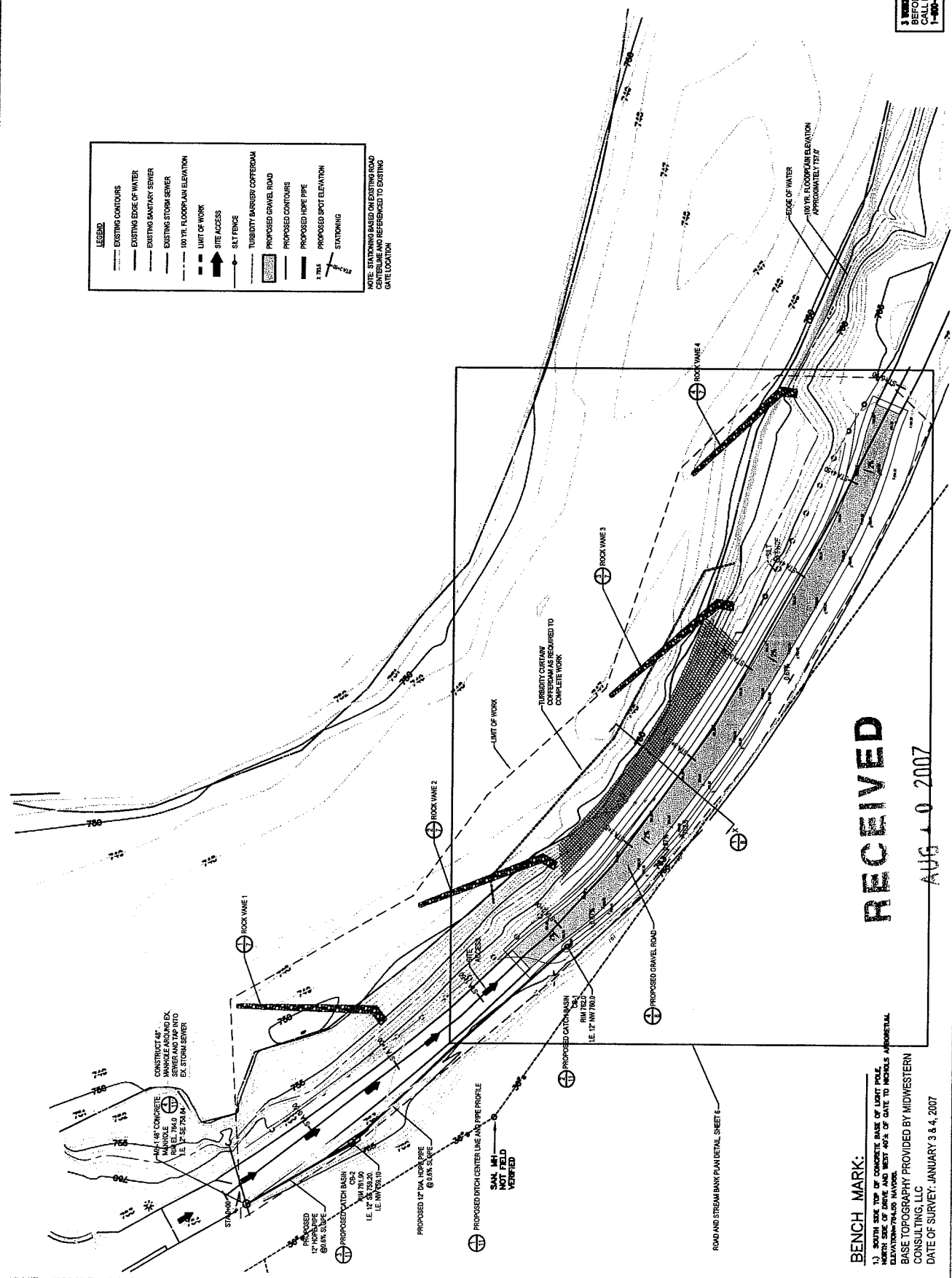


**3 WEEKS AHEAD  
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 1-800-485-7171**

**LEGEND**

- EXISTING CONTOURS
- EXISTING EDGE OF WATER
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- 100 YR. FLOODPLAIN ELEVATION
- LIMIT OF WORK
- SITE ACCESS
- SALT FENCE
- TURBIDITY BARRIER/CORRYDAM
- PROPOSED GRAVEL ROAD
- PROPOSED CONTOURS
- PROPOSED HOPE PIPE
- PROPOSED SPOT ELEVATION
- STATIONING

