

CONTRACT DOCUMENTS
FOR THE
ARGO DAM TOE DRAIN IMPROVEMENTS



August, 2010

FILE NO. 11001
BID NO. ITB-4119

PUBLIC SERVICES DEPARTMENT

CITY OF ANN ARBOR
100 North Fifth Avenue
Ann Arbor, Michigan 48104

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ADVERTISEMENT FOR
ARGO DAM TOE DRAIN IMPROVEMENTS
FOR THE
CITY OF ANN ARBOR, MICHIGAN

BID NO. ITB-4119

Sealed Bids will be received by the, Ann Arbor Procurement Office, Fifth Floor, City Hall, on or before Wednesday, September 15, 2010 at 2:00 PM for construction of Argo Dam Toe Drain Improvements. Bids will be publically opened and read aloud at this time.

Work to be done at Argo Dam includes the clearing vegetation along the 1,350 LF drainage ditch at the base of the Argo Dam headrace; grade the drainage ditch to expose 55 toe drains; place spoils along the edge of the ditch; repair and extend the toe drains with schedule 80 PVC pipe; route the drains clean from dirt, debris, and roots; place riprap and geotextile fabric at drain outlets; stabilize and seed disturbed areas; and all related work.

Bids may be downloaded from the following websites:

<http://www.a2gov.org/government/financeadminservices/procurement/Pages/OpenBidsandProposals.aspx>. or www.govbids.com

Each proposal shall be accompanied by a certified check, or Bid Bond by a recognized surety, in the amount of 5% of the total of the bid price. A proposal, once submitted, becomes the property of the City. In the sole discretion of the City, the City reserves the right to allow a bidder to reclaim submitted documents provided the documents are requested and retrieved no later than 48 hours prior to the scheduled bid opening.

The successful Bidder will be required to furnish satisfactory performance and labor and material bonds in the amount of 100% of the bid price and satisfactory insurance coverage.

Precondition for entering into a contract with the City of Ann Arbor: (i) compliance with Chapter 112 of Title IX of the Code of the City of Ann Arbor. (ii) compliance with applicable prevailing wage and CUB Agreement and living wage requirements of Chapter 23 of Title I of the Code of the City of Ann Arbor. Further information is outlined in the contract documents.

After the time of opening, no Bid may be withdrawn for a period of 120 days. The City reserves the right to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

Any further information may be obtained from the Ann Arbor Procurement Office, (734) 794-6500 ext. 4-5206.

CITY OF ANN ARBOR, MICHIGAN

City of Ann Arbor Procurement Office

INSTRUCTIONS FOR CONTRACTORS

For Completing CONTRACT COMPLIANCE FORM

City Policy

The “non discrimination in contracts” provision of the City Code, (Chapter 112, Section 9:161) requires contractors/vendors/grantees doing business with the City not to discriminate on the basis of actual or perceived race, color, religion, national origin, sex, age, condition of pregnancy, marital status, physical or mental limitations, source of income, family responsibilities, educational association, sexual orientation, gender identity or HIV status against any of their employees, any City employee working with them, or any applicant for employment. It also requires that the contractors/vendors/grantees include a similar provision in all subcontracts that they execute for City work or programs.

This Ordinance further requires that each prospective contractor/vendor submit employment data to the City showing current total employee breakdown by occupation, race and gender. This allows the Human Rights Office to determine whether or not the contractor/vendor has a workforce that is reflective of the availability of women and under-represented minorities within the contractor’s labor recruitment area (the area where they can reasonably be expected to recruit employees). ***This data is provided to the City on the Human Rights Contract Compliance Forms (attached).***

To complete the form:

1) If a company has more than one location, then that company must complete 2 versions of the form.

- **Form #1** should contain the employment data for the **entire corporation.**
- **Form #2** should contain the employment data for those employees:
 - who will be working on-site;
 - in the office responsible for completing the contract; or,
 - in the case of non-profit grantees, those employees working on the project funded by the City grant(s).

2) If the company has only one location, fill out Form #1 only.

3) Complete all data in the upper section of the form including the name of the person who completes the form and the name of the company/organization’s president.

4) Complete the Employment Data in the remainder of the form. Please be sure to complete all columns including the Total Columns on the far right side of the form, and the Total row and Previous Year Total row at the bottom of the form.

5) Return the completed form(s) to your contact in the City Department for whom you will be conducting the work.

For assistance in completing the form, contact:

Procurement Office of the City of Ann Arbor
734/994-2719

If a contractor is determined to be out of compliance, the Procurement Office will work with them to assist them in coming into compliance.

**CITY OF ANN ARBOR PROCUREMENT OFFICE
HUMAN RIGHTS CONTRACT COMPLIANCE FORM**
Entire Organization (Totals for All Locations where applicable)

Form #1

Name of Company/Organization _____ Date Form Completed _____
 Name and Title of Person Completing this Form _____ Name of President _____
 Address _____ (Street address) _____ (City) _____ (State) _____ County _____ Phone # _____ (Area Code) _____
 Fax# _____ (Area Code) _____ Email Address _____

EMPLOYMENT DATA

Job Categories	Number of Employees (Report employees in only one category)												
	Male						Female						TOTAL COLUMNS A-M
	A	B	C	D	F	G	H	I	J	K	L	M	
Exec./Sr. Level Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

**CITY OF ANN ARBOR PROCUREMENT OFFICE
HUMAN RIGHTS CONTRACT COMPLIANCE FORM**
Local Office (Only those employees that will do local or on-site work, if applicable)

Name of Company/Organization _____ Date Form Completed _____

Name and Title of Person Completing this Form _____

Fax# _____ (Area Code) _____ Email Address _____

EMPLOYMENT DATA

**Number of Employees
(Report employees in only one category)**

Job Categories	Male							Female					TOTAL COLUMNS A-M
	A	B	C	D	F	G	H	I	J	K	L	M	
	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaska Native	White	Black or African American	Asian	Hispanic or Latino	Native Hawaiian or Other Pacific Islander	American Indian or Alaskan Native	
Exec./Sr. Officials													
Supervisors													
Professionals													
Technicians													
Sales													
Admin. Support													
Craftspeople													
Operatives													
Service Workers													
Laborers/Helper													
Apprentices													
Other													
TOTAL													
PREVIOUS YEAR TOTAL													

→ RATE EFFECTIVE APRIL 30, 2010-ENDING APRIL 29, 2011←

LIVING WAGE ORDINANCE – CITY OF ANN ARBOR

\$11.71 per hour

if the employer provides health care benefits*

\$13.06 per hour

if the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than \$10,000 in a twelve-month period of time ***must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.***

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than \$500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

** Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed \$.50 an hour for an average work week; and the employer cost or contribution must equal no less than \$1/hr for the average work week.*

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

For Additional Information or to File a Complaint Contact:

**Dee Lumpkin, Procurement Assistant
734/794-6576 or dlumpkin@a2gov.org**

City of Ann Arbor

**LIVING WAGE ORDINANCE
DECLARATION OF COMPLIANCE**

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that employers providing services to the City or recipients of grants for financial assistance (in amounts greater than \$10,000 in a twelve-month period of time) pay their employees who are working on the City project or grant, a minimum level of compensation known as the **Living Wage**. This wage must be paid to the employees for the length of the contract/project.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from the Ordinance. If this exemption applies to your firm, please check below:

- This company is exempt due to the fact that we employ or contract with fewer than 5 individuals.
- This **non-profit agency** is exempt due to the fact that we employ or contract with fewer than 10 employees.

The Ordinance requires that all contractors/vendors and/or grantees agree to the following terms:

- a) To pay each of its employees performing work on any covered contract or grant with the City, no less than the living wage, which is defined as \$11.71/hour when health care is provided, or no less than \$13.06/hour for those employers that do *not* provide health care. It is understood that the Living Wage will be adjusted each year on April 30, and covered employers will be required to pay the adjusted amount thereafter. The rates stated above include any adjustment for 2010.
- b) Please check the boxes below which apply to your workforce:
 - Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage without health benefits Yes_____ No_____
 - OR**
 - Employees who are assigned to *any covered* City project or grant will be paid at or above the applicable living wage with health benefits Yes_____ No_____
- c) To post a notice approved by the City regarding the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- d) To provide the City payroll records or other documentation as requested; and,
- e) To permit access to work sites to City representatives for the purposes of monitoring compliance, investigating complaints or non-compliance.

The undersigned authorized representative hereby obligates the contractor/vendor or grantee to the above stated conditions under penalty of perjury and violation of the Ordinance.

Company Name

Address City State Zip

Signature of Authorized Representative

Phone (area code)

Type or Print Name and Title

Email address

Date signed

Questions about this form? Please contact:
Procurement Office City of Ann Arbor
Phone: 734/794-6576 Fax:734/994-1795

- Effective February 1, 2010-

**CITY OF ANN ARBOR RESOLUTION R-09-459
CUB AGREEMENT REQUIREMENT**

**NOTICE TO ALL CONTRACTORS AND SUBCONTRACTORS
PERFORMING CONSTRUCTION WORK FOR THE CITY OF ANN
ARBOR ON ANY CITY CONSTRUCTION PROJECT**

Any labor used on a City construction project bid and awarded by the City of Ann Arbor must be governed by the current collective bargaining agreement of the appropriate Local Unions of the Washtenaw County Skilled Building Trades Council (SBTC).

All invitations to bid on construction contracts include, as a condition of award, the requirement that all contractors and subcontractors execute a CUB agreement with the SBTC. Each contractor and subcontractor at all tiers of a project shall, prior to beginning work on the project, become signatory parties to the respective current collective bargaining agreements of the appropriate Local Unions of the SBTC. Alternately, when no other agreement exists, a Contractor may sign a one-time project agreement for the CUB project, covering that construction project only.

All potential bidders and contractors must contact the current CUB representative, Bart Nickerson at 734-944-5317 (office) or 734-320-2227 (cell) for a complete summary of the procedures and requirements pursuant to the CUB Memorandum of Understanding

**CONTRACTORS SHALL DISPLAY THIS NOTICE WHERE EMPLOYEES CAN
READILY SEE IT.**

Questions Contact

D. Lumpkin, Procurement Assistant
dlumpkin@a2gov.org

MEMORANDUM OF UNDERSTANDING

1. WORK DISPUTES

In return for the promise made in paragraph (3) below, the parties agree that there will be no strike, work stoppage or lock-out for the duration of this Memorandum. Any jurisdictional dispute shall be resolved through normal procedures.

There will be a job conference with all contractors and sub-contractors prior to starting work.

2. COFFEE BREAKS

There shall be no organized coffee breaks.

3. PAYMENT OF FRINGES

Any Union having a claim against a contractor or subcontractor for unpaid wages and/or fringe benefits for work performed on the project shall give written notice of such claim to such contractor or subcontractor (with a copy of the notice to the Construction Manager or General Contractor) within three (3) business days after such claim has become known. Upon receipt of such written notice, the Construction Manager or General Contractor involved shall withhold an amount equal to the claim from the next disbursement payable to the contractor, pending resolution of the dispute satisfactory to the Construction Manager or General Contractor. In the event of any such dispute, the Union agrees to use its best efforts to pursue any legal remedies available, including litigation by Fund Trustees. It is understood that the intent to this section is to accomplish prompt and effective resolution of any disputes between the Union and any contractor or subcontractor over payment of wages and fringes.

4. UNION WORK

The parties understand and agree that each contractor and subcontractor at all tiers of this project shall, prior to beginning work on the project, become signatory parties to the respective current collective bargaining agreements of the appropriate Local Unions of the Washtenaw County Skilled Building Trades Council.

(Contractor, Owner or Construction Manager)	(Representative of Washtenaw County Skilled Building Trades Council)
(Project Description)	(Date)

THIS MEMORANDUM APPLIES ONLY TO THE PROJECT AND/OR CONSTRUCTION ABOVE DESCRIBED.

- WHITE — Union Copy**
- GREEN — Contractor or Construction Manager Copy**
- CANARY - Owner Copy**
- PINK — CUB Copy**
- GOLD — Project Copy**

Printed On Site

CUB BUILDING TRADES AFFILIATES

Below is a list of trades that fall under the CUB agreement requirement. Any type of work not listed below is not required to be signatory to the CUB agreement or a one-time Project Agreement with a Union. If, as a prospective bidder, you are unsure if a type of work is exempt, please contact **Bart Nickerson** at **734-944-5317 (office)** or **734-320-2227 (cell)**.

BRICKLAYERS LOCAL 9

CEMENT MASONS LOCAL 514

ELECTRICIANS LOCAL 252

ELEVATOR CONSTRUCTORS LOCAL 85

GLAZIERS LOCAL 357

HEAT & FROST WORKERS LOCAL 25

IRON WORKERS LOCAL 25

LABORERS LOCAL 499

OPERATING ENGINEERS LOCAL 324

PAINTERS LOCAL 687

PLASTERERS LOCAL 67

PLUMBERS & PIPEFITTERS LOCAL 190

ROOFERS LOCAL 70

SHEET METAL LOCAL 80

SPRINKLERS FITTERS LOCAL 704

TEAMSTERS LOCAL 247

TILE MARBLE LOCAL 1

NOTICE OF PRE-BID CONFERENCE

A pre-bid conference for this project will be held on Monday, August 30, 2010 at 9:00 a.m. beginning in the parking lot of the Argo Canoe Livery located at 1055 Longshore Drive, Ann Arbor, MI 48105. Refer also to the plans and cover sheet for a project location map. The pre-bid conference and site visit is provided to allow the potential bidders the opportunity to view the project site, existing conditions, site constraints, accessibility, etc.

Attendance at this conference is highly recommended. Administrative and technical questions regarding this project will be answered at this time. If any questions arise whose answers constitute modifications to the bid documents, an addendum will be issued.

INSTRUCTIONS TO BIDDERS

General

Work to be done under this Contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents. All work to be done under this Contract is located in or near the City of Ann Arbor.

The City shall make available to all prospective Bidders, prior to receipt of the Bids, access to the area in which the work is to be performed. Advance notice should be given to the Administering Service Area/Unit in cases where access to the site must be arranged by the City.

Any proposal which does not conform fully with these instructions may be rejected.

Proposals

Proposals must be submitted on the "Proposal Forms" and "Bid Forms" provided, without removal from the binder, with each blank properly filled in. Sealed proposals will be received by the City of Ann Arbor Purchasing Division, Fifth Floor, City Hall, Ann Arbor, Michigan, at the time stipulated in the Advertisement, promptly after which proposals will be publicly opened and read aloud. Each proposal must be enclosed in a sealed envelope, endorsed across one end:

BID #ITB-4119, Proposal for Argo Dam Toe Drain Improvements

The City will evaluate Proposals based on cost as well as experience. Contractors that have not included the required list of similar work experience and associated references in Section 5 of the bid Form may have their bid rejected.

The City intends to award a Contract(s) to the lowest responsible Bidder(s). On multi-divisional contracts, separate divisions may be awarded to separate Bidders. The City may also utilize discounts offered in the Bid Forms, if any, to determine the lowest responsible Bidder on each division, and award multiple divisions to a single Bidder, so that the lowest total cost is achieved for the City. For unit price bids, the contract will be awarded based upon the lump sum and unit prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the City. If the City determines that the unit price for any item is materially different for the work item bid than either other bidders or the general market, the City, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

The acceptability of major subcontractors will be considered in determining if a Bidder is responsible. In comparing proposals, the City will give consideration to alternate proposals for items listed in the forms, or other alternates which the Bidder may wish to submit, but preference will be given to Base Bid Proposals.

Bidders should be aware that despite the issuance of this advertisement, the City may not pursue the Argo Dam Toe Drain Improvements. The City is evaluating two options that will meet the requirements of the MDNRE: repair of the toe drains only and repair of the toe drains coupled with headrace reconstruction that will enhance recreational amenities and remove the canoe portage. A Request for Proposals for the headrace reconstruction project has been released. City Council will

evaluate the proposals for reconstructing the headrace and the bids for toe drain repairs and make a decision in early December on which option the City will pursue. Submitting a bid for this project does not exclude you from submitting a proposal on the headrace reconstruction project. Any cost incurred for preparation of the bids or proposals will be at the expense of the bidder.

The City reserves the right to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

Bid Security

Each proposal must be accompanied by a certified check, or Bid Bond by a surety licensed and authorized to do business within the State of Michigan, in the amount of 5% of the total of the bid price.

Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of days specified in the Advertisement.

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated on page C-1, Article III of the Contract. If these time requirements can not be met, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given on page C-2, Article III of the Contract, provides that the Contractor shall pay the City as liquidated damages, and not as a penalty, a sum certain per day for each and every day that the Contractor may be in default of completion of the specified work, within the time(s) stated in the Contract, or written extensions.

Liquidated damages clauses, as given in the General Conditions, provide further that the City shall be entitled to impose and recover liquidated damages for breach of the obligations under Chapter 112 of the City Code.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Human Rights Information

Section 5, beginning at page GC-3, outlines the requirements for fair employment practices under City of Ann Arbor Contracts. To establish compliance with this Ordinance, the Bidder must complete and return with its bid completed copies of the white and pink Human Rights Division Contract Compliance Forms (copy attached) or an acceptable equivalent.

Wage Requirements

Section 4, beginning at page GC-1, outlines the requirements for payment of prevailing wages or of a “living wage” to employees providing service to the City under this contract. In addition Section 4 outlines the requirement for execution of a CUB Agreement with the Washtenaw County Skilled Building Trades Council (SBTC). The successful bidder must comply with all applicable requirements and provide documentary proof of compliance when requested.

Major Subcontractors

The Bidder shall identify each major subcontractor it expects to engage for this Contract if the work to be subcontracted is 15% or more of the bid sum or over \$50,000, whichever is less. The Bidder also shall identify the work to be subcontracted to each major subcontractor.

PROPOSAL

City of Ann Arbor
Guy C. Larcom Municipal Building
Ann Arbor, Michigan 48107

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including Advertisement, Human Rights Division Contract Compliance Forms, CUB Agreement, Notice of Pre-Bid Conference, Instructions to Bidders, Proposal, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans and understands them. The Bidder declares that it conducted a full investigation at the site and of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance. The Bidder also declares that it has extensive experience in successfully completing projects similar to this one.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the City of Ann Arbor, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

The undersigned proposes to perform all work shown on the plans or described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, and other means of construction to do all the work, furnish all the materials, and complete the work in strict accordance with all terms of the Contract of which this proposal is one part.

In accordance with these bid documents, and Addenda numbered _____, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

The Bidder declares that it has become fully familiar with the provisions of Ann Arbor City Council Resolution R-09-459, and that it understands and agrees that any labor used on this Bid to be awarded by the City shall be governed by the current collective bargaining agreement of the appropriate Local Unions of the Washtenaw County Skilled Building Trades Council (SBTC). The Bidder further acknowledges and agrees that if awarded the bid Bidder, and any and all subcontractors employed by it in performance of contract shall as a condition of award be required to execute a CUB Agreement with SBTC. Bidder further agrees that the cited City Council Resolution forms a part of this Contract.

The Bidder declares that it has become fully familiar with the liquidated damage clauses for completion times and for compliance with City Code Chapter 112, understands and agrees that the liquidated damages are for the non-quantifiable aspects of non-compliance and do not cover actual

damages that may be shown and agrees that if awarded the Contract, all liquidated damage clauses form part of the Contract.

The Bidder declares that it has become fully familiar with the provisions of Chapter 14, Section 1:319 (Prevailing wages) and Chapter 23 (Living Wage) of the Code of the City of Ann Arbor and that it understands and agrees to comply, to the extent applicable to employees providing services to the City under this Contract, with the wage and reporting requirements stated in the City Code provisions cited. Bidder further agrees that the cited provisions of Chapter 14 and Chapter 23 form a part of this Contract.

The Bidder encloses a certified check or Bid Bond in the amount of 5% of the total of the Bid Price. The Bidder agrees both to contract for the work and to furnish the necessary Bonds and insurance documentation within 10 days after being notified of the acceptance of the Bid.

If this Bid is accepted by the City and the Bidder fails to contract and furnish the required Bonds and insurance documentation within 10 days after being notified of the acceptance of this Bid, then the Bidder shall be considered to have abandoned the Contract and the certified check or Bid Bond accompanying this Proposal shall become due and payable to the City.

If the Bidder enters into the Contract in accordance with this Proposal, or if this Proposal is rejected, then the accompanying check or Bid Bond shall be returned to the Bidder.

In submitting this Bid, it is understood that the right is reserved by the City to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

SIGNED THIS _____ DAY OF _____, 201__.

Bidder's Name

Official Address

Telephone Number

Authorized Signature of Bidder

(Print Name of Signer Above)

LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form and strike out the other two.)

Bidder declares that it is:

* A corporation organized and doing business under the laws of the state of _____, for whom _____, bearing the office title of _____, whose signature is affixed to this proposal, is authorized to execute contracts.

* A partnership, list all members and the street and mailing address of each:

Also identify the County and State where partnership papers are filed:

County of _____, State of _____

* An individual, whose signature with address, is affixed to this proposal: _____
(initial here)

BID FORM

Section 1 – Schedule of Prices

Project: Argo Dam Toe Drain Improvements

File No.: 11001

Bid No.: ITB-4119

NOTES:

1. All bidders shall provide a Unit Price and Total Price for all bid items identified (including Alternate items).
2. Quantities included in bid table represent estimated quantities for different work. Contractor shall be compensated for the actual quantities using the unit prices provided.
3. Any item not provided in the following list shall be considered incidental.
4. The City, at their sole discretion, may elect to delete any portion of the work delineated below with no change to the unit prices provided.

Item	Description	Unit	Quantity	Unit Price	Total Price
1	Drainage Ditch Improvements - Including mobilization, protection of bridges, signage, safety fencing, tree protection, soil erosion control measures including silt fencing, dewatering and control of on-site water, temporary dams, erosion control matting, access road, clearing, grubbing, stump removal, vegetation disposal, dewatering, grading and placement of spoils, rip rap, geotextile fabric, seeding, restoration, demobilization and all other items required to complete the Work.	LS	1	\$	\$
2	Toe Drain Repair within the Drainage Ditch - Including locate, excavate, repair VCP drain with 4-inch diameter Schedule 80 PVC pipe (assume 10-foot length each drain), coupling (if required), identification post, bedding material, riprap, geotextile fabric, routing drain clean and all other items required to complete the Work.	EA	47	\$	\$
3	Toe Drain Repair along the River's Edge - Including locate, excavate, repair VCP drain with 4-inch diameter Schedule 80 PVC pipe (assume 10-foot length each drain), coupling (if required), identification post, bedding material, riprap, geotextile fabric, Aquadam or similar barrier, dewatering, routing drain clean and all other items to complete the Work.	EA	8	\$	\$

Item	Description	Unit	Quantity	Unit Price	Total Price
4	Additional repair to damaged VCP drain tile - Including additional excavation, perforated pipe with geotextile sock (assume 15-foot length of additional pipe for each drain), additional bedding material, additional backfilling and all other additional items required to complete the Work.	EA	30	\$	\$
5	Embankment Improvements – Includes improvements to the embankment outside of the clearing, grubbing and seeding for the drainage ditch improvements. Only applies to the embankment to the north of the toe drains including the entire embankment where the toe drains discharge to the river. Including clearing and grubbing of all brush, removal of stumps, vegetation disposal, surface grading, tilling 4-inches of existing topsoil, seeding entire embankment, erosion control mats, and all related work.	LS	1	\$	\$
6	Rock Gabion & Field Stone Shore Stabilization – Including excavation, placement of bedding material, placement of filter fabric, construction and placement of the rock-filled gabions, field stone rip rap installation, backfill, compaction, placement of gravel on the pathway, restoration and all other additional items required to complete the Work.	LF	210	\$	\$
7	Allowance – Allowance for permits per specification Section 01210.	LS	1	\$ 4,000.00	\$ 4,000.00
TOTAL BASE BID					\$

Alternate Bid Items					
Item	Description	Unit	Quantity	Unit Price	Total Price
A	River Opening Riprap – Provisional work for the installation of heavy riprap at each of the river openings including placement, geotextile fabric, and all related work.	CYD	300	\$	\$
B	Topsoil – In lieu of tilling the top 4-inches of the embankment, includes the placement of 3-inches of clean topsoil from outside source over the embankment.	CYD	600	\$	\$
TOTAL ALTERNATE BID					\$

BF-2

BID FORM

BID FORM

Section 2 - Material and Equipment Alternates

The Base Bid proposal price shall include materials and equipment selected from the designated items and manufacturers listed in the bidding documents. This is done to establish uniformity in bidding and to establish standards of quality for the items named.

If the Contractor wishes to quote alternate items for consideration by the City, it may do so under this Section. A complete description of the item and the proposed price differential must be provided. Unless approved at the time of award, substitutions where items are specifically named will be considered only as a negotiated change in Contract Sum.

<u>Item Number</u>	<u>Description</u>	<u>Add/Deduct Amount</u>
--------------------	--------------------	--------------------------

If the Bidder does not suggest any material or equipment alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any material or equipment alternate under the contract.

Signature of Authorized Representative of Bidder _____

BF-3

BID FORM

Section 3 - Time Alternate

If the Bidder takes exception to the time stipulated in Article III of the Contract, Time of Completion, page C-1, it is requested to stipulate below its proposed time for performance of the work. Consideration will be given to time in evaluating bids.

If the Bidder does not suggest any time alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any time alternate under the contract.

Signature of Authorized Representative of Bidder _____

BID FORM

Section 4 - Subcontractors

For purposes of this contract, a Subcontractor is anyone (other than the Contractor) who performs work (other than or in addition to the furnishing of materials, plans or equipment) at or about the construction site, directly or indirectly for or on behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any individual who furnishes merely the individual's own personal labor or services.

For the work outlined in these documents the Bidder expects to engage the following subcontractors to perform the work identified and warrants that any subcontractor identified shall as a condition of employment execute a CUB Agreement with the Washtenaw County Skilled Building Trades Council:

<u>Subcontractor (Name and Address)</u>	<u>Work</u>	<u>Amount</u>
	Earthwork	
	Landscaping	
	Other	

If the Bidder does not expect to engage any major subcontractor, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT expect to engage any major subcontractor to perform work under the contract.

Signature of Authorized Representative of Bidder _____

BID FORM

Section 5 – References

Include a minimum of three references from previously completed, similar work, within the past five years.

1) _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

2) _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

3) _____
Project Name Cost Date Constructed

_____ _____
Contact Name Phone Number

CONTRACT

THIS AGREEMENT is made on the _____ day of _____, 2010, between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 100 N. Fifth Avenue, Ann Arbor, Michigan 48104 (City) and _____ (Contractor)

(An individual/partnership/corporation, include state of incorporation)

(Address)

Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled "Argo Dam Toe Drain Improvements" in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

Human Rights Division Contract	General Conditions
Compliance Forms	Standard Specifications
Living Wage Declaration of	Detailed Specifications
Compliance Forms	Plans
(if applicable)	Addenda
CUB Agreement (if applicable)	
Bid Forms	
Proposal	
Contract and Exhibits	
Bonds	

ARTICLE II - Definitions

Administering Service Area/Unit means Public Services Area.

Supervising Professional means Senior Engineer or other persons acting under the authorization of the Administrator of the Public Services Area.

Project means Argo Dam Toe Drain Improvements Bid No. ITB-4119

ARTICLE III - Time of Completion

- (A) The work to be completed under this Contract shall begin immediately after the Contractor's receipt of a fully executed Contract.
- (B) The entire work for this Contract shall be completed within 5 consecutive calendar months. Shorter completion times for certain portions of the work are specified in the Detailed Specifications.

- (C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to \$300.00 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

As an independent requirement, where the Detailed Specifications identify certain portions of the work to be completed within a shorter period of time and the Contractor fails to complete each portion within the shorter period specified for each portion, including any extension granted in writing by the Project Supervisor, the City is entitled to deduct from the monies due the Contractor, as liquidated damages and not as a penalty, the amount identified in the Detailed Specifications for each portion of the work not timely completed for each calendar day of delay in completion of each portion of the work.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Liquidated damages under this section are in addition to any liquidated damages due under Section 5 of the General Conditions.

ARTICLE IV - The Contract Sum

- (A).....The City shall pay to the Contractor for the performance of the Contract, the unit prices as given in the Bid Forms for the estimated **base bid** total of:

_____ Dollars (\$_____)

- (B).....The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the contract documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract may not be assigned or subcontracted without the written consent of the City.

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this agreement, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract.

Whenever possible, each provision of the contract will be interpreted in a manner as to be effective and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a contract of employment but is a contract to accomplish a specific result. Contractor is an independent Contractor performing services for the City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this agreement.

ARTICLE VIII - Notice

All notices given under this contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the contract documents or other address the Contractor may specify in writing.

ARTICLE IX - Indemnification

To the fullest extent permitted by law, for any loss not covered by insurance under this contract, Contractor shall indemnify, defend and hold harmless the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this contract, by the Contractor or anyone acting on the Contractor's behalf under this contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations or agreements whether written or oral. Neither party has relied on any prior representations in entering into this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

FOR CONTRACTOR

By _____

Its: _____

FOR THE CITY OF ANN ARBOR

By _____
John Hieftje, Mayor

By _____
Jacqueline Beaudry, City Clerk

Approved as to substance

By _____
Roger W. Fraser, City Administrator

By _____
Sue F. McCormick, Public Service Area
Administrator

Approved as to form and content

Stephen K. Postema, City Attorney

PERFORMANCE BOND

- (1) _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for \$_____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written contract with the City dated _____ 2010 for: _____ and this bond is given for that contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.
- (3) Whenever the Principal is declared by the City to be in default under the contract, the Surety may promptly remedy the default or shall promptly:
- (a) complete the contract in accordance with its terms and conditions; or
 - (b) obtain a bid or bids for submission to the City for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.
- (4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the contract.
- (5) Surety agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work, or to the specifications.

SIGNED AND SEALED this _____ day of _____, 201 ____.

(Name of Surety Company)
By _____
(Signature)
Its _____
(Title of Office)

(Name of Principal)
By _____
(Signature)
Its _____
(Title of Office)

Approved as to form:

Name and address of agent:

Stephen K. Postema, City Attorney

LABOR AND MATERIAL BOND

- (1) _____
of _____, (referred to as "Principal"), and, _____
_____ a corporation duly authorized to do business in the
State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as
"City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as
amended, being MCL 129.201 et seq., in the amount of \$ _____, for the payment of
which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns,
jointly and severally, by this bond.
- (2) The Principal has entered a written contract with the City, dated _____, 201____,
for _____; and this bond is given for that contract in
compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;
- (3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under
the contract, the Surety shall pay those claimants.
- (4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation
if the Principal promptly and fully pays the claimants.

SIGNED AND SEALED this _____ day of _____, 201____.

(Name of Surety Company)

By _____
(Signature)

Its _____
(Title of Office)

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Approved as to form:

Name and address of agent:

Stephen K. Postema, City Attorney

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the City and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Proposal.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the City upon discovery and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage and CUB Agreement Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any Contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section."

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

Further, to the extent that any employees of the Contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with Section 1:319 of Chapter 14 of Title I of the Code of the City of Ann Arbor, the Contractor agrees to conform to Chapter 23 of Title I of the Code of the City of Ann Arbor, as amended, which in part states:

1:814. Applicability.

- (1) This Chapter shall apply to any person that is a Contractor/vendor or grantee as defined in Section 1:813 that employs or contracts with five (5) or more individuals; provided, however, that this Chapter shall not apply to a non-profit Contractor/vendor or non-profit grantee unless it employs or contracts with ten (10) or more individuals.
- (2) This Chapter shall apply to any grant, contract, or subcontract or other form of financial assistance awarded to or entered into with a Contractor/vendor or grantee after the effective date of this Chapter and to the extension or renewal after the effective date of this Chapter of any grant, contract, or subcontract or other form of financial assistance with a Contractor/vendor or grantee.

1:815. Living Wages Required.

- (1) Every Contractor/vendor or grantee, as defined in Section 1:813, shall pay its covered employees a living wage as established in this Section.
 - (a) For a covered employer that provides employee health care to its employees, the living wage shall be \$9.42 an hour, or the adjusted amount hereafter established under Section 1:815(3).
 - (b) For a covered employer that does not provide health care to its employees, the living wage shall be \$10.91 a hour, or the adjusted amount hereafter established under Section 1:815(3).
- (2) In order to qualify to pay the living wage rate for covered employers providing employee health care under subsection 1:815(1)(a), a covered employer shall furnish

proof of said health care coverage and payment therefor to the City Administrator or his/her designee.

- (3) The amount of the living wage established in this Section shall be adjusted upward no later than April 30, 2002, and every year thereafter by a percentage equal to the percentage increase, if any, in the federal poverty guidelines as published by the United States Department of Health and Human Services for the years 2001 and 2002. Subsequent annual adjustments shall be based upon the percentage increase, if any, in the United States Department of Health and Human Services poverty guidelines when comparing the prior calendar year's poverty guidelines to the present calendar year's guidelines. The applicable percentage amount will be converted to an amount in cents by multiplying the existing wage under Section 1.815(1)(b) by said percentage, rounding upward to the next cent, and adding this amount of cents to the existing living wage levels established under Sections 1:815(1)(a) and 1:815(1)(b). Prior to April 1 of each calendar year, the City will notify any covered employer of this adjustment by posting a written notice in a prominent place in City Hall, and, in the case of a covered employer that has provided an address of record to the City, by a written letter to each such covered employer.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor's employees who perform work on this contract.

Ann Arbor City Council Resolution R09-459. CUB Agreement Required.

Contractor further agrees to execute for itself and to require as a condition of employment the execution by any and all subcontractors, a project labor agreement as provided by the Washtenaw County Skilled Building Trades Council Construction Unity Board ("CUB Agreement"). Failure to comply with this Article shall be deemed a material breach of the contract and grounds for termination.

Section 5 - Non-Discrimination

The Contractor agrees to comply with the nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code and to take affirmative action to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate any inequality based upon race, national origin or sex. The Contractor agrees to comply with the provisions of Section 9:161 of Chapter 112 of the Ann Arbor City Code and in particular the following excerpts:

9:161 NONDISCRIMINATION BY CITY CONTRACTORS

- (1) All Contractors proposing to do business with the City of Ann Arbor shall satisfy the nondiscrimination administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All Contractors shall receive approval from the Director prior to entering into a contract with the City, unless specifically exempted by administrative policy. All City Contractors shall take affirmative action to insure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon race, national origin or sex.

- (2) Each prospective Contractor shall submit to the City data showing current total employment by occupational category, sex and minority group. If, after verifying this data, the Director concludes that it indicates total minority and female employment commensurate with their availability within the Contractor's labor recruitment area, i.e., the area from which the Contractor can reasonably be expected to recruit, said Contractor shall be accepted by the Director as having fulfilled affirmative action requirements for a period of one year at which time the Director shall conduct another review. Other Contractors shall develop an affirmative action program in conjunction with the Director. Said program shall include specific goals and timetables for the hiring and promotion of minorities and females. Said goals shall reflect the availability of minorities and females within the Contractor's labor recruitment area. In the case of construction Contractors, the Director shall use for employment verification the labor recruitment area of the Ann Arbor-Ypsilanti standard metropolitan statistical area. Construction Contractors determined to be in compliance shall be accepted by the Director as having fulfilled affirmative action requirements for a period of six (6) months at which time the Director shall conduct another review.
- (3) In hiring for construction projects, Contractors shall make good faith efforts to employ local persons, so as to enhance the local economy.
- (4) All contracts shall include provisions through which the Contractor agrees, in addition to any other applicable Federal or State labor laws:
 - (a) To set goals, in conference with the Human Resources Director, for each job category or division of the work force used in the completion of the City work;
 - (b) To provide periodic reports concerning the progress the Contractor has made in meeting the affirmative action goals it has agreed to;
 - (c) To permit the Director access to all books, records and accounts pertaining to its employment practices for the purpose of determining compliance with the affirmative action requirements.
- (5) The Director shall monitor the compliance of each Contractor with the nondiscrimination provisions of each contract. The Director shall develop procedures and regulations consistent with the administrative policy adopted by the City Administrator for notice and enforcement of non-compliance. Such procedures and regulations shall include a provision for the posting of Contractors not in compliance.
- (6) All City contracts shall provide further that breach of the obligation not to discriminate shall be a material breach of the contract for which the City shall be entitled, at its option, to do any or all of the following:
 - (a) To cancel, terminate, or suspend the contract in whole or part and/or refuse to make any required periodic payments under the contract;
 - (b) Declare the Contractor ineligible for the award of any future contracts with the City for a specified length of time;

- (c) To recover liquidated damages of a specified sum, said sum to be that percentage of the labor expenditure for the time period involved which would have accrued to minority group members had the affirmative action not been breached;
- (d) Impose for each day of non-compliance, liquidated damages of a specified sum, based upon the following schedule:

<u>Contract Amount</u>	<u>Assessed Damages Per Day of Non-Compliance</u>
\$ 10,000 - 24,999	\$ 25.00
25,000 - 99,999	50.00
100,000 - 199,999	100.00
200,000 - 499,999	150.00
500,000 - 1,499,999	200.00
1,500,000 - 2,999,999	250.00
3,000,000 - 4,999,999	300.00
5,000,000 - and above	500.00

- (e) In addition the Contractor shall be liable for any costs or expenses incurred by the City of Ann Arbor in obtaining from other sources the work and services to be rendered or performed or the goods or properties to be furnished or delivered to the City under this contract.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to it's work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

- (1) When work under an extra work order is added to the work under this Contract;
- (2) When the work is suspended as provided in Section 20;
- (3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;
- (4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;
- (5) Delay due to an act of Government;
- (6) Delay by the Supervising Professional in the furnishing of plans and necessary information;
- (7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section 13. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

- (1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;
- (2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;
- (3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;
- (4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
- (5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 180 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other Contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within 10 days after written notice, the City may remove them and, if the removed material has value, may store the material at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a

manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

- (1) The consent of the surety to payment of the final estimate;
- (2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

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

- (1) unsettled liens;
- (2) faulty work appearing within 12 months after final payment;
- (3) hidden defects in meeting the requirements of the plans and specifications;
- (4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days.