NOTE: STATIONING BASED ON EXISTING ROAD CENTERLINE AND REFERENCED TO EXISTING GATE LOCATION



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**BENCH MARK:**  
 1. SOUTH SIDE TOP OF CONCRETE BASE OF LIGHT POLE, ELEVATION=751.00  
 2. WEST 40% OF GATE TO NICHOLS ARBORETUM, ELEVATION=751.00  
 3. BASE TOPOGRAPHY PROVIDED BY MIDWESTERN CONSULTING LLC  
 DATE OF SURVEY: JANUARY 3 & 4, 2007

**ECT**  
 Environmental Consulting & Technology, Inc.  
 280 CONCORDIA DRIVE, SUITE 300  
 ANN ARBOR, MI 48108  
 TEL: 734-769-3004  
 FAX: 734-769-3164  
 www.ectinc.com

**LAND IMPROVEMENTS  
 NICHOLS ARBORETUM  
 ACCESS ROAD  
 STREAMBANK STABILIZATION**  
 THE UNIVERSITY OF MICHIGAN  
 ANN ARBOR, MICHIGAN

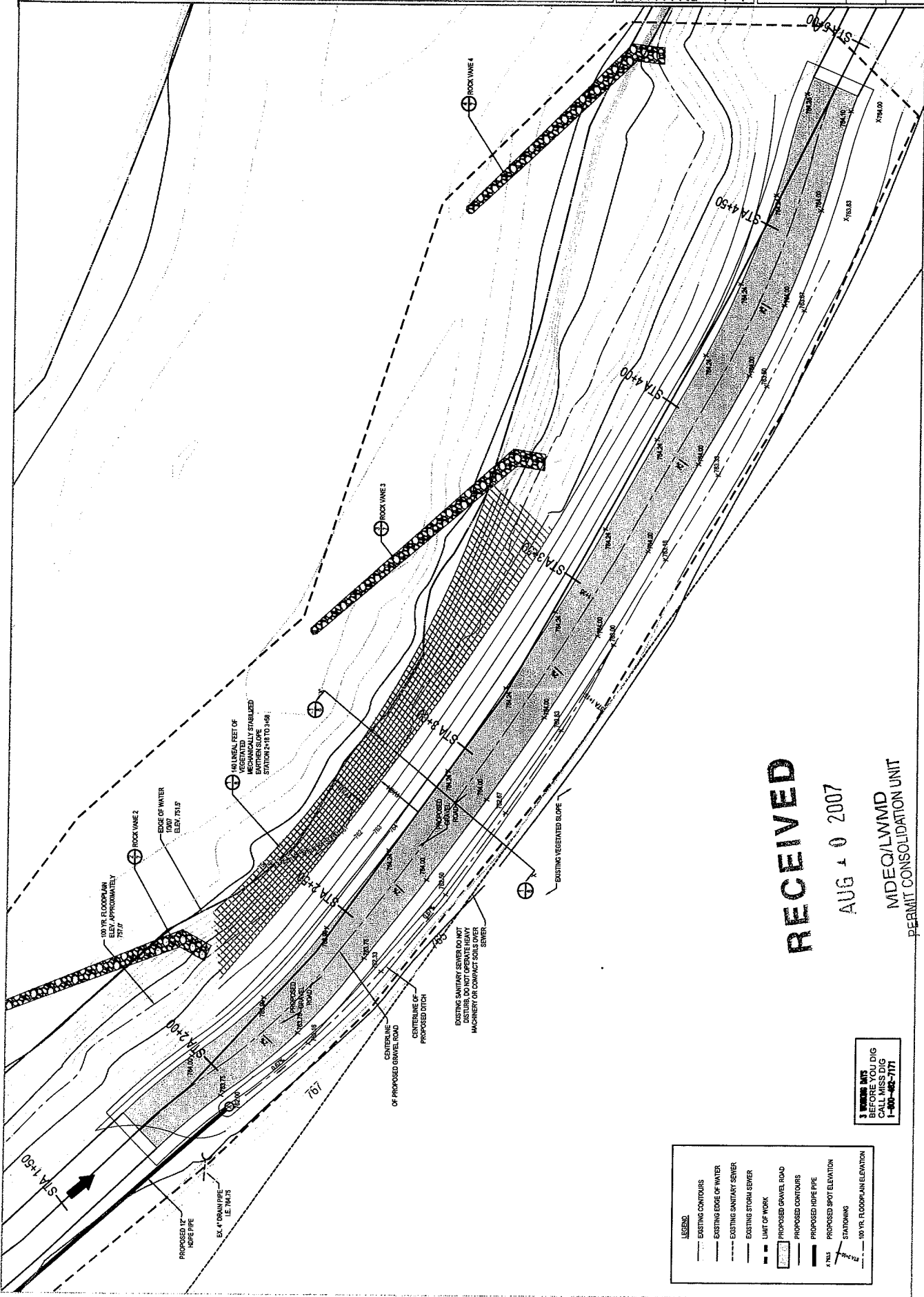
UIN PROJECT NO. PD000715  
 BLDG. NO. 985

DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE

SHEET NAME  
**ROAD AND STREAM BANK  
 PLAN DETAIL**



SHEET NUMBER  
**6**



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 PERMIT CONSOLIDATION UNIT

3 WORKING DAYS BEFORE YOU DIG  
 CALL 811 OR 1-800-482-7171

**LEGEND**

(Symbol)	EXISTING CONTOURS
(Symbol)	EXISTING EDGE OF WATER
(Symbol)	EXISTING SANITARY SEWER
(Symbol)	EXISTING STORM SEWER
(Symbol)	LIMIT OF WORK
(Symbol)	PROPOSED GRAVEL ROAD
(Symbol)	PROPOSED CONTOURS
(Symbol)	PROPOSED HDPE PIPE
(Symbol)	PROPOSED SPOT ELEVATION
(Symbol)	STATIONING
(Symbol)	100 YR. FLOODPLAIN ELEVATION



Environmental Consulting & Technology, Inc.  
 2200 COMMONWEALTH BLVD.,  
 SUITE 300  
 ANN ARBOR, MI 48106  
 PHONE: 734-769-8100  
 FAX: 734-769-3104  
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LAND IMPROVEMENTS  
 NICHOLS ARBORETUM  
 ACCESS ROAD  
 STREAMBANK STABILIZATION

THE UNIVERSITY OF MICHIGAN  
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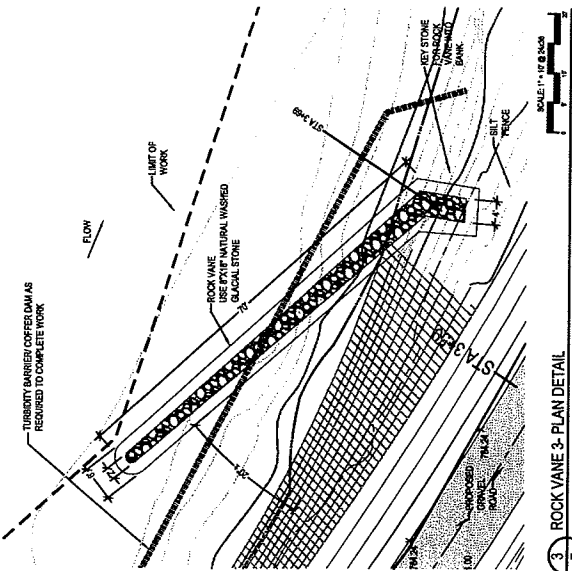
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 BLDG. NO. 5955

DATE: 11/20/06  
 REVISION: 1  
 PREPARED BY: J. J. JENSEN  
 CHECKED BY: J. J. JENSEN  
 DESIGNED BY: J. J. JENSEN  
 DRAWN BY: J. J. JENSEN