The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

- (1) Defective work not remedied;
- (2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;
- (3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;
- (4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

- A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:
 1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - \$500,000 each accident
Bodily Injury by Disease - \$500,000 each employee
Bodily Injury by Disease - \$500,000 each policy limit

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

\$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.

\$5,000,000 Per Job General Aggregate

\$1,000,000 Personal and Advertising Injury

\$2,000,000 Products and Completed Operations Aggregate

3. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
4. Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.

- B. Insurance required under Section A.2 and A.3 of this Contract shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.
- C. In the case of all Contracts involving on-site work, the Contractor shall provide to the City before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Service Area/Unit at least ten days prior to the expiration date.

- D. Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

- (1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
- (2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 201__, to, _____ 201__, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled Argo Dam Toe Drain Improvements, for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

Contractor

Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below.

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor, _____, represents that on _____, 201____, it was awarded a contract by the City of Ann Arbor, Michigan to _____ under the terms and conditions of a Contract titled Argo Dam Toe Drain Improvements.

The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

Contractor

By _____
(Signature)

Its _____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 201____
_____, _____ County, Michigan

Notary Public

My commission expires on: _____

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Advertisement. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

A copy of the Public Services Department Standard Specifications may be purchased from the Engineering Division, (Fourth Floor, City Hall, Ann Arbor, Michigan), for \$35.00 per copy. In addition, a copy of these Standard Specifications is available for public viewing at the Engineering Division office, for review Monday through Friday between the hours of 8:30 a.m. and 4:00 p.m.

SECTION 01000

GENERAL REQUIREMENTS

1.00 GENERAL

1.01 DESCRIPTION OF WORK

- A. Work under this Contract consists of improvements to the Argo Dam toe drains.
- B. Work at Argo Dam consists of improvements to an approximately 1350-foot long drainage ditch at the base of the Argo headrace. The improvements include:
 - 1. Mobilization including site access and soil erosion control.
 - 2. Control on-site water as needed with temporary dams and dewatering.
 - 3. Clear vegetation along the entire length of the ditch and embankment (approximately 1350 feet long by 25 feet wide with 120 trees to be felled and stumps removed).
 - 4. Remove stumps along the embankment between the ditch and the head race (approximately 90 stumps to be removed).
 - 5. Regrade the entire ditch to expose the toe drain outlets and allow free discharge.
 - 6. Place spoils on site along the edges of the ditch. Spoils shall be graded and edges feathered to meet existing grades.
 - 7. Locate all vitrified clay pipe toe drains (approximately 55) and repair the ends with Schedule 80 PVC pipe.
 - 8. Route the drains clean from dirt, debris and roots.
 - 9. Televiser the full length of all drains.
 - 10. Permanently mark all drain outlets with an identification post.
 - 11. Place riprap and geotextile fabric at the drain outlets.
 - 12. Stabilize the new ditch with rip rap and all disturbed areas with seed and erosion control mats.
- C. Contract drawings are included which give specific locations for all work under this contract. Contract drawings may contain some specifications not found herein.

1.02 EXISTING FACILITIES ACCESS

- A. The project sites are located within public parks and the Argo Dam is adjacent to a canoe livery. The CONTRACTOR shall be responsible for maintaining access to existing facilities and the public. If access must be temporarily disrupted, the CONTRACTOR shall be responsible for coordinating his efforts with the OWNER or OWNER's REPRESENTATIVE and provide proper safety devices including signage and safety fencing.
- B. Access to existing facilities shall not be temporarily disrupted without coordination with and prior approval of the OWNER or OWNER's REPRESENTATIVE.

General Requirements

- C. CONTRACTOR can use the turnaround at the east end of the headrace as a storage area and may also use the Argo canoe livery fenced yard as a staging area of smaller equipment that must be secured. CONTRACTOR shall keep this canoe livery area locked at all times that it is not attended. CONTRACTOR shall daisy chain lock on all yard gates with OWNER's locks.
- D. When the path or portion of the path will be unavailable for pedestrian traffic, detour signage shall be posted for the mill race path. The detour shall be up Longshore Drive and around to the Broadway Bridge. Appropriate signage should be posted warning pedestrians of ongoing construction work. Safety of public users of this path shall be the responsibility of the CONTRACTOR.

1.03 CONSTRUCTION POWER

- A. Electrical power is not available at the project site. The CONTRACTOR shall be responsible for providing all power generation.

1.04 NOTIFICATION OF UTILITIES

- A. The CONTRACTOR shall notify all utilities prior to any excavation. Information regarding size and location is available from the utility.
- B. MISS DIG - The Detroit Edison Co., Consumers Energy Co., Michigan Consolidated Gas Co., and the telephone companies are members of a utility communication system called "MISS DIG" that provides service to participating utilities. The contractors shall contact "MISS DIG" not less than 72 hours before starting construction for assistance in locating utilities or for any work to be done on utilities.

1.05 WORK SCHEDULE

- A. The CONTRACTOR shall provide a work schedule. The schedule shall be complete and shall show in detail the manner in which he proposes to complete the work under this contract and approximately monthly billing of the Contract. The purpose of the schedule is to assist the OWNER in notifying the public of inconveniences and to anticipate cash-flow on the job, and to determine if the CONTRACTOR is reasonably proceeding with the work to assure completion within the specified time.

1.06 CONSTRUCTION SEQUENCE

- A. The CONTRACTOR shall coordinate and schedule his work with the OWNER when his operation may affect the existing facilities or the public access.
- B. Prior to commencing the work, the CONTRACTOR shall provide the OWNER or OWNER's REPRESENTATIVE a detailed schedule of the proposed work. The schedule shall include a list of tasks required to complete the work; their relevancy to each other; expected duration; and completion dates.
- C. As a guide in preparing a construction sequence for the most significant portions of the project, the CONTRACTOR shall use the following. All other proposed improvements may be constructed concurrently in accordance with an approved schedule.
 - 1. Argo Dam
 - a. Protect existing bridges.
 - b. Install soil erosion control measures.

General Requirements

- c. Construct temporary stone access drive down to the drain.
- d. Control on-site water as needed with temporary dams.
- e. Clear and chip the vegetation, including stumps, brush and fallen trees.
- f. Locate and temporarily mark all drain tile locations.
- g. Regrade ditch to final grades and place spoils on side slopes.
- h. Excavate as necessary to repair all damaged drain tiles.
- i. Repair all drain tiles, route clean, televise and mark with identification post.
- j. Stabilize the new ditch with rip rap and the embankment with erosion control measures.
- k. Cleanup and demobilize.

1.07 TRAFFIC MAINTENANCE

- A. All traffic control devices are the responsibility of the CONTRACTOR.
- B. Because accessibility to the parks and canoe livery is critical to the public, the CONTRACTOR shall not close the access to pedestrian traffic at any time without coordination with the OWNER.
- C. The construction influence zone shall be properly signed.
- D. Warning signs and detour signs shall be supplemented by safety fencing, barricades and plastic drums.
- E. At dangerous points throughout the work, provide and maintain safety fencing and barricades; all precautions shall be taken to protect the public from injury at no extra cost to the OWNER.
- F. Because the availability of roads and streets is critical for the traveling public, CONTRACTOR shall not close the road to traffic at any time. Through and local traffic shall always be maintained by the use of 2-lane construction techniques and by use of temporary roadways and flaggers as needed.
- G. The CONTRACTOR shall provide all required Type II and Type III barricades, flashers, flashing arrows, flaggers, and all signing required to properly and safely maintain traffic flow through the construction area in accordance with the Michigan Manual of Uniform Traffic Control Devices. The CONTRACTOR shall provide as many signs and barricades as required by the ENGINEER to protect and maintain traffic through this area at all times. The CONTRACTOR shall add any additional devices required by the ENGINEER to provide a smooth flow of traffic.
- H. The construction influence zone shall be properly signed in accordance with the recommendations outlined in the latest edition of the Michigan Manual of Uniform Traffic Control Devices.
- I. In case detours or other traffic instructions are necessary, suitable warning or direction signs shall be erected and maintained by the CONTRACTOR.

General Requirements

- J. In the event of the CONTRACTOR'S failure to comply with these provisions, the OWNER may with or without notice, cause the same to be done; and will deduct the cost of such work from any money due or to become due the CONTRACTOR under this contract, but the performance of such work by the OWNER or at his insistence, shall serve in no way to release the CONTRACTOR from his general or particular liability for the safety of the Public or the work.
- K. At dangerous points throughout the work, provide and maintain guard rails and colored lights, also flags; all possible precautions shall be taken to protect the workmen from injury at no extra cost to the OWNER.
- L. Access to fire hydrants and water valves shall always be maintained. The CONTRACTOR's truck and equipment operations on public streets shall be governed by City regulations, and all local traffic ordinances, and regulations of the Fire and Police Departments.
- M. The CONTRACTOR shall inform the local fire department in advance of his program of street obstruction, so that the fire department can set up plans for servicing the area in case of an emergency. He shall also notify the governing police department and the OWNER at least one week prior to obstructing any street according to the specifications set forth herein and/or as may be required elsewhere on the Drawings or specifications.

1.08 CONSTRUCTION PERMITS

- A. The CONTRACTOR will be required to follow the requirements established by all permits necessary for the construction of this project. The following is a list of all permits that must be obtained prior to the beginning of construction.
 - 1. Soil Erosion and Sedimentation Control Permit, as part of Public Act 451 (1994), Part 91 City of Ann Arbor.
 - 2. Act 346, Inland Lakes and Streams and Act 203, Wetlands permit part of the MDNRE Joint Permit.
 - 3. Permit to construct, operate, use and/or maintain within the right-of-way.
- B. The Soil Erosion and Sedimentation Control permit shall be applied for by the CONTRACTOR. The plan review fee will be paid for by the CONTRACTOR. The CONTRACTOR will be required to obtain the permit, pay all associated fees, and adhere to all requirements of the permit. The CONTRACTOR must submit a copy of the permit to the OWNER or OWNER's REPRESENTATIVE prior to construction.
- C. The permits for inland lakes and streams and wetlands shall be applied for and obtained by the OWNER through the MDNRE. The CONTRACTOR shall obtain a copy of the permit prior to beginning construction activities.
 - 1. The OWNER will apply for the inland lakes and streams permit after the Notice of Award. CONTRACTOR shall anticipate a 30 to 60 day period to obtain the permit. CONTRACTOR shall not mobilize until the permit is obtained. Prior to obtaining the permit, the CONTRACTOR shall submit required shop drawings.
- D. The permit to construct, operate, use and/or maintain within the City road right-of-way shall be applied for by the CONTRACTOR. The CONTRACTOR will be required to obtain the permit, pay for all inspection fees, bonds, insurance and submit a copy of the permit to the OWNER prior to construction.

General Requirements

1.09 CONSTRUCTION STAKING

- A. The CONTRACTOR will be required to provide any necessary construction staking services.

1.10 REFERENCE TO PLANS

- A. Construction plans for the existing Argo dam and powerhouse can be reviewed at the OWNER's or OWNER's REPRESENTATIVE's office in Ann Arbor, Michigan.

1.11 PROJECT PROGRESS MEETING

- A. It shall be the responsibility of the CONTRACTOR to have a representative present at each meeting. The meetings shall be held at least once a month or more frequently as directed by the OWNER or OWNER's REPRESENTATIVE.

1.12 LIQUIDATED DAMAGES

- A. In addition to the liquidated damages set forth by the General Conditions of the Contract, separate non-quantifiable liquidated damages in the following amounts will be applied.
 - 1. Embankment Seeding and Erosion Control: Liquidated Damages in the lump sum amount of \$20,000 if work not completed prior to October 1, 2011.

1.13 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. General

- 1. The method of measurement and the basis of payment for each item in the Bid Form will be as specified. There will be no payment allowed for any unit of work not specifically mentioned in the Bid Form as a bid item, and any such unit of work not mentioned in the Bid Form, but necessary for the completion of the Project, will be considered as incidental to the construction of the Project.

2. MEASUREMENT

Quantities of work completed under the Contract will be measured by the OWNER or OWNER's REPRESENTATIVE according to the United States standard measures. When measurements are stated in miles, stations, acres, they will be horizontal measurements unless specified otherwise. Where measurements are specified to be "in place," they will be taken along the actual surface of the completed item to obtain lineal, area, or volume measurements.

3. PAYMENT

In each and every instance where a Basis of Payment is specified, it shall be understood to be prefaced by the following statement, "The contract unit price bid in the Bid Form will be payment in full for all labor, materials, and equipment necessary to do the following according to the Plans and Specifications." Payment shall be made on the basis of the actual quantity of the item completed and accepted at the unit price for such item named in the Bid Form. Payment for landscaping, as specified under Section 02150, is incidental to the work. Surface restoration percentages identified under these items will not be paid until landscaping has been completed.

General Requirements

4. A description of the items generally serving as the basis of payment is included in the Bid Form – Section 1 Schedule of Prices.

END OF SECTION

SECTION 01210

ALLOWANCES

1.00 GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements for processing allowances.

1.02 DEFINITIONS

A. Lump Sum Allowance: A monetary sum that includes, as part of the Contract price, the associated costs and requirements to complete the specified allowance.

1.03 SUBMITTALS

A. Submit invoices for verification and use in fulfillment of each allowance.

1.04 OWNER'S INSTRUCTIONS

A. Use allowances only as directed for OWNER's purposes, and only by Change Orders which designate amounts to be charged to the allowance.

B. If the actual price for the specified allowance is more or less than the stated allowance, the contract price shall be adjusted accordingly by Change Order. The adjustment in contract price shall be made in accordance with the Contract.

C. At project closeout, any amounts remaining in allowances will be credited to OWNER by Change Order.

2.00 PRODUCTS

NOT USED

3.00 EXECUTION

3.01 LUMP SUM ALLOWANCE FOR PERMITS

A. Permits included

1. Refer to Section 01000.

B. An allowance for \$4,000 shall be included in the Contract price for procurement of permits. CONTRACTOR shall procure all specified permits and shall pay for this work under this Contract.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Certifications
- C. Shop Drawings
- D. Product Data
- E. Samples
- F. Manufacturers' Instructions
- G. Manufacturers' Field Reports
- H. Construction Schedule
- I. Submittal Schedule
- J. Schedule of Values

1.02 SUBMITTAL PROCEDURES

- A. Package each submittal appropriately for shipping and handling. This shall include an index either on the transmittal or within the submittal itself. Transmit each submittal from CONTRACTOR to ENGINEER using a transmittal form. Submittals received from sources other than CONTRACTOR will be returned without action. Use separate transmittals for items from different specification sections. Number each submittal consecutively. Resubmittals should have the same number as the original, plus a letter designation for each Resubmittal (i.e. 7-A, 7-B, etc.)
- B. Indicate on the transmittal relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include CONTRACTOR's certification that information complies with Contract Document requirements. On Resubmittal, all changes shall be clearly identified for ease of review. Resubmittals shall be reviewed for the clearly identified changes only. Any changes not clearly identified will not be reviewed and original submittal shall govern.
- C. Include the following information on the label for processing and recording action taken.
 - 1. Project name.
 - 2. Date.
 - 3. Name and address of ENGINEER.
 - 4. Name and address of CONTRACTOR.
 - 5. Name and address of subcontractor.
 - 6. Name and address of supplier.
 - 7. Name of manufacturer.
 - 8. Number and title of appropriate specification sections.
 - 9. Drawing number and detail references, as appropriate.
- D. Schedule submittals to expedite the Project, and deliver to ENGINEER at business address. Coordinate submission of related items. Coordinate related activities that require sequential activity.
- E. Review and approve Shop Drawings, project data, and samples before submitting them.

Submittal Procedures

- F. Verify field measurements, field construction criteria, catalog numbers, and similar data. Indicate on the submission exactly what was verified.
- G. Any markings done by CONTRACTOR shall be done in a color other than red. Red is reserved for ENGINEER's marking.
- H. The number of copies to be submitted will be determined at the pre-construction conference. Reproducible may be submitted and will be marked and returned to CONTRACTOR. Blue or black line prints shall be submitted in sufficient quantity for distribution to ENGINEER and OWNER recipients.
- I. Coordinate each submittal with the requirements of the Contract Documents.
- J. Provide space for CONTRACTOR and ENGINEER review stamps.
- K. Apply CONTRACTOR's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- L. Submit the number of copies that the CONTRACTOR requires, plus three (3) copies that will be retained by the OWNER and ENGINEER.
- M. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- N. No claim will be allowed for damages or extension of time because of delays in the work resulting from rejection of material or from revision and resubmittal of Shop Drawings, project data, or samples.
- O. No extension of Contract time will be authorized because of failure to transmit submittals to ENGINEER sufficiently in advance of the work to permit processing.
- P. ENGINEER reserves the right to withhold action on a submittal required coordination with other submittals until related submittals are received.
- Q. Do not install materials or equipment which require submittals until the submittals are returned with ENGINEER's/OWNER's stamp and initials or signature indicating approval. The OWNER shall have final approval authority.
- R. CONTRACTOR's responsibility of errors, omissions, and deviations from requirements of Contract Documents in submittals is not relieved by the ENGINEER's review.
- S. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with requirements.
- T. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- U. Revise and resubmit as required, identify all changes made since the previous submittal.