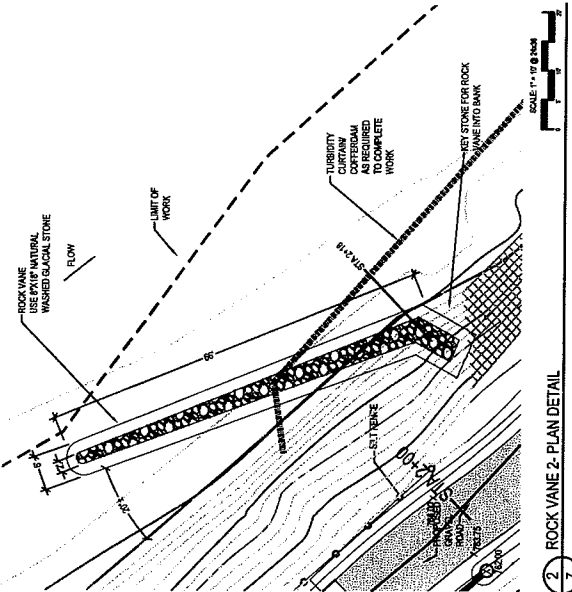
SHEET NAME  
 ROCK VANE  
 DETAILS

SCALE: 1" = 10' @ 20' MAX  
 NORTH

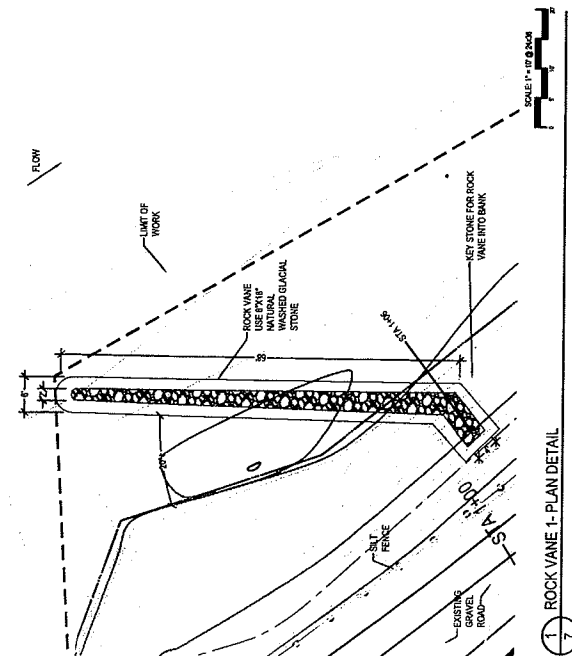
SHEET NUMBER  
 7



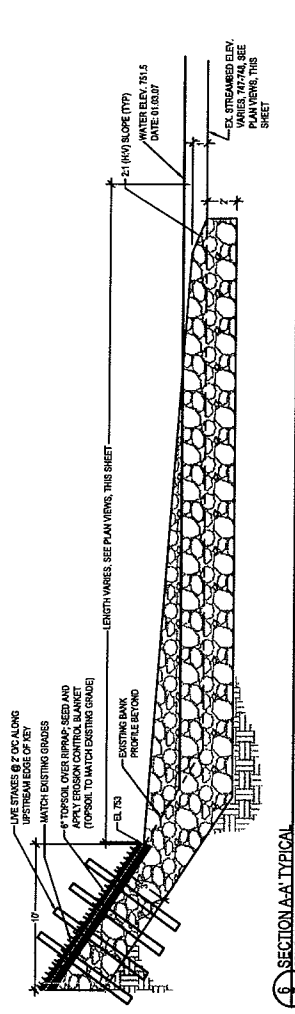
3 ROCK VANE 3- PLAN DETAIL



2 ROCK VANE 2- PLAN DETAIL