Submittal Procedures

1.03 CERTIFICATIONS

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the CONTRACTOR to ENGINEER, in quantities specified for Product Data.
- B. Indicate that the material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certifications may be recent or previous test results of the material or product, but must be acceptable to ENGINEER.

1.04 SHOP DRAWINGS

- A. Shop Drawings: Submit to ENGINEER for review for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Produce copies and distribute in accordance with SUBMITTAL PROCEDURES.
- B. Submit Shop Drawings for all materials on the project whether identified in the specifications or not.
- C. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the project is not considered Shop Drawings.
- D. Shop drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates, and similar Drawings. Include the following information:
 - 1. Dimension.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurements.
- E. Shop drawings shall indicate shop painting requirements to include type of paint and manufacturer.
- F. Standard manufactured items in the form of catalog work sheets showing illustrated cuts of the items to be furnished, scale details, sizes, dimensions, quantity, and all other pertinent information should be submitted and approved in a similar manner.
- G. Measurements given on shop drawings or standard catalog sheets, as established from contract drawings and as approved by ENGINEER, shall be followed. When it is necessary to verify field measurements, they shall be checked and established by CONTRACTOR. The field measurements so established shall be followed by CONTRACTOR and by all affected trades.

1.05 PRODUCT DATA

- A. Product Data: Submit to ENGINEER for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. Provide copies and distribute in accordance with SUBMITTAL PROCEDURES article.

Submittal Procedures

- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents.

1.06 SAMPLES

- A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include brick samples, mortar samples, mock-up walls, color range sets, and swatches showing color, texture, and pattern. Refer also to individual specification sections.
- B. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match ENGINEER's sample. Include the following:
 - 1. Generic description of the sample.
 - 2. Sample source.
 - 3. Product name or name of manufacturer.
 - 4. Compliance with recognized standards.
 - 5. Availability and delivery time.
- C. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- D. Refer to other specifications sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
- E. Preliminary Submittals: Where samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
 - 1. Preliminary Submittals will be reviewed and returned with ENGINEER's mark indicating selection and other action.
- F. Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
- G. Maintain sets of samples, as returned, at the site, for quality comparisons throughout the course of construction.
- H. Unless noncompliance with Contract Document provisions is observed the sample may serve as the final submittal.
- I. Sample sets may be used to obtain final acceptance of the construction associated with each set.

1.07 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to ENGINEER for delivery to OWNER in quantities specified for Product Data.

Submittal Procedures

- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.08 CONSTRUCTION SCHEDULE

A. Bar Chart Schedule:

1. Prepare a fully developed, horizontal bar chart type construction schedule. Submit within 14 days of the Notice to Proceed.
2. Provide a separate item bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated on schedule of values.
3. Prepare schedule of sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for entire construction period.
4. Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on schedule with other construction activities, including the OWNER's operation of the facility and other Contractors on site; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.
5. Coordinate construction schedule with schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other schedules.
6. Indicate completion in advance of the date established for substantial completion. Indicate substantial completion of schedule to allow time for ENGINEER's procedures necessary for certification of substantial completion.

- B. Schedule Updating: Revise schedule after each meeting or activity, where revisions have been recognized or made within two weeks following the meeting or activity.

1. An updated schedule must be submitted with each application for payment.

1.09 SUBMITTAL SCHEDULE

- A. After development and acceptance of the construction schedule, prepare a complete schedule of submittals. Submit schedule within 14 days of the Notice to Proceed.
- B. Coordinate submittal schedule with the list of subcontracts, schedule of values, and the list of products as well as construction schedule.
- C. Prepare schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 1. Scheduled date for the first submittal.
 2. Related section number.
 3. Submittal category.
 4. Name of subcontractor.
 5. Description of the part of the work covered.
 6. Scheduled date for Resubmittal.
 7. Scheduled date ENGINEER's final release or approval.

Submittal Procedures

- D. Following response to initial submittal, print and distribute copies to ENGINEER, OWNER, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
- E. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
- F. Schedule Updating: Revise schedule after each meeting or activity, where revisions have been recognized or made within two weeks following the meeting or activity.

1.10 SCHEDULE OF VALUES

A. Schedule of Values

1. Within thirty (30) days after issuance of the Notice to Proceed, the CONTRACTOR shall submit two (2) copies of the proposed schedule of values for the OWNER's review and approval.
2. Schedule of values shall be revised as needed based on OWNER's comments.
3. The schedule of values shall be organized according to specification divisions.
4. Schedule of values shall include sufficient breakdown for tracking all costs associated with each of the following (at a minimum):
 - Mobilization
 - Soil erosion control
 - Demolition
 - Traffic control
 - Toe drain cleaning and televising
 - Toe drain repair
 - Riprap
 - Shrubs/plantings
 - Restoration
 - Project closeout
5. A Lump Sum Payment equal to 1-1/2% of the total Bid Price (to include all bonds, insurance, move-on expenses, etc.) will be allowed for "mobilization" as a progress payment line item. The actual cost of bonds and insurance (up to the maximum payment of 1-1/2%) will be considered in the initial payment request provided that cost documentation suitable to the OWNER is furnished by the CONTRACTOR. Any outstanding balance of the mobilization line item will be payable when the Project work is 10% complete as indicated by the approved progress payments (less cost of mobilization and stored equipment).

2.00 PRODUCTS

Not Applicable

Submittal Procedures

3.00 EXECUTION

3.01 ENGINEER'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, ENGINEER will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is CONTRACTOR's responsibility.
- B. Action Stamp: ENGINEER will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. Final Unrestricted Release: Where submittals are marked "No Exceptions Taken" that part of the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents; final acceptance will depend upon the compliance.
 - 2. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted" that part of the work covered by the submittal may proceed, provided it complies with notation or correction on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 3. Returned for Resubmittal: When submittal is marked "Rejected" or "Revise and Resubmit" do not proceed with the part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Rejected" or "Revise and Resubmit" to be used at site, or elsewhere where work is in progress.
 - 4. Additional Information Needed: When submittal is marked "Submit Specified Item" CONTRACTOR shall submit requested information.
 - 5. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Acknowledge Receipt".
 - 6. The approval of ENGINEER shall not relieve CONTRACTOR of responsibility for errors on drawings or submittals as ENGINEER's checking is intended to cover compliance with drawings and specifications and not enter into every detail of the shop work.

END OF SECTION

SECTION 02010

SITE GENERAL PROVISIONS

1.00 GENERAL

1.01 DESCRIPTION

- A. The CONTRACTOR shall provide all labor, materials, tools and equipment necessary for the preparation and completion of the site of the project.

1.02 CLEARING AND GRUBBING

- A. The CONTRACTOR shall clear and grub the ditch work area and embankment of all wild brush, trees, and debris which may be present and interfering with construction and shall remove and dispose of the same. There are approximately 100 to 120 trees (6" to 20") that must be felled and their stumps removed along the ditch work area.
- B. Prior to the Notice to Proceed, the OWNER will remove all trees (leaving only the stumps) and cut down brush located on the embankment between the ditch and the head race. The CONTRACTOR must remove all stumps and pull out any remaining brush on the embankment.
- C. Project includes an approximate total of 120 trees that must be felled and their stumps removed, and another 90 stumps that must be removed.
- D. No clearing or grubbing is required on the secondary embankment between the ditch and the river, unless necessary for spoils placement. The CONTRACTOR shall take care to not disturb landmark trees located on this embankment.
- E. All cleared vegetation and brush can be chipped on site for final disposal. All cleared vegetation including stumps and brush must be removed from the site and properly disposed of. No burning of vegetation will be allowed.
- F. The width of the cleared area along the banks shall be sufficient to dispose of the excavated earth in accordance with the drain improvements.

1.03 PROTECTION OF TREES

- A. Existing trees within the area of work which are indicated as landmark trees on the Plans are to be saved and shall be protected in accordance with the Standard Details in Division X of the City's Standard Specifications.
- B. Damage to City owned landmark trees by the CONTRACTOR's operation(s) or the operation(s) of the CONTRACTOR's subcontractor(s) or supplier(s) shall be repaired under the direction of the City Forester by an approved forestry contractor retained by the CONTRACTOR; or, at the discretion of the City Forester, the required repairs may be performed by the City Forester with all associated costs being charged directly to the CONTRACTOR. Payment of these charges is the CONTRACTOR's responsibility and is not a part of any City Project Contract.
- C. Protection of trees shall be with standard 48" high orange snow fencing located at the outer perimeter of the spread of branches, or closer only at the direction of the OWNER.
- D. Posts shall be standard steel or wooden posts at 6' on center.

Site General Provisions

1.04 TREE REMOVAL

- A. Those trees and/or tree limbs that would impede the logical progression of the channel excavation and all equipment necessary thereto shall be removed. Remove all stumps located in the bottom of the drain. Stump removal and disposal is incidental to the work.
- B. CONTRACTOR shall protect all trees greater than 6-inches in diameter and shall seek the approval of the OWNER or OWNER's REPRESENTATIVE prior to removing trees greater than 6-inches.
- C. Trees which interfere with the work, and the removal of which is permitted, shall be removed by the CONTRACTOR at his expense and in a safe manner. Such tree removal shall not be a pay item but considered incidental to the work. Where trees are to be removed or are permitted to be removed by the OWNER or OWNER's REPRESENTATIVE, the CONTRACTOR shall remove such trees and stumps to a depth of at least one foot below the proposed finish grade. All stumps, roots, logs, branches, brush and debris shall be chipped on site or removed from the site and disposed of by the CONTRACTOR.

1.05 ACCESS DRIVE

- A. The CONTRACTOR shall locate a permanent access drive to facilitate access to and from the project site. CONTRACTOR shall place suitable subgrade and base materials.
- B. The CONTRACTOR shall submit a proposed site access plan to the OWNER and ENGINEER for review and approval. The access plan shall include locations of equipment access, bridge crossing details, materials storage locations and identify how equipment will access the ditch line.
- C. The CONTRACTOR may elect to install additional temporary access drives to facilitate construction. The location of these temporary drives shall be subject to the OWNER's approval. The temporary drives shall be removed and fully restored at the completion of the project.
- D. The CONTRACTOR shall include details on the protection of the two existing site bridges located at the east and west ends of the project. The bridges must be protected by installing ramps up to structural beams covered with plating to sufficiently support the full load of all construction equipment. The structural supports shall be designed by the CONTRACTOR and stamped by a structural engineer in the State of Michigan.

1.06 WORK AREA AND STORAGE OF MATERIALS

- A. The working area shall be organized in an orderly manner with storage and tool sheds, offices and sanitary facilities, parking areas for employees, and all other necessary facilities developed and maintained by the CONTRACTOR. The CONTRACTOR shall keep the site and all haul roads reasonably clean and dust free.
- B. All materials, supplies and equipment, whether furnished by the CONTRACTOR or by the OWNER, shall be delivered, stored and handled as to prevent the inclusion of foreign materials and/or damage by water, freezing, breakage or other causes. The OWNER or OWNER's REPRESENTATIVE may require the CONTRACTOR to provide an enclosed storage shed for the storage of the above mentioned materials, supplies and equipment. Packaged materials shall be delivered in the original unopened containers and shall be stored until ready for use. All materials which have been stored shall meet the requirements of the Specifications at the time they are used in the project.

Site General Provisions

- C. The storage and staging areas shall be restored to existing condition, or better, following the completion of the work.

1.07 EXISTING UTILITIES

- A. Existing utilities and underground structures, such as manholes and drain lines are shown on the Plans. The information shown is believed to be reasonably correct and complete; however, neither the correctness nor the completeness of such information is guaranteed.
- B. The CONTRACTOR shall conduct his operations so as not to damage any existing utility whether shown in the Plans or not. The CONTRACTOR shall correct, at his own expense, any damage caused during the operations of his subcontractors or suppliers.
- C. If the CONTRACTOR desires, or is required by the utility companies, to relocate or protect any power or telephone poles to facilitate his work, any expense encountered from such relocation shall be borne by the CONTRACTOR.

1.08 NOTIFICATION TO UTILITIES

- A. Prior to the start of any operations in the vicinity of any utilities, the CONTRACTOR shall notify the utility companies and request that they stake out the locations of the utilities in question.

1.09 SANITARY REQUIREMENTS

- A. The CONTRACTOR shall provide adequate sanitary facilities for all persons employed on the project. The sanitary facilities shall conform in every way to the requirements of the "General Safety Rules and Regulations for the Construction Industry."

1.10 DEWATERING

- A. CONTRACTOR shall dewater for the purposes of facilitating construction. Only local dewatering shall be utilized; dewatering well points are not permissible.
- B. Adequate pumping and drainage facilities shall be provided and water, from whatever source, entering the work during any stage of construction shall be removed promptly and disposed of in a manner satisfactory to the OWNER or OWNER's REPRESENTATIVE. All pumping and drainage shall be done with no damage to property or structures and without interference with the right of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. Dewatering shall be done in such a manner that the soil under or adjacent to existing structures shall not be disturbed, removed or displaced.
- C. Dewatering shall not directly discharge to any waterway without adequate filtration in the form of Dandy bags, silt socks, or other OWNER or OWNER's REPRESENTATIVE's approval equal.

1.11 WINTER CONSTRUCTION

- A. The OWNER or OWNER's REPRESENTATIVE shall have permissive authority over the work which is proposed to be done during the winter months. The CONTRACTOR shall provide adequate weather protection, temporary heating and take any other measures which are necessary to insure that the work performed during the winter months is properly installed.

Site General Provisions

2.00 PRODUCTS

Not Applicable

3.00 EXECUTION

3.01 CONTROL OF WATER POLLUTION AND SILTATION

A. General Requirements

1. The CONTRACTOR shall conduct his work in a manner to comply with the Soil Erosion and Sedimentation Control Act of 1972, (MICH P.A. 347) that will not cause damaging siltation or pollution of the water in streams, rivers, lakes and reservoirs. The OWNER or OWNER's REPRESENTATIVE shall advise the Michigan Department of Natural Resources and Environment (MDNRE) of the proposed work. All work of water pollution and siltation control is subject to inspection by the MDNRE.
2. All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the Contract.
3. Construction operations shall be conducted in such manner as to reduce erosion to the practicable minimum and prevent damaging siltation to streams or lakes. The area of erodible land exposed to the elements by grading operations, including storage areas and haul roads, at any one time shall be subject to approval of the OWNER or OWNER's REPRESENTATIVE and the duration of such exposure prior to final trimming and finishing of the areas shall be as short as practical. The OWNER or OWNER's REPRESENTATIVE shall have full authority to order the suspension of grading and other operations pending adequate and proper performance of trimming, finishing and maintenance work or to restrict the area of erodible land exposed to the elements.
4. Gravel or stone, consisting of durable particles of rock and containing only negligible quantities of fines, shall be used for construction pads, haul roads and temporary roads in or across streams.
5. The disturbance of lands and waters that are outside the limits of construction is prohibited, except as found necessary and approved by the OWNER or OWNER's REPRESENTATIVE.
6. The CONTRACTOR shall conduct his work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemicals, sewage or other harmful materials into streams, rivers, lakes or reservoirs.
7. Water from aggregate washing or other operations containing sediment shall be treated by filtration, by use of a settling basin or other means to reduce the sediment content to a level acceptable to the MDNRE.
8. All waterways shall be cleared as soon as practical of falsework, piling, debris or other obstructions placed during construction operations not a part of the finished work. Care shall be taken during construction and removal of such barriers to minimize the muddying of a stream.

Site General Provisions

B. Temporary Control Requirements

1. The CONTRACTOR shall provide temporary soil erosion and sedimental controls according to current local soil conservation district soil erosion and sedimentation control standards and specifications or revisions thereof.
2. The CONTRACTOR shall not pump or bail water directly from the excavation into the river but shall construct and maintain stilling basins to receive the pumpage with an overflow from the basins to the river. The basins shall be of sufficient size to allow proper settling of sediment before the water flows into the river. The CONTRACTOR shall remove and/or restore the basin area to original condition after backfilling is complete.
3. Permanent soil erosion control measures for all slopes, channels, ditches or any disturbed land area shall be completed within 15 calendar days after final grading or the final earth change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented within 30 calendar days. All temporary soil erosion control measures shall be maintained until permanent soil erosion control measures are implemented.

3.02 FINISH GRADING, TOP SOIL

- A. After all backfilling and rough grading has been completed and thoroughly compacted, the entire disturbed area at the site shall be graded to smooth, even surfaces. The portion of the disturbed area where no new contours are shown on the Plans shall be graded to smooth, even surfaces approximating to or meeting the original surfaces.
- B. Under Alternate Bid Item B, after all construction has been completed the CONTRACTOR shall spread 3 inches of clean imported top soil over the entire embankment and all other disturbed areas.

END OF SECTION

SECTION 02040

EARTHWORK

1.00 GENERAL

1.01 DESCRIPTION

- A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and spoil material, riprap and the restoration and final grading for all earth surfaces.

2.00 PRODUCTS

2.01 BACKFILL MATERIAL

- A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site.
- B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.
- C. Riprap
1. Riprap shall be 3" to 6" clean washed natural stone.
 2. Heavy duty riprap shall be $D_{50} = 12"$.
 3. Riprap shall be placed where shown on the Plans and in conformance with the MDOT Standard Specifications for Construction.
 4. The riprap may either be placed by hand or machine, so long as a uniform cross-section is obtained in accordance with the Drawings and without damage to the geotextile fabric.
- D. Bedding shall be pea gravel or crushed stone conforming to ASTM C33 size No. 67. Bedding is defined as the material placed around the bottom, sides and top of the pipe.

3.00 EXECUTION

3.01 GENERAL EXCAVATION

- A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.
- B. All excavation may be open cut from the surface.
- C. If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the OWNER or OWNER's REPRESENTATIVE, before the construction work proceeds.

Earthwork

- D. The excavation shall be kept as dry as possible during the work. Where water is encountered in the excavation, it shall be removed by pumping, draining or bailing into stilling basins.

3.02 EXCAVATION FOR DRAINAGE PIPING

- A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.
- B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.
- C. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.