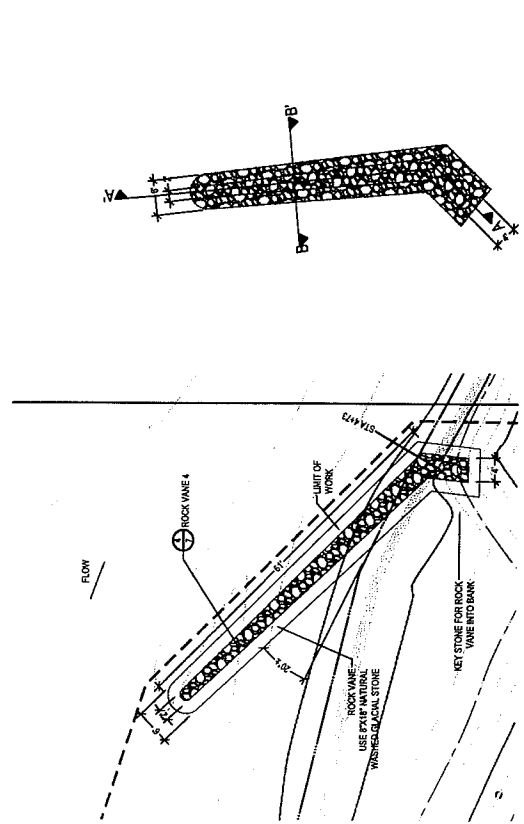
1 ROCK VANE 1- PLAN DETAIL



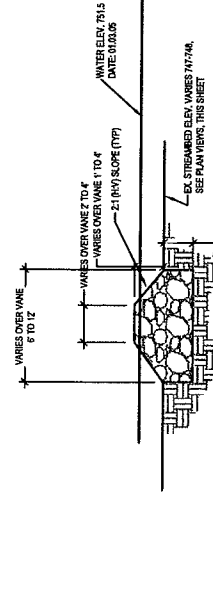
6 SECTION A-A TYPICAL

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4 ROCK VANE 4- PLAN DETAIL



7 SECTION B-B TYPICAL

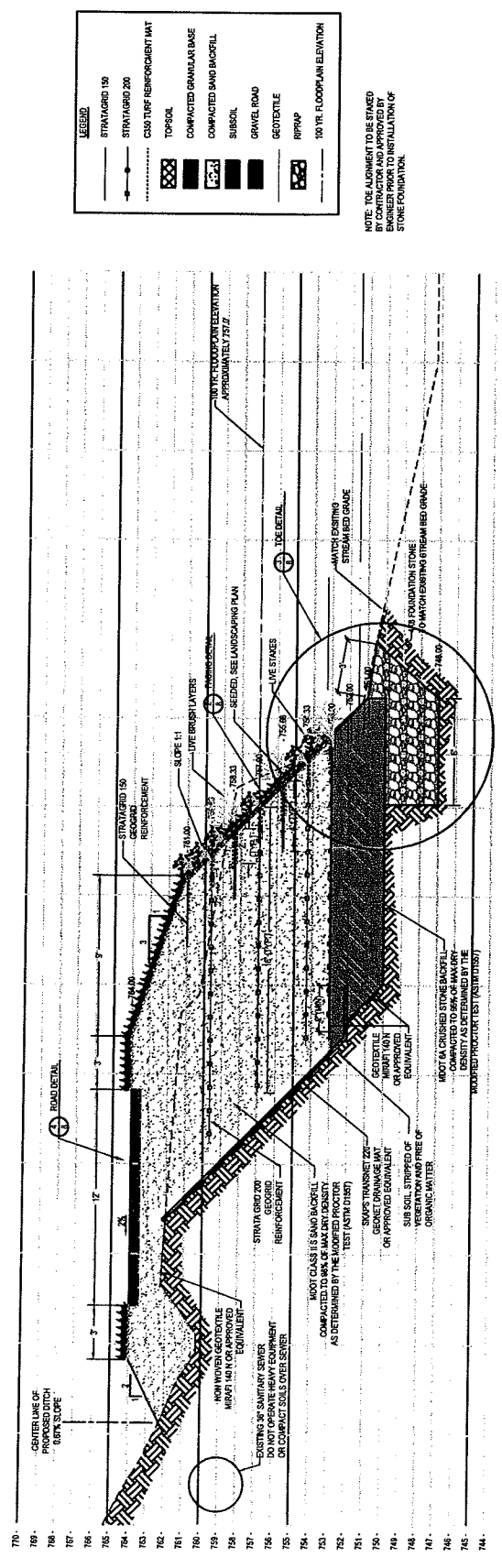
5 ROCK VANE DETAIL TYP.