3.03 BACKFILLING FOR DRAINAGE PIPING

- A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:
 - 1. For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

3.04 BACKFILLING FOR STUMP REMOVAL

- A. CONTRACTOR shall supply backfill of the same soil classification as is currently found in the embankment under the topsoil layer. Soil borings along the embankment are attached in the Appendix for reference. CONTRACTOR shall provide a gradation of the proposed backfill for OWNERS approval prior to placement. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

3.05 GRADING

- A. The CONTRACTOR shall grade the site to achieve the intent of the project and the requirements as shown on the Plans. The area of disturbance shall be kept to a minimum. All disturbed areas shall be restored to prior condition.
- B. Immediately before seeding, the topsoil surface shall be reworked until the seedbed is a fine pulverized, smooth seedbed, varying not more than 1/2-inch in 10 ft. Rake out rocks more than two inches in diameter, roots, litter and all foreign matter.
- C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.

Earthwork

3.06 SPOIL GRADING

- A. The excavated material (spoil) shall be graded to a smooth contour along the sides of the ditch at the earliest practical time after excavation in accordance with the typical cross-section detail. The ditch shall not be permanently filled in or blocked with the excavated spoils. The CONTRACTOR will be responsible for assuring that critical existing drainage patterns along the project route are maintained.

3.07 RESTORATION

- A. Where the excavation is located beside a ditch and/or where an existing ditch is disturbed in the CONTRACTOR's operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.
- B. The final condition of the project site, storage areas, streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the OWNER or OWNER's REPRESENTATIVE.

END OF SECTION

SECTION 02110

STORM SEWERS AND DRAINAGE PIPING

1.00 GENERAL

1.01 DESCRIPTION

A. Furnish all labor, tools, equipment and materials to construct all drain piping as herein specified.

1.02 TESTING

A. Submittals

1. The CONTRACTOR shall submit shop drawings or data sheets for all products.

2.00 PRODUCTS

2.01 DRAIN PIPE

A. Polyvinyl Chloride Pipe (PVC); ASTM D 1785, Schedule 80.

B. Perforated Polyvinyl Chloride Pipe; MDOT SECT. 909.07A.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill above the pipe shall conform to Section 02040, Earthwork.

B. Pipe shall be laid on a bed of pea gravel material placed on the bottom of the trench to a depth of not less than 3 inches.

C. Pea gravel material shall be placed at the sides of the pipe and cover not less than 4 inches over the pipe.

3.02 PIPE CONNECTIONS

A. CONTRACTOR shall be responsible for the connections to existing piping. CONTRACTOR shall provide all labor and materials, including any necessary couplings, sleeves or adaptors, as approved by the OWNER or OWNER's REPRESENTATIVE, to transition from one material to another and ensure a leak-tight connection.

B. When a new section of pipe is to be installed in-line with an existing pipe, the CONTRACTOR may use a compression-type coupling with shear rings. Clamps and shear ring shall be stainless steel. The following types of couplings may be used:

1. Fernco Series 1001-66 or OWNER or OWNER's REPRESENTATIVE approved equal.

3.03 DRAIN TILES

A. All drain tiles shall be thoroughly cleaned of all silt, roots, vegetation and debris by mechanical routing to a distance of 30 feet into the drain. CONTRACTOR shall not use water jets in the cleaning of the drain tiles. Routing of existing drain tiles shall not compromise their integrity.

Storm Sewers and Drainage Structures

- B. All drain tiles shall be video inspected after cleaning. The video equipment shall be suitable for viewing the full perimeter of the pipe with full color. The video shall display the following information:
 - 1. Date and time
 - 2. Drain tile number
 - 3. Footage Counter
- C. After the Work is completed, the CONTRACTOR shall provide the OWNER with three (3) copies of the video inspection. The video inspection shall be in DVD format and shall become property of the OWNER.
- D. Where drain tiles need adjustment or replacement, they shall be set to original invert elevations or placed to the grades as shown on the plans. They shall be laid on a 3-inch bedding of pea gravel.

END OF SECTION

SECTION 02150

LANDSCAPING

1.00 GENERAL

1.01 DESCRIPTION

- A. Under this Section the CONTRACTOR shall furnish all labor, materials, and equipment necessary to establish permanent seeding, erosion control mats and geotextile fabric. Temporary measures shall be utilized to stabilize erosive or sediment-producing areas during the construction period.
- B. The seeding operations shall not be started until all CONTRACTORS on the site have fully completed their work. Any seeded areas damaged by other trades performing work at the site shall be fully repaired or replaced at the expense of the CONTRACTOR.

1.02 SEEDING REQUIREMENTS

- A. The CONTRACTOR shall permanently prepare seed, stabilize and riprap the areas designated on the Plans or disturbed by the CONTRACTOR. All disturbed areas not receiving stone or riprap shall be stabilized with erosion control mats. Riprap with geotextile fabric shall be placed where shown on the Plans or required by the OWNER or OWNER's REPRESENTATIVE.
- B. Seeding must be accomplished between August 10, 2011 and October 1, 2011.

1.03 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall assume responsibility for maintaining his work to the end of the guarantee period. This guarantee period shall last for a period of two (2) years. During this period, the CONTRACTOR shall make a minimum of one maintenance trip every four weeks, after each rain event and as many more as necessary to keep the plantings in a thriving, stable condition and to repair any soil erosion. Maintenance shall include at a minimum watering, fertilization and mowing.
- B. The CONTRACTOR shall reseed all bare or thin spots as required or as identified by the OWNER or OWNER's REPRESENTATIVE.
- C. The CONTRACTOR shall not assume responsibility for damages or loss of plants or trees caused by fire, flood, lightning storms, freezing rains, winds over 60 miles per hour or vandalism.
- D. At the end of the guarantee period, the CONTRACTOR shall remove all temporary soil erosion control measures from the site.

2.00 PRODUCTS

2.01 SEED

- A. Refer to Appendix for the detailed seed mix and application rate. Seed mix shall be applied over all disturbed areas on this project.
- B. Seed shall be fresh, clean, new-crop seed. The CONTRACTOR shall furnish to the OWNER or OWNER's REPRESENTATIVE the dealer's guaranteed statement of the composition of the mixture and the percentages of purity and germination of each variety. No substitute seed mixtures will be accepted.

Landscaping

2.02 EROSION CONTROL MATS

- A. All disturbed areas not receiving stone or riprap shall be stabilized with erosion control mats.
- B. Erosion control mats shall be NAGreen SC150BN Extended Term Biodegradable Erosion Control Mats as manufactured by North American Green (www.nagreen.com).
- C. Erosion control mats shall be installed per manufacturer's instructions. Erosion control mats must be properly anchored in a trench at the top of the embankment. Along the slope, 6" wooden Ecostakes shall be placed at a minimum rate of 1.7 stakes per square yard. Overlapping sections of erosion control mat shall be staked as per the manufacturer's requirements. Metal staples are not permitted.

2.03 GEOTEXTILE FABRIC

- A. Geotextile fabric shall be placed beneath all riprap.
- B. Geotextile fabric shall be Mirafi 180N.

2.04 HERBICIDE

- A. Cut stumps from trees and brush shall be treated with Pathfinder II herbicide, manufactured by Dow AgroSciences. During the two (2) year warranty period any noticeable regrowth of brush shall be treated with herbicide. Care shall be taken to ensure the herbicide does not enter the water near the ditch or river.

3.00 EXECUTION

3.01 PERMANENT SEEDING

- A. Topsoil shall be worked to a smooth uniform surface and compacted firmly. Any lumps or depressions which occur shall be regraded and re-rolled until a satisfactory grade is obtained.
- B. Immediately before seeding, the topsoil surface shall be reworked until the seedbed is a fine pulverized, smooth seedbed, varying not more than 1/2-inch in 10 ft.
- C. Seed as specified shall be evenly sown at the rate prescribed by the seed supplier, and lightly worked into the surface, using a mechanical seeder. The CONTRACTOR may increase the quantity of seed at his option at no increase in cost to the OWNER.

3.02 EMBANKMENT PREPARATION

- A. All trees on the embankment (not including the ditch) will be cut under a separate contract. Under this contract the CONTRACTOR shall remove all stumps located on the embankment. All vegetation including brush and stumps shall be removed and disposed of offsite by the CONTRACTOR.
- B. No vegetation removal shall occur within 10 feet of the Purple Turtlehead population. Care shall be taken to ensure cut vegetation does not fall into the population.
- C. CONTRACTOR shall rake embankment surface clear of duff after clearing and grubbing is complete. The top 4-inches of existing topsoil shall be mechanically tilled. Embankment shall be seeded with the seed mix attached in the Appendix. Erosion control mats shall be installed from the top of the embankment down to the ditch for the continuous length of the embankment.

Landscaping

- D. Embankment area is approximately 50,000 square feet. Payment for embankment preparation shall be on a lump sum basis. CONTRACTOR shall familiarize himself with the existing site conditions prior to bidding.
- E. Alternate Bid Item B shall require the placement of 3-inches of clean topsoil over the embankment in lieu of mechanically tilling the top 4-inches of the existing topsoil. Topsoil must be clean topsoil imported to the site from an outside source. A certified analysis of the topsoil from each source shall be submitted to the ENGINEER for approval before delivery to the site.

END OF SECTION

SECTION 02420

ROCK-FILLED GABIONS

1.00 GENERAL

1.01 DESCRIPTION

- A. Work using gabion type protection shall include the furnishing of all labor, materials and tools required for excavation and/or backfill, and to construct and place all gabion baskets, and filter fabric for a complete and functioning installation in accordance with the Contract Documents including but not limited to the following items:
 - 1. Slope shaping and preparations for placement of gabions including excavation.
 - 2. Placement of filter fabric, gabion baskets, rock fill, and earth backfill.
- B. This work shall be installed by a contractor experienced in this type of work and one who has a successful record of job performance in work of a similar nature.

1.02 QUALITY ASSURANCE

- A. Work specified under this Section shall be supervised by a full-time superintendent or technical specialist who shall be thoroughly trained and experienced in the type of work.

2.00 PRODUCTS

2.01 GABIONS

- A. Box gabions shall consist of rectangular units fabricated from a double twisted, hexagonal woven steel wire mesh as per ASTM 975. Steel wire mesh shall be soft temper galvanized and PVC coated steel wire Gabions shall be Maccaferri Galvanized and PVC Coated Gabions or approved equal. PVC coating shall be black in color.
- B. In place dimensions of box gabions units shall be as shown on the drawings or recommended by the manufacturer. When multiple gabion units are required to meet the size requirement, units shall be properly connected together per manufacturer's requirements.
- C. Mesh openings are to be approximately 3-1/4" x 4-1/2" in dimension.
- D. The number and location of diaphragms are to comply with the recommendations of the manufacturer.
- E. Mesh wires shall be not less than U.S. Gage 11.
- F. Mesh panels are to be reinforced at all edges with galvanized wire not less than U.S. Gage 9.
- G. Panels are to be assembled, laced, and bound together using galvanized wire not less than U.S. Gage 13-1/2.
- H. All wire is to meet Federal Specifications QQ-W-61g, soft.
- I. Galvanizing is to meet Federal Specifications QQ-W-461g, finish SJ Class 3.

Rock-Filled Gabions

2.02 STONE FILL

- A. Fill for gabions shall be sound natural stone.
- B. Gabion fill shall be nominal 4- to 8-inches uniformly graded or as approved by ENGINEER.

2.03 FILTER FABRIC

- A. Geotextile filter fabric shall be Mirafi 180N or approved equal.

3.00 EXECUTION

3.01 FILTER FABRIC

- A. The fabric shall be placed in a manner and at the locations shown on the drawings. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The surface to receive fabric shall be prepared to a relatively smooth condition free of obstructions, depressions, debris, and soft or low density pockets of material. The fabric shall be placed with the long dimension parallel to the centerline of the structure and shall be laid smooth and free of tension, stress, folds, wrinkles or creases. It shall be laid in such manner as to prevent tension breaks due to settlement. The strips shall be placed to provide a minimum width of twelve (12) inches of overlap for each joint. Any damage to the fabric during its installation or during placement of cover shall be replaced by the CONTRACTOR at no cost to the OWNER.

3.02 GABIONS

- A. Assembly, installation, and filling of gabions shall be in accordance with the manufacturer's recommendations.
 - 1. In assembling gabions they shall be first laid on a hard flat surface, stretched and all kinks removed. They shall then be folded and laced together using wire provided by the manufacturer.
 - 2. Before installing gabions, the ground surface shall be previously prepared and be relatively smooth and even.
 - 3. Gabions shall be placed empty and securely laced to adjacent gabions along the perimeter of all contact surfaces. Prior to filling, each tier shall be placed along the length of the proposed wall. Prior to filling each tier, the first gabion shall be firmly anchored and tension shall be applied to the other end with a come-along or other means, in order to achieve proper alignment.
 - 4. The base of empty gabions placed on top of a completed tier shall be tightly wired to the later.
 - 5. Gabions are to be filled in one foot lifts. Following each lift all exposed faces are to be tied together with two (2) connecting wires.
 - 6. Gabions may be filled by payloader, gradall, crane, conveyor or similar earth moving equipment with manual stone adjustment during filling to prevent undue voids.

Rock-Filled Gabions

7. The exposed faces shall be hand-placed using selected stone to prevent the gabions from bulging and to present a pleasant appearance. The last lift of stone shall be level with the top of the gabion to allow proper closing of the lid and provide an even surface for the next course.
8. Following placement of this stone, the lid shall be folded down and securely laced to ends, sides, and diaphragms.
9. Backfill and filter fabric shall be placed behind the gabions in lifts equal to the unit heights (approximately 3 ft) of the gabions as the wall is being constructed.

3.03 FIELD STONE RIP RAP

- A. Rip rap for placement on the gabion foundation shall be natural field stone. Rip Rap shall be landscape grade with varied natural colors and a D_{50} of 12" to 18". Limestone and crushed concrete rip rap is not acceptable.