DATE	DESCRIPTION

**CROSS SECTIONS  
 AND DETAILS**

**3** **BEFORE YOU DIG**  
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 1-800-485-7171

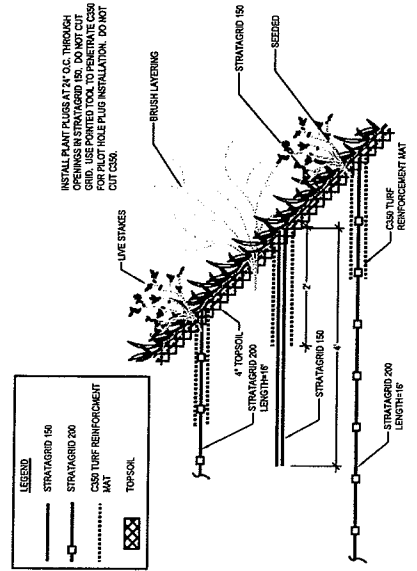


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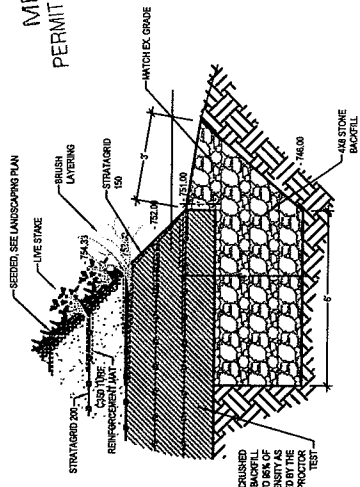
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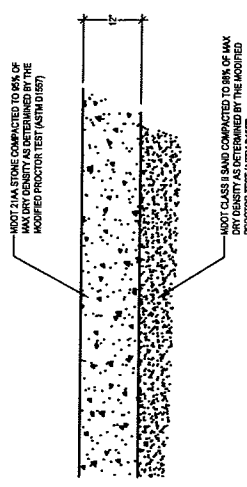
**1** SECTION X-X': PROPOSED PERMANENT STABILIZATION CROSS SECTION  
 SCALE: 1"=2' @ 24'X36"



**2** FACING DETAIL  
 SCALE: 1"=1' @ 24'X36"



**3** TOE DETAIL  
 SCALE: 1"=2' @ 24'X36"



**4** ROAD DETAIL  
 SCALE: 1"=1' @ 24'X36"

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 501 AVIS DRIVE, STE 5C  
 ANN ARBOR, MI 48106  
 TEL: 734-769-3100  
 FAX: 734-769-3104  
 www.ectinc.com

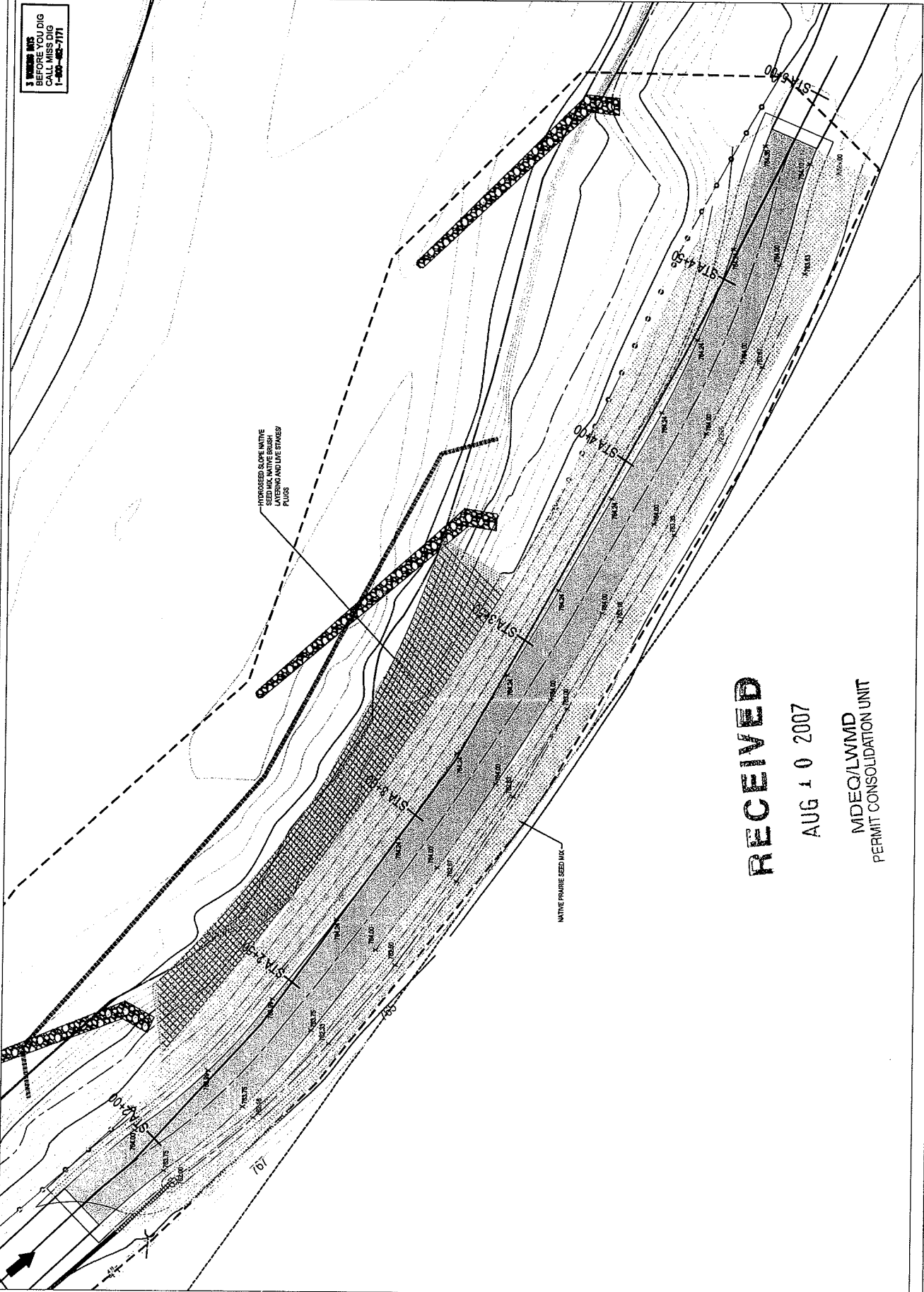
**LAND IMPROVEMENTS  
 NICHOLS ARBORETUM  
 ACCESS ROAD  
 STREAMBANK STABILIZATION  
 THE UNIVERSITY OF MICHIGAN  
 ANN ARBOR, MICHIGAN**

UM PROJECT NO. P00007115  
 BLDG. NO. 5985

DATE	
REVISION	
PROJECT NUMBER	
DESIGNED BY	
CHECKED BY	
DATE	
DRAWN BY	
DATE	
SCALE	
SHEET NAME	

**LANDSCAPING PLAN**

SCALE: 1" = 10' (AS SHOWN)  
  
 SHEET NUMBER **9**



3 YEARS IN  
 ONE YOU'VE  
 CALLED US  
 1-800-452-7171

HYDROSEED SLOPE WITH  
 SEED MIX, NATIVE BRUSH  
 LAYERS AND LIVE STAKES  
 PILES

NATIVE PRAIRIE SEED MIX

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 ARBORETUM**  
**ACCESS ROAD  
 STREAMBANK  
 STABILIZATION**  
 THE UNIVERSITY OF  
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UM PROJECT NO. P0000715  
 BLOC. NO. 0665