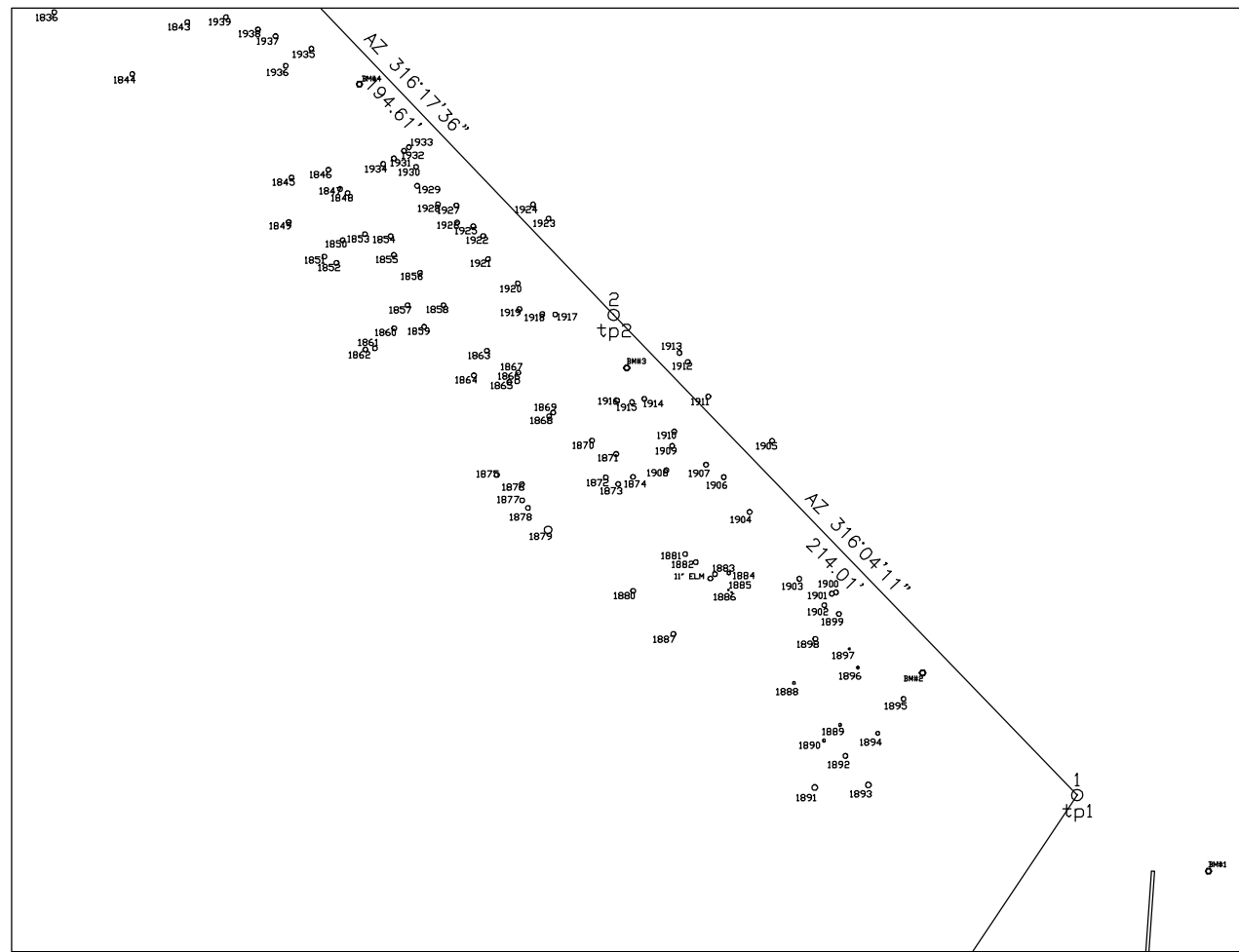
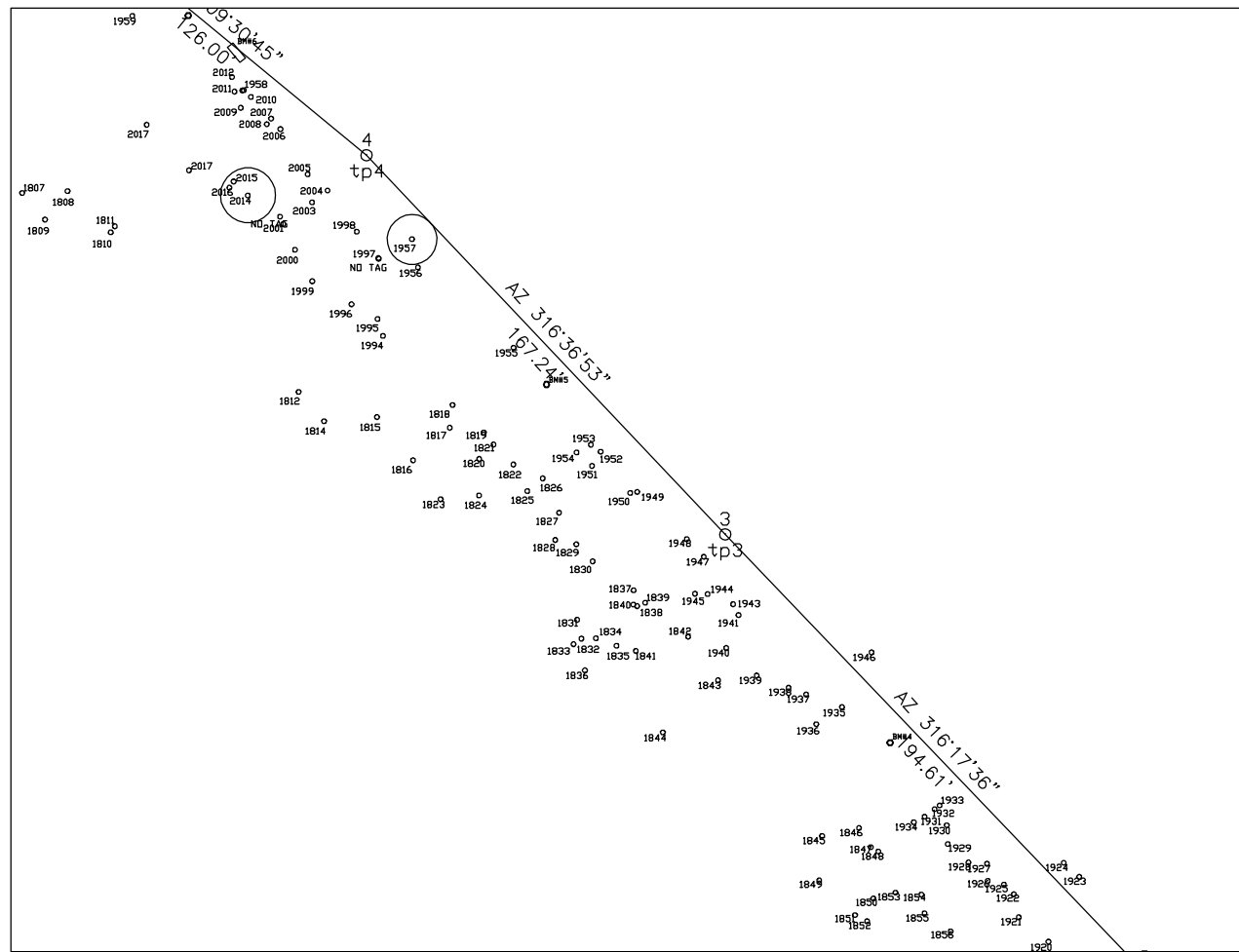
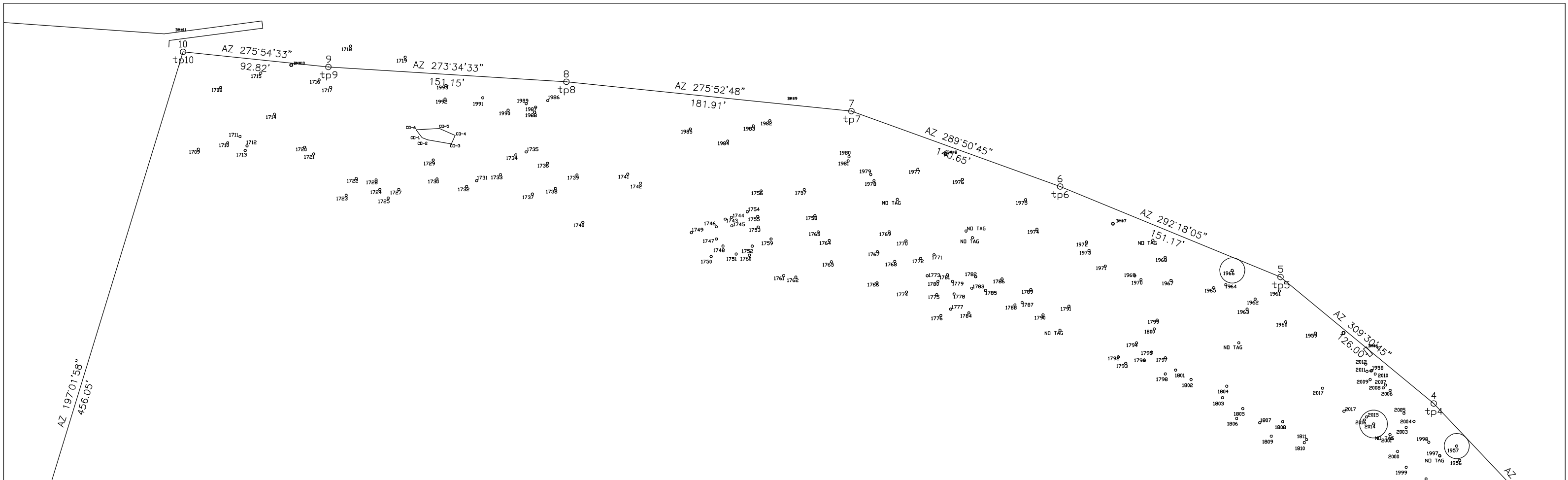
END OF SECTION

APPENDIX
Argo Dam Seed Mix

Argo Dam Toe Drain Improvements Seed Mix

Bromus pubescens or B. purgans (Woodland Brome)	2 lbs/acre
Carex brevior (Plains Oval Sedge)	0.25 lbs/acre
Carex cristatella (Crested Oval Sedge)	0.1 lbs/acre
Carex molesta (Field Oval Sedge)	0.25 lbs/acre
Elymus canadensis (Canada Wild Rye)	2 lbs/acre
Hystrix patula (Bottlebrush Grass)	2 lbs/acre
Juncus tenuis (Path rush)	0.02 lbs/acre
Creeping Red Fescue "Lustrous"	10 lbs/acre

APPENDIX
Argo Dam Tree Survey



Argo Survey Tree Tag Database

TAG	SIZE	TYPE	CONDITION
1708	16" & 11"	Mulberry	Inv.
1709	8" & 4" & 10"	Blac Willow	
1710	11"	Elm-Rock	
1711	38"	Cottonwood	LM
1712	26"	Cottonwood	LM
1713	8"	Mulberry	Inv.
1714	6" & 5"	Hawthorne	Poor
1715	9"	Tree of Heaven	Inv.
1716	8"	Ash	Dead
1717	13"	Elm-Rock	
1718	17"	Red Maple	
1719	14"	Cottonwood	
1720	11"	Sugar Maple	
1721	19"	Black Willow	Poor
1722	20"	Black Willow	
1723	18"	Black Willow	
1724	10"	Elm-Rock	
1725	14"	Black Willow	
1726	9"	Basswood	
1727	24"	Black Willow	LM
1728	8" & 9"	Mulberry	Inv.
1729	30" & 28"	Black Willow	Very Poor
1730	10"	Mulberry	Inv.
1731	30" & 35"	Black Willow	Very Poor
1732	11"	Mulberry	Inv.
1733	9"	Elm-Rock	
1734	23"	Black Willow	
1735	15"	Black Willow	Poor - Top is gone
1736	21"	Black Willow	
1737	15"	Black Willow	
1738	31"	Cottonwood	LM
1739	23"	Black Willow	Poor-top is gone
1740	24"	Cottonwood	LM
1741	7"	Mulberry	Inv.
1742	12"	Tree of Heaven	Inv.
1743	31"	Cottonwood	LM
1744	7"	Mulberry	Inv.
1745	7"	Mulberry	Inv.
1746	7"	Elm-Rock	
1747	17"	Cottonwood	
1748	22"	Cottonwood	
1749	13" & 18"	Mulberry	Inv.
1750	24"	Cottonwood	LM
1751	8"	Mulberry	Inv.
1752	27"	Cottonwood	LM
1753	31"	Cottonwood	LM
1754	12"	Black Willow	Poor
1755	19"	Black Willow	

1756	7"	Mulberry	Inv.
1757	20"	Black Willow	
1758	7"	Ash	Dead
1759	8"	Mulberry	Inv.
1760	8"	Mulberry	Inv.
1761	19"	Cottonwood	
1762	25"	Cottonwood	LM
1763	22"	Black Willow	
1764	18"	Black Willow	
1765	10"	Mulberry	Inv.
1766	18"	Black Willow	Poor
1767	8"	Tree of Heaven	Inv.
1768	9"	Mulberry	Inv.
1769	23"	Cottonwood	
1770	8"	Tree of Heaven	Inv.
1771	36"	Cottonwood	
1772	10"	Mulberry	Inv.
1773	11"	Tree of Heaven	Inv.
1774	27"	Cottonwood	LM
1775	9"	Elm-Rock	
1776	25"	Cottonwood	LM
1777	10"	Mulberry	Inv.
1778	11"	Mulberry	Inv.
1779	30"	Cottonwood	LM
1780	7"	Mulberry	Inv.
1781	11"	Cottonwood	
1782	21"	Cottonwood	
1783	12"	Black Willow	
1784	20"	Black Willow	Poor-top is gone
1785	10" & 10"	Mulberry	Inv.
1786	9"	Mulberry	Inv.
1787	17"	Cottonwood	
1788	8"	Mulberry	Inv.
1789	11"	Mulberry	inv. - bent over
1790	34"	Cottonwood	LM
1791	15"	Mulberry	Inv.
1792	9"	Mulberry	Inv.
1793	12"	Tree of Heaven	Inv.
1794	24"	Cottonwood	LM
1795	22"	Cottonwood	
1796	14"	Elm-Rock	
1797	8"	Mulberry	Inv.
1798	8"	Mulberry	Inv.
1799	13"	Ash	Dead
1800	20"	Black Willow	Leaning
1801	19"	Black Willow	
1802	26"	Cottonwood	LM
1803	29"	Cottonwood	LM
1804	8"	Tree of Heaven	Inv.
1805	10"	Tree of Heaven	Inv.
1806	13"	Mulberry	Poor - Inv.
1807	15"	Black Willow	

1808	26"	Black Willow	LM
1809	20"	Black Willow	
1810	22"	Black Willow	
1811	13"	Mulberry	Inv.
1812	30"	Black Willow	LM
1813	N/A	Lost this tag	
1814	10"	Mulberry	LM
1815	27"	Black Willow	LM
1816	11"	Mulberry	Inv.
1817	20"+20"	Ash	Dead
1818	10"	Ash	Dead
1819	14"	Ash	Dead
1820	16"	Ash	Dead
1821	11"	Black Cherry	
1822	14"	Ash	Dead
1823	22"	Black Willow	
1824	9"	Mulberry	Inv,
1825	11"	Ash	Dead
1826	11"	Ash	Dead
1827	11"	Ash	Dead
1828	11"	Ash	Dead
1829	11"	Ash	Dead
1830	9"	Ash	Dead
1831	16"	Black Willow	
1832	21"	Black Willow	
1833	20"	Black Willow	
1834	20"	Black Willow	
1835	9"	Tree of Heaven	Inv.
1836	9"	Elm-Rock	
1837	14"	Ash	Dead
1838	20"	Ash	Dead
1839	8"	Ash	Dead
1840	7"	Ash	Dead
1841	8"	Mulberry	Inv.
1842	9"	Tree of Heaven	Inv.-Dead
1843	7"	Mulberry	Inv.
1844	9"	Ash	Dead
1845	12"	Mulberry	Inv.
1846	18"	Ash	Dead
1847	15"	Ash	Dead
1848	13"	Mulberry	Inv.
1849	16"	Black Willow	Leaning in River - tag on root
1850	7"	Mulberry	Inv.
1851	18"	Black Willow	
1852	18"	Black Willow	
1853	11"	Ash	Dead
1854	13"	Ash	Dead
1855	15"	Ash	Dead
1856	15"	Ash	Dead
1857	9"	Mulberry	Inv.
1858	16"	Ash	Dead
1859	8" + 6"	Mulberry	Inv.

1860	10"	Mulberry	Inv.
1861	18"	Black Willow	
1862	20"	Cottonwood	
1863	14"	Ash	Dead
1864	10"	Mulberry	Inv.
1865	13"	Ash	Dead
1866	15"	Ash	Dead
1867	12"	Ash	Dead
1868	8"	Ash	Dead
1869	15"	Ash	Dead
1870	14"	Mulberry	Inv.
1871	7"+12"	Ash	Dead
1872	10"	Sugar Maple	
1873	16"+11"	Ash	Dead
1874	18"	Ash	Dead
1875	10"	Ash	Dead
1876	16"	Sugar Maple	LM
1877	17"	Cottonwood	
1878	19"	Cottonwood	
1879	24"+20"+16"	Cottonwood	LM
1880	9"	Elm-Rock	Dead
1881	18"	Ash	Dead
1882	15"	Ash	dead - top down
1883	11"	Elm-Rock	
1884	18"	Ash	Dead
1885	7"	Ash	Dead
1886	7"	Mulberry	Inv.-Dead
1887	24"	Cottonwood	LM
1888	15"	Ash	Dead
1889	13"	Ash	Dead
1890	10"	weeping willow	
1891	21"	Cottonwood	
1892	11"	Ash	Dead
1893	19"	weeping willow	
1894	7"+12"	Ash	Dead
1895	15"	Sugar Maple	
1896	9"+5"	box Elder	
1897	10"	box Elder	
1898	7"	Mulberry	Inv.
1899	11"	Tree of Heaven	Inv.
1900	12"	Mulberry	Inv.
1901	14"	Tree of Heaven	Inv.
1902	8"	Mulberry	Inv.
1903	12"	Tree of Heaven	Inv.
1904	12"+7"	Tree of Heaven	Inv.
1905	23"	black Locust	Inv.
1906	11"	Elm-Rock	
1907	7"	Tree of Heaven	Inv.
1908	8"	Elm-Rock	
1909	7"	Tree of Heaven	Inv.
1910	9"	Mulberry	Inv.
1911	12"	Ash	Dead

1912	26"	black Locust	Inv.
1913	9"	Ash	Dead
1914	9"	Elm-Rock	
1915	12"	Tree of Heaven	Inv.
1916	10"	Tree of Heaven	Top Broken
1917	14"	black Locust	Inv.
1918	8"	black Locust	Inv.
1919	7"	Black Cherry	
1920	10"	Tree of Heaven	Inv.
1921	8"+7"	Mulberry	Inv.
1922	7"	Elm-Rock	
1923	21"	black Locust	Inv.
1924	12"	Mulberry	Inv.
1925	8"	Tree of Heaven	Inv.
1926	9"	Black Cherry	
1927	10"	Tree of Heaven	Inv.
1928	8"	Tree of Heaven	Inv.
1929	11"	Tree of Heaven	Inv.
1930	17"	Tree of Heaven	Inv.
1931	12"	Tree of Heaven	Inv.
1932	14"+8"	Tree of Heaven	Inv.
1933	8"+4"	Mulberry	Inv.
1934	8"	Tree of Heaven	Inv.
1935	7"	Elm-Rock	
1936	10"+6"	Elm-Rock	
1937	19"	Black Cherry	LM
1938	7"	Tree of Heaven	Inv.
1939	7"	Elm-Rock	
1940	8"	Mulberry	Inv.
1941	11"	Tree of Heaven	Inv.
1942		Lost this tag	
1943	12"	Tree of Heaven	Inv.
1944	9"	Tree of Heaven	Inv.
1945	10"	Tree of Heaven	Inv.
1946	13"	Mulberry	Inv.
1947	8"	Mulberry	Inv.-poor
1948	8"	Tree of Heaven	Inv.
1949	8"	Black Cherry	
1950	12"	Sugar Maple	
1951	10"	Tree of Heaven	Inv.
1952	11"	Sugar Maple	
1953	11"	Tree of Heaven	Inv.
1954	8"	Tree of Heaven	Inv.
1955	10"	Elm	
1956	16"+4"	Tree of Heaven	Inv.
1957	7"	Black Cherry	
1958	7"	Sugar Maple	
1959	17"	Tree of Heaven	Inv.
1960	12"	Mulberry	Inv.
1961	9"	Tree of Heaven	Inv.
1962	14"	Mulberry	Inv.
1963	15"	Mulberry	Inv.

1964	14"	Mulberry	Inv.
1965	17"	Mulberry	Inv.
1966	12"	Black Cherry	
1967	14"	Ash	Dead-leaning
1968	13"	Black Cherry	
1969	12"+19"	Ash	Dead
1970	17"	Sugar Maple	LM
1971	17"+13"	Ash	Dead
1972	5"+12"	Mulberry	Inv.
1973	9"	Mulberry	Inv.
1974	19"	Mulberry	Inv.
1975	13"	Mulberry	Inv.
1976	14"	black walnut	
1977	11"	Black Cherry	
1978	12"	Mulberry	Inv.
1979	26"	Ash	Dead
1980	14"	Ash	Dead
1981	10"	Mulberry	Inv.Poor
1982	12"	black walnut	
1983	17"	black walnut	
1984	23"	Mulberry	Inv.
1985	10"+8"	Mulberry	Inv.
1986	16"	Mulberry	Inv.
1987	10"	Tree of Heaven	Inv.
1988	11"	Mulberry	Inv.
1989	12"	Tree of Heaven	Inv.
1990	9"+10"	Tree of Heaven	Inv.
1991	12"	Tree of Heaven	Inv.
1992	10"	Tree of Heaven	Inv.
1993	9"	Mulberry	Inv.
1994	9"+14"	Ash	Dead
1995	14"	Ash	Dead
1996	20"	Ash	Dead
1997	10"	Tree of Heaven	
1998	8"	Mulberry	
1999	9"	Mulberry	
2000	13"	Ash	Dead
2001	17"	Ash	Dead
2002	10"	Black Cherry	
2003	9"	Tree of Heaven	
2004	9"	Mulberry	
2005	8"	Mulberry	
2006	8"	Tree of Heaven	Dead
2007	7"+11"	Tree of Heaven	Dead
2008	8"	Mulberry	
2009	10"	Tree of Heaven	
2010	9"	Tree of Heaven	
2011	9"	Tree of Heaven	
2012	10"	Tree of Heaven	
2013	8"	Tree of Heaven	
2014	14"	Ash	Dead
2015	10"	Ash	Dead

2016	12"	Ash	Dead
2017	16"	Ash	Dead
2018	13"	Mulberry	

APPENDIX
Argo Dam Embankment Soil Borings



Drilling and Sampling Symbols

SS	-	Split-Spoon 1-3/8" I.D., 2" O.D. except where noted	NR	-	No Recovery
LS	-	Liner Sample	RC	-	Rock Core with diamond bit. NQ size, except where noted
AS	-	Power Auger Sample	RB	-	Rock Bit
2ST	-	Shelby Tube – 2" O.D.	VS	-	Vane Shear
3ST	-	Shelby Tube – 3" O.D.	PM	-	Pressuremeter
PS	-	Piston Sample – 3" diameter	WOH	-	Weight of Hammer
WS	-	Wash Sample			
HA	-	Hand Auger Sample	SP	-	Soil Probe
BS	-	Bag or Bottle Sample	PID	-	Photo Ionization Device
CS	-	Continuous Sample	FID	-	Flame Ionization Device

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

Particle Sizes

Boulders	-	Greater than 12 inches (305 mm)
Cobbles	-	3 inches (76.2 mm) to 12 inches (305 mm)
Gravel-Coarse	-	3/4 inches (19.05 mm) to 3 inches (76.2mm)
Fine	-	No. 4 (4.75 mm) to 3/4 inches (19.05 mm)
Sand- Coarse	-	No. 10 (2.00 mm) to No. 4 (4.75 mm)
Medium	-	No. 40 (0.425 mm) to No. 10 (2.00 mm)
Fine	-	No. 200 (0.074 mm) to No. 40 (0.425 mm)
Silt	-	0.005 mm to 0.074 mm
Clay	-	Less than (0.005 mm)

Depositional Features

Parting	-	as much as 1/16 inch (1.6 mm) thick
Seam	-	1/16 inch (1.6 mm) to 1/2 inch (12.7 mm) thick
Layer	-	1/2 inch (12.7 mm) to 12 (305 mm) inches thick
Stratum	-	greater than 12 inches (305 mm) thick
Pocket	-	small, erratic deposit of limited lateral extent
Lens	-	lenticular deposit
Varved	-	alternating seams or layers of silt and/or clay and sometimes fine sand
Occasional	-	one or less per foot (305 mm) of thickness
Frequent	-	more than one per foot (305 mm) of thickness
Interbedded	-	applied to strata of soil or beds of rock lying between or alternating with other strata of a different nature

Groundwater levels indicated on the boring log are the levels measured in the boring at the times indicated. The accurate determination of groundwater levels may not be possible with short term observations, especially in low permeability soils. The groundwater levels shown may fluctuate throughout the year with variation in precipitation, evaporation and runoff.