**REVISIONS**

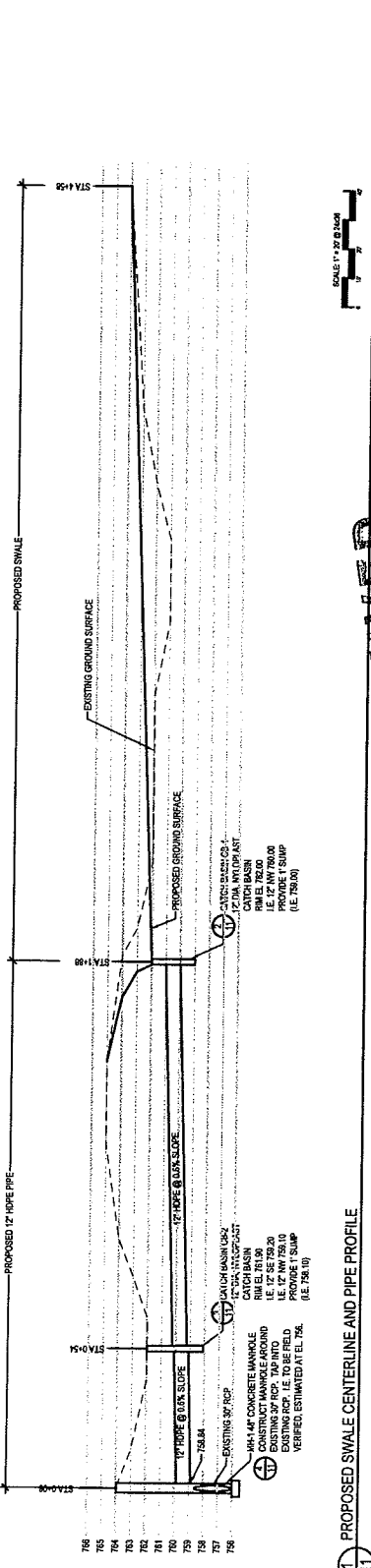
NO.	DATE	DESCRIPTION

SHEET NAME  
**DRAINAGE  
 DETAILS**

SCALE 1" = 8' & 3" ON

SHEET NUMBER  
**10**

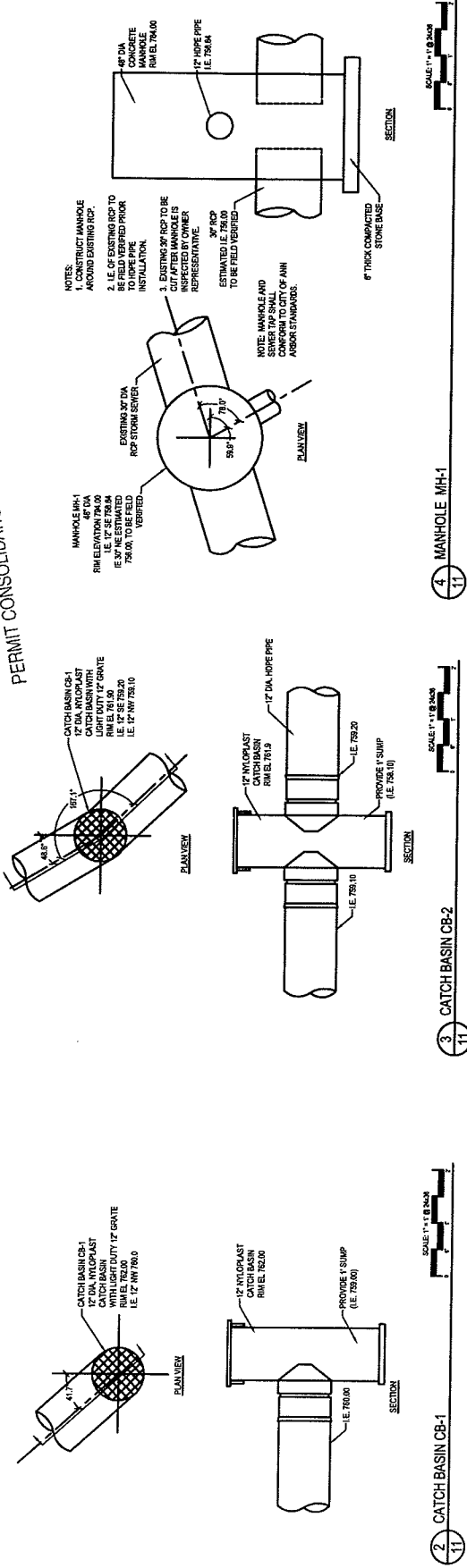
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**1 PROPOSED SWALE CENTERLINE AND PIPE PROFILE**



**2 CATCH BASIN CB-1**

**3 CATCH BASIN CB-2**

**4 MANHOLE MH-1**