Classification

Cohesionless Soils (Blows per foot or 0.3 m)

Very Loose	:	0 to 4
Loose	:	5 to 9
Medium Dense	:	10 to 29
Dense	:	30 to 49
Very Dense	:	50 to 80
Extremely Dense	:	Over 80

Soil Constituents

Trace	:	Less than 5%
Trace to Some	:	5% to 12%
Some	:	12% to 25%
Use Descriptor	:	25% to 50%
(i.e., Silty, Clayey, etc.)		

Cohesive Soils

		<u>Consistency</u>	<u>Shear Strength</u>
Very Soft	:	0.25 kips/ft ² (12.0 kPa) or less	
Soft	:	0.25 to 0.49 kips/ft ² (12.0 to 23.8 kPa)	
Medium	:	0.50 to 0.99 kips/ft ² (23.9 to 47.7 kPa)	
Stiff	:	1.00 to 1.99 kips/ft ² (47.8 to 95.6 kPa)	
Very Stiff	:	2.00 to 3.99 kips/ft ² (95.7 to 191.3 kPa)	
Hard	:	4.00 kips/ft ² (191.4 kPa) or greater	

Soil description

If clay content sufficiently dominates soil properties, then clay becomes the primary noun with the other major soil constituent as modifier: i.e. silty clay. Other minor soil constituents may be added according to estimates of soil constituents present, i.e., silty clay, trace to some sand, trace gravel.



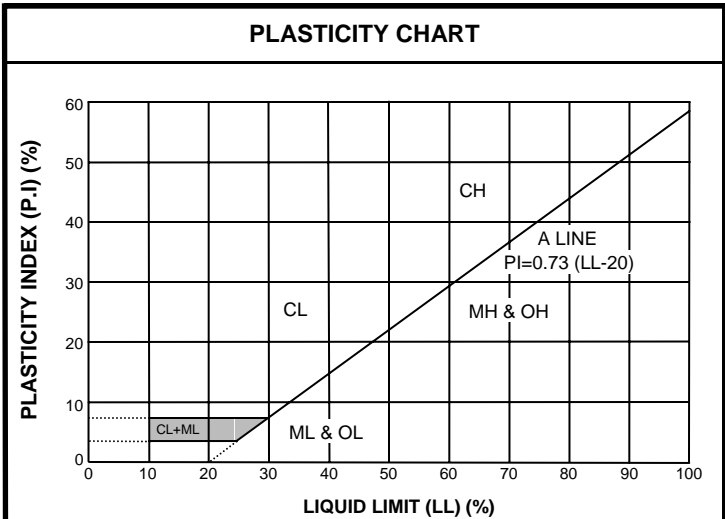
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
		GW Well-graded gravels; sandy gravels, little or no fines
		GP Poorly-graded gravels; sandy gravels, little or no fines
	Gravels with fines (More than 12% fines)	
		GM Silty gravels, some sand or sandy gravels, some silt
		GC Clayey gravels, some sand or sandy gravels, some silt
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
		SW Well-graded sands, gravelly sands, little or no fines
		SP Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
		SM Silty sands or sands, some silt
		SC Clayey sands or sands, some clay
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size)		
SILTS AND CLAYS Liquid limit less than 50%		ML Inorganic silty silts or clayey silts with slight plasticity
		CL Inorganic clays of low plasticity, sandy clays, silty clays
		OL Organic silts and organic clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH Inorganic silts of high plasticity
		CH Inorganic clays of high plasticity
		OH Organic silts and organic clays of high plasticity
HIGHLY ORGANIC SOILS		PT Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA		
GW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

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

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

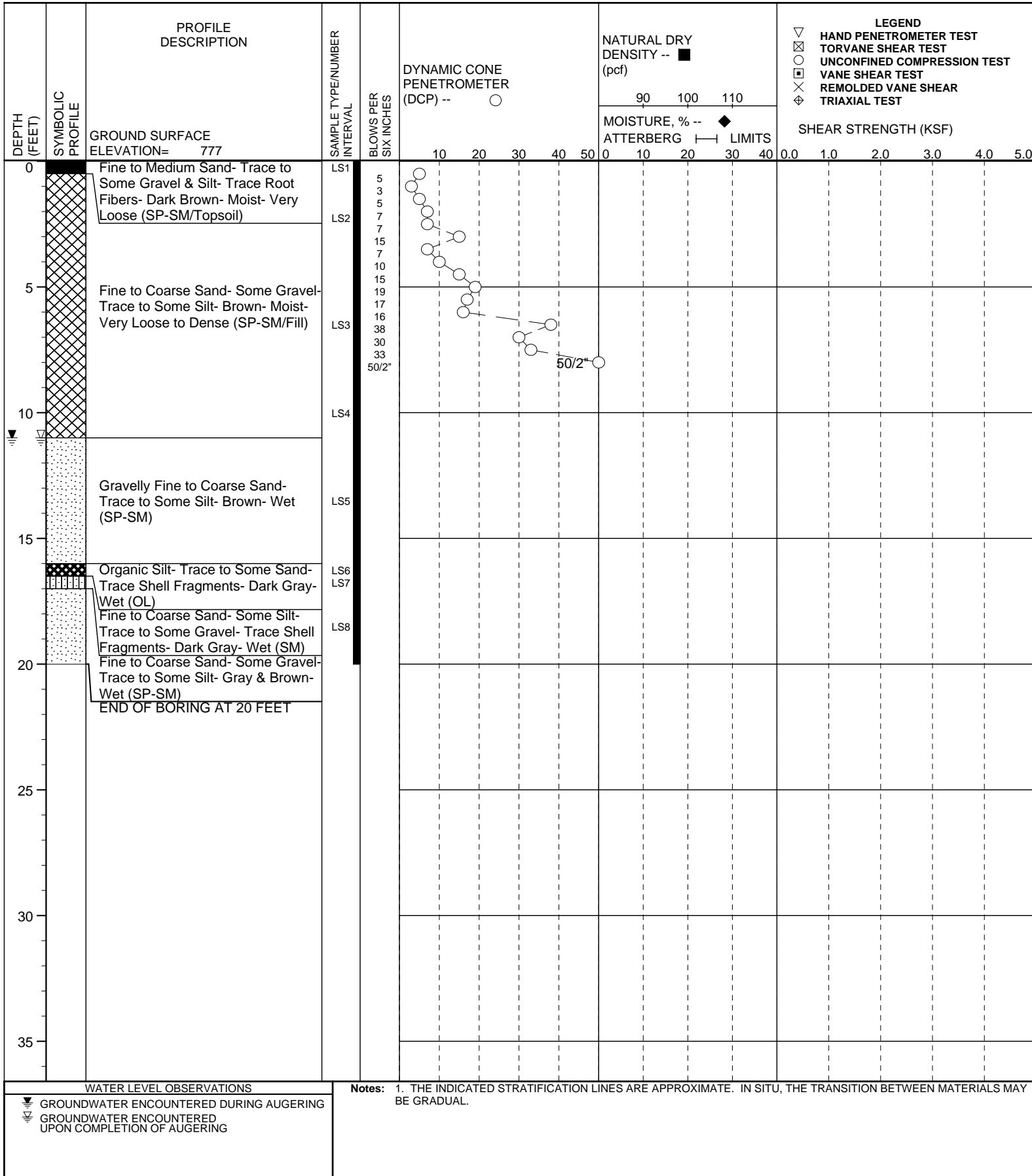




soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: SB/CGN DATE: 9/17/09 BORING B1
 PROJECT NUMBER: PG60424 SHEET: 1



WATER LEVEL OBSERVATIONS
 ▽ GROUNDWATER ENCOUNTERED DURING AUGERING
 ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF AUGERING

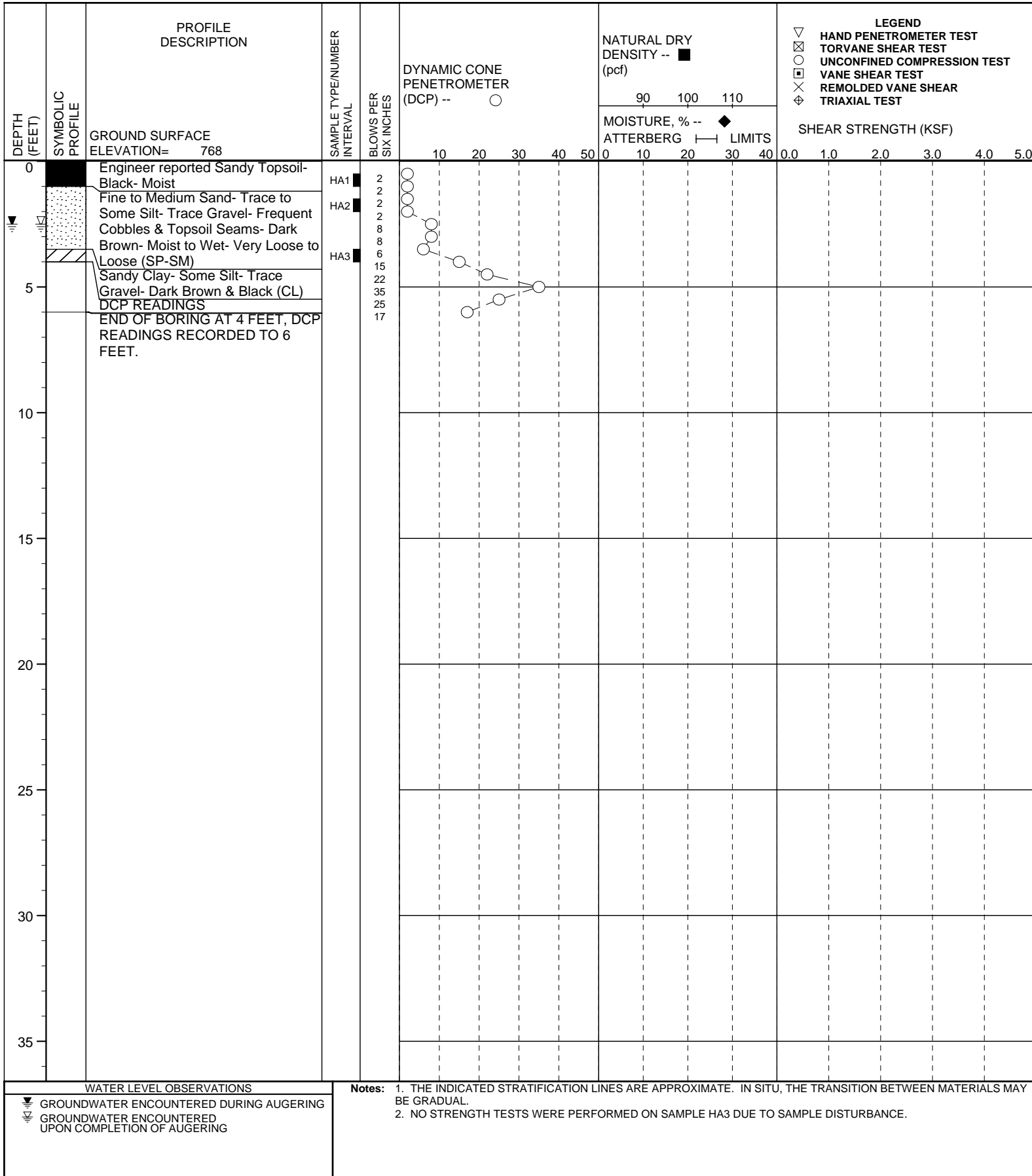
Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.



soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
BY: CGN **DATE:** 9/17/09 **BORING B2**
PROJECT NUMBER: PG60424 **SHEET: 1**

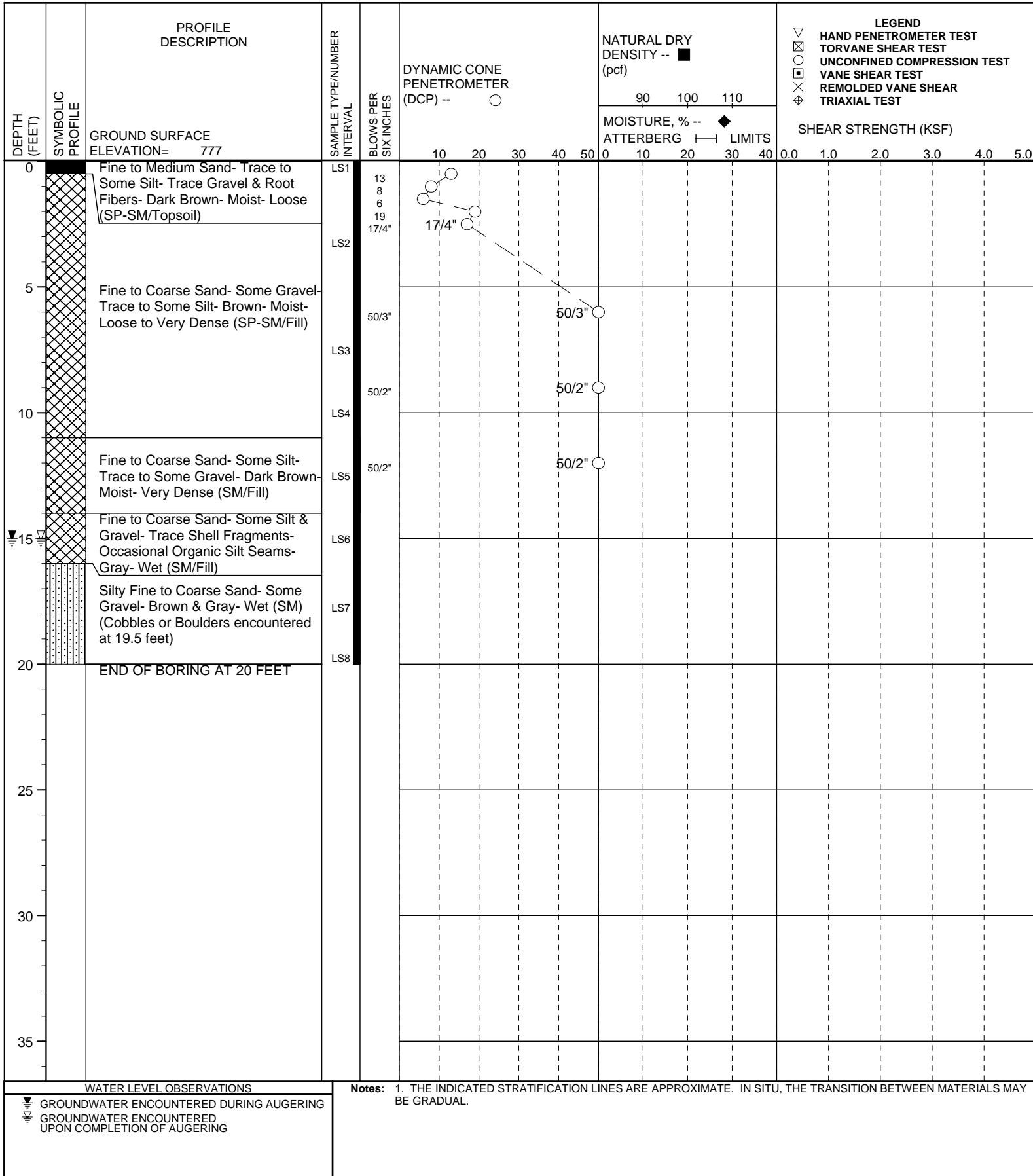




soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: SB/CGN DATE: 9/17/09
 PROJECT NUMBER: PG60424
 BORING B4
 SHEET: 1



WATER LEVEL OBSERVATIONS
 ▽ GROUNDWATER ENCOUNTERED DURING AUGERING
 ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF AUGERING

Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.



soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: CGN DATE: 9/17/09 BORING B5
 PROJECT NUMBER: PG60424 SHEET: 1

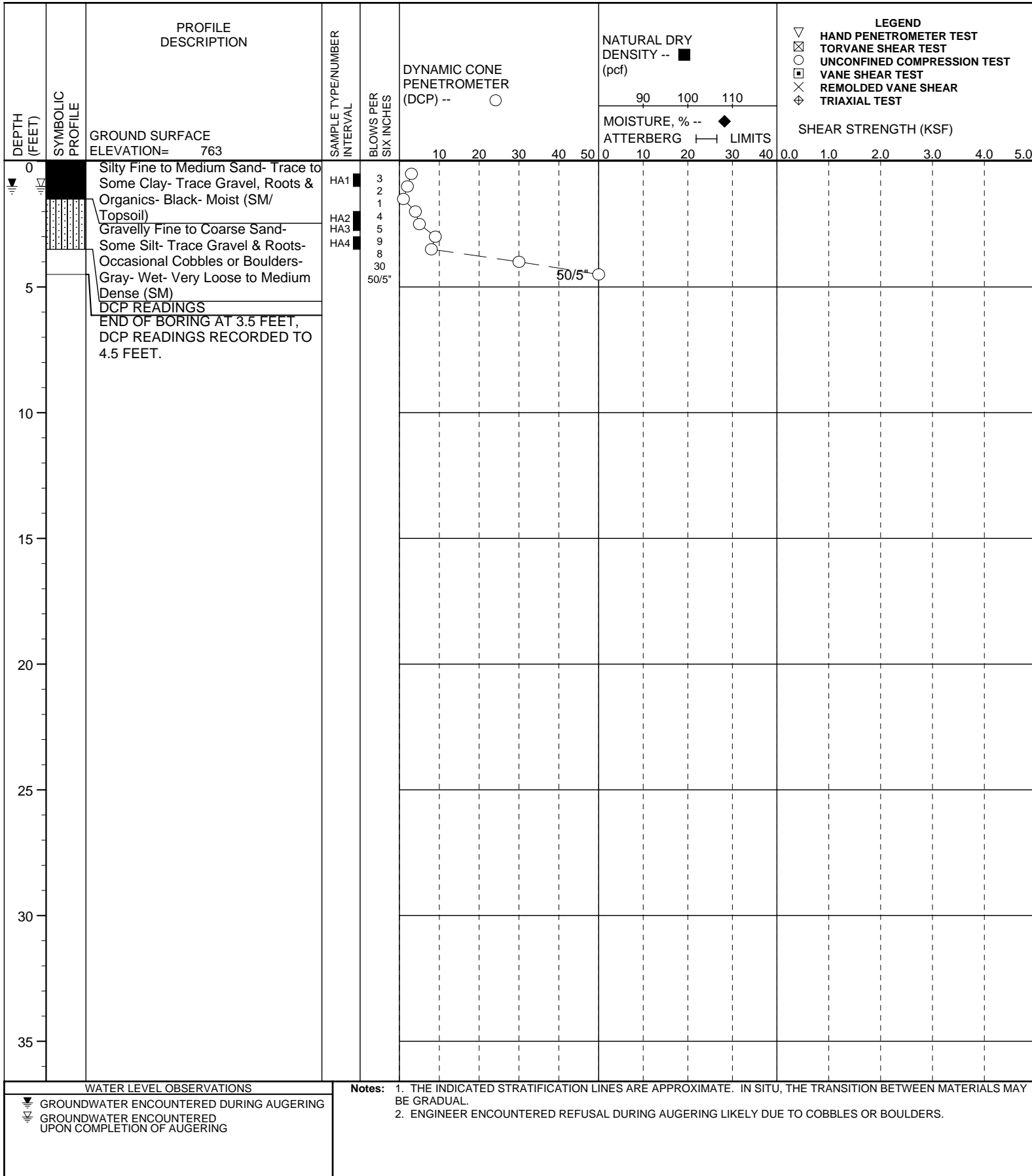
DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) -- ○	NATURAL DRY DENSITY -- ■ (pcf)	MOISTURE, % -- ◆	ATTERBERG LIMITS	LEGEND											
						90 100 110			0.0 1.0 2.0 3.0 4.0 5.0	▽	⊠	○	□	×	⊕					
0		GROUND SURFACE ELEVATION= 768																		
0 - 3		Engineer reported Sandy Topsoil- Black- Moist Engineer reported Fine to Coarse Sand- Trace to Some Silt- Frequent Cobbles or Boulders- Trace Gravel- Brown- Moist- Loose to Medium Dense (SP-SM/Fill) END OF BORING AT 3 FEET		5 12 17 22 28/4"																
5																				
10																				
15																				
20																				
25																				
30																				
35																				
WATER LEVEL OBSERVATIONS ▽ GROUNDWATER ENCOUNTERED DURING AUGERING ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF AUGERING			Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. GROUNDWATER WAS NOT ENCOUNTERED. 3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED TWO MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.																	



soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: CGN DATE: 9/17/09 BORING B6
 PROJECT NUMBER: PG60424 SHEET: 1

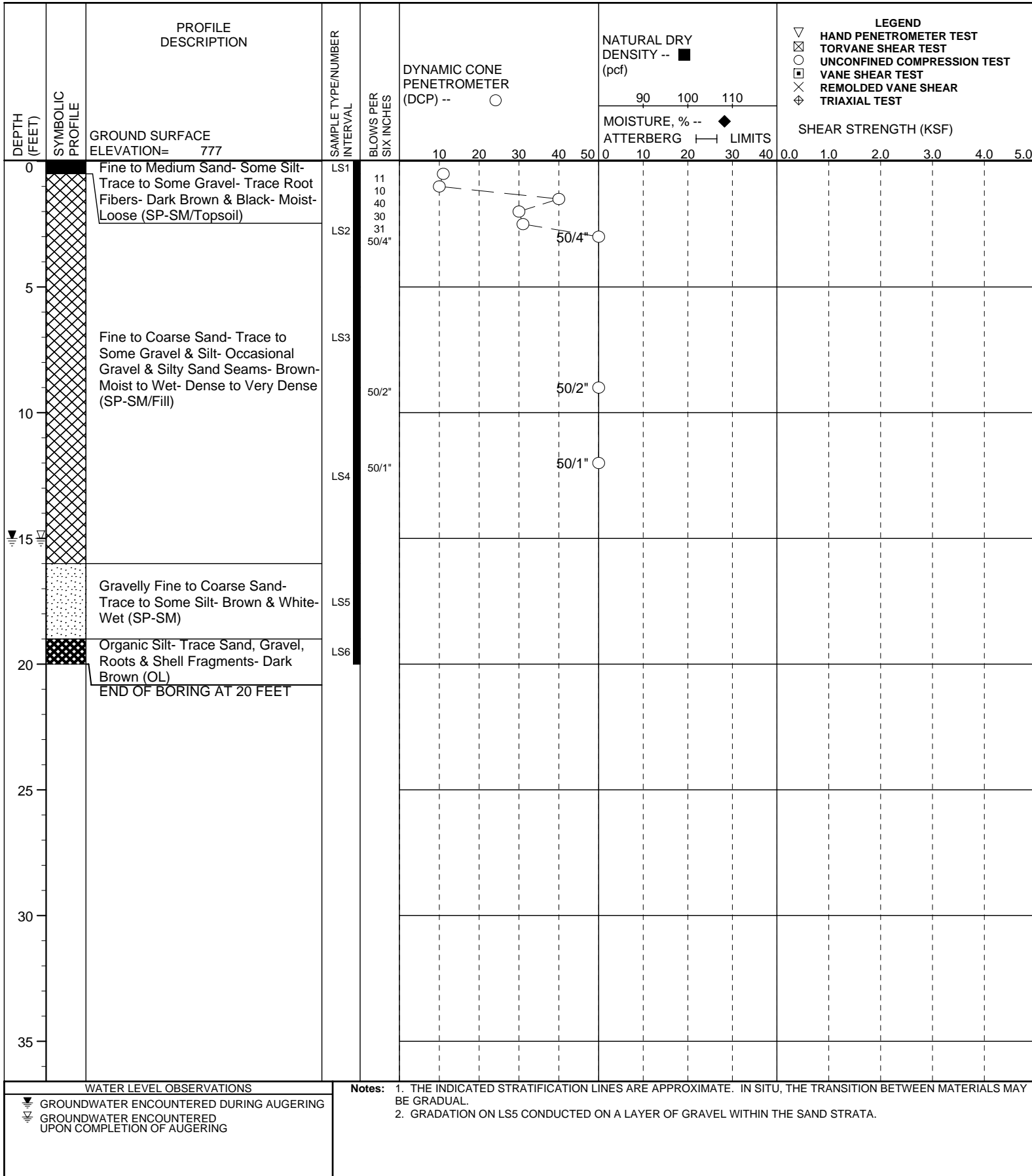




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PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: SB/CGN DATE: 9/17/09
 PROJECT NUMBER: PG60424
 BORING B7
 SHEET: 1





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PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
 BY: CGN DATE: 9/17/09 BORING B8
 PROJECT NUMBER: PG60424 SHEET: 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) -- ○	NATURAL DRY DENSITY -- ■ (pcf)		MOISTURE, % -- ◆	ATTERBERG LIMITS	LEGEND										
						90	100			110	▽	⊠	○	□	×	◇				
0		GROUND SURFACE ELEVATION= 768								SHEAR STRENGTH (KSF)										
0 - 4	⊠	Fine to Medium Sand- Some Silt- Trace to Some Gravel- Trace Organics- Frequent Cobbles & Roots- Black- Moist- Loose to Medium Dense (SM/Topsoil/Fill)	HA1 HA2	10 11 16 20 24 24	○															
4 - 6	⊠	Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Frequent Cobbles or Boulders- Brown- Moist- Medium Dense to Dense (SP-SM/Fill)	HA3	48 50 25 17 19 20	○															
6 - 35		DCP READINGS END OF BORING AT 4 FEET, DCP READINGS RECORDED TO 6 FEET.																		

WATER LEVEL OBSERVATIONS
 ▽ GROUNDWATER ENCOUNTERED DURING AUGERING
 ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF AUGERING

Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
 2. GROUNDWATER WAS NOT ENCOUNTERED.
 3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED TWO MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.



soil and materials engineers, inc.

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

A/E: STANTEC MICHIGAN
BY: CGN **DATE:** 9/17/09 **BORING B9**
PROJECT NUMBER: PG60424 **SHEET:** 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	BLOWS PER SIX INCHES	DYNAMIC CONE PENETROMETER (DCP) -- ○	NATURAL DRY DENSITY -- ■ (pcf)	MOISTURE, % -- ◆	ATTERBERG LIMITS	LEGEND					
						90 100 110			0.0 1.0 2.0 3.0 4.0 5.0	▽	⊠	○	□	×
0		GROUND SURFACE ELEVATION= 762							LEGEND ▽ HAND PENETROMETER TEST ⊠ TORVANE SHEAR TEST ○ UNCONFINED COMPRESSION TEST □ VANE SHEAR TEST × REMOLDED VANE SHEAR ⊕ TRIAXIAL TEST SHEAR STRENGTH (KSF)					
0		Engineer reported Sandy Topsoil- Black- Frequent Cobbles- Black-Moist (SM/Topsoil/Fill) DCP READINGS		2 19 14 8 4	○									
0		END OF BORING AT .5 FEET, DCP READINGS RECORDED TO 2.5 FEET.												
5														
10														
15														
20														
25														
30														
35														
WATER LEVEL OBSERVATIONS ▽ GROUNDWATER ENCOUNTERED DURING AUGERING ▽ GROUNDWATER ENCOUNTERED UPON COMPLETION OF AUGERING			Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. GROUNDWATER WAS NOT ENCOUNTERED. 3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED SEVEN MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.											



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: SB/CGN **DATE:** 9/17/09

ELEVATION (FL)	WELL DIAGRAM	DEPTH (FT)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
780				GROUND SURFACE ELEVATION IN FEET MSL= 777	
		0		Fine to Medium Sand- Trace to Some Gravel & Silt- Trace Root Fibers- Dark Brown- Moist- Very Loose (SP-SM/Topsoil)	Top of Casing Elevation: 779.88
775					Well Screen Tip Elevation: 761
		5		Fine to Coarse Sand- Some Gravel- Trace to Some Silt- Brown- Moist- Very Loose to Dense (SP-SM/Fill)	Borehole Diameter: 2.25 inches Filter Pack Type: Natural Sand
770					Well Casing Diameter: 1 inch Length: 14 feet Type: PVC Joint Type:
		10			Well Screen Diameter: 1 inch Length: 5 feet Type: PVC Mesh: Screen Plug (Y/N): Y
765				Gravelly Fine to Coarse Sand- Trace to Some Silt- Brown- Wet (SP-SM)	
		15			Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal
760				Organic Silt- Trace to Some Sand- Trace Shell Fragments- Dark Gray- Wet (OL)	
		20		Fine to Coarse Sand- Some Silt- Trace to Some Gravel- Trace Shell Fragments- Dark Gray- Wet (SM) Fine to Coarse Sand- Some Gravel- Trace to Some Silt- Gray & Brown- Wet (SP-SM) END OF BORING AT 20 FEET	Well Cap Type: 3/4-inch Locking Well Cap
755				Northing: Easting:	
750					
745					

WELL TYPE: OBSERVATION **DRILLING METHODS:** DIRECT PUSH
DRILLER: CGN **GROUNDWATER DURING DRILLING**
RIG NUMBER OR **GROUNDWATER AFTER DRILLING**
CONTRACTOR: GEOPROBE

Notes:
1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. OBSERVATION WELL INSTALLED IN BORING B1.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	9.96	767.04



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: CGN

DATE: 9/17/09

ELEVATION (FL)	WELL DIAGRAM	DEPTH (FL)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
770				GROUND SURFACE ELEVATION IN FEET MSL= 768	Top of Casing Elevation: 772.30
		0	█	Engineer reported Sandy Topsoil- Black- Moist	Well Screen Tip Elevation: 762
765			▨	Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Frequent Cobbles & Topsoil Seams- Dark Brown- Moist to Wet- Very Loose to Loose (SP-SM)	Borehole Diameter: 3.25 inches
			▧	Sandy Clay- Some Silt- Trace Gravel- Dark Brown & Black (CL) END OF BORING AT 4 FEET, OBSERVATION WELL INSTALLED TO A DEPTH OF 6 FEET.	Filter Pack Type: 2NS Sand
760		10			Well Casing Diameter: 2 inches Length: 4 feet Type: PVC Joint Type:
755		15			Well Screen Diameter: 2 inches Length: 5 feet Type: PVC Mesh: Screen Plug (Y/N): Y
750		20			Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal
745		25			Well Cap Type: 3/4-inch Locking Well Cap
740					Northing: Easting:
735		30			

WELL TYPE: OBSERVATION
DRILLER: CGN
RIG NUMBER OR CONTRACTOR: HAND AUGER
DRILLING METHODS: HAND AUGER
GROUNDWATER DURING DRILLING
GROUNDWATER AFTER DRILLING

Notes:
 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
 2. OBSERVATION WELL INSTALLED IN BORING B2.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	5.88	762.12



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: SB/CGN **DATE:** 9/17/09

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
780				GROUND SURFACE ELEVATION IN FEET MSL= 777	Top of Casing Elevation: 780.97
		0		Fine to Medium Sand- Trace to Some Silt- Trace Gravel & Root Fibers- Dark Brown- Moist- Loose (SP-SM/Topsoil)	Well Screen Tip Elevation: 757
775		5		Fine to Coarse Sand- Some Gravel- Trace to Some Silt- Brown- Moist- Loose to Very Dense (SP-SM/Fill)	Borehole Diameter: 2.25 inches Filter Pack Type: Natural Sand
770		10			Well Casing Diameter: 1 inch Length: 18 feet Type: PVC Joint Type:
765		15		Fine to Coarse Sand- Some Silt- Trace to Some Gravel- Dark Brown- Moist- Very Dense (SM/Fill)	Well Screen Diameter: 1 inch Length: 5 feet Type: PVC Mesh:
760		19.5		Fine to Coarse Sand- Some Silt & Gravel- Trace Shell Fragments- Occasional Organic Silt Seams- Gray- Wet (SM/Fill)	Screen Plug (Y/N): Y
755		20		Silty Fine to Coarse Sand- Some Gravel- Brown & Gray- Wet (SM) (Cobbles or Boulders encountered at 19.5 feet)	Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal
				END OF BORING AT 20 FEET	Well Cap Type: 3/4-inch Locking Well Cap
750		25			Northing: Easting:
745		30			

WELL TYPE: OBSERVATION DRILLER: CGN RIG NUMBER OR CONTRACTOR: GEOPROBE		DRILLING METHODS: DIRECT PUSH GROUNDWATER DURING DRILLING GROUNDWATER AFTER DRILLING	
WATER LEVEL DATA			
DATE	DEPTH (Feet)	ELEVATION (Feet)	
9/30/09	19.64	757.36	

Notes:

- THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
- OBSERVATION WELL INSTALLED IN BORING B4.



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: CGN

DATE: 9/17/09

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
770		0	<div style="background-color: black; width: 100px; height: 10px;"></div> Engineer reported Sandy Topsoil- Black- Moist	GROUND SURFACE ELEVATION IN FEET MSL= 768	Top of Casing Elevation: 772.06
765		<div style="background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); width: 100px; height: 10px;"></div> Engineer reported Fine to Coarse Sand- Trace to Some Silt- Frequent Cobbles or Boulders- Trace Gravel- Brown- Moist- Loose to Medium Dense (SP-SM/Fill)	Well Screen Tip Elevation: 758.5		
760		5	END OF BORING AT 3 FEET, OBSERVATION WELL INSTALLED TO A DEPTH OF 9.5 FEET.	Borehole Diameter: Driven Filter Pack Type: None	
755		10		Well Casing Diameter: 1.25 inch Length: 9 feet Type: Galvanized Steel	
750		15		Joint Type:	
745		20		Well Screen Diameter: 1.25 inches Length: 3 feet Type: Stainless Steel Mesh: Screen Plug (Y/N): Y	
740		25		Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal	
735		30		Well Cap Type: 3/4-inch Locking Well Cap	
					Northing: Easting:

WELL TYPE: OBSERVATION
DRILLER: CGN
RIG NUMBER OR CONTRACTOR: HAND AUGER
DRILLING METHODS: HAND AUGER
 GROUNDWATER DURING DRILLING
 GROUNDWATER AFTER DRILLING

Notes:

1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. OBSERVATION WELL INSTALLED NEAR BORING B5.
3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED TWO MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.
4. A 2 INCH DIAMETER 5 FOOT LONG PVC CASING WAS DRIVEN ABOUT 1.5 FEET BELOW THE EXISTING GROUND SURFACE TO PROTECT THE 1.25 INCH GALVANIZED RISER PIPE. THE 1.25 INCH GALVANIZED RISER PIPE HAD A STICK-UP OF ABOUT 2.5 FEET FROM THE EXISTING GROUND SURFACE.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	8.25	759.75



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: CGN

DATE: 9/17/09

ELEVATION (FL)	WELL DIAGRAM	DEPTH (FL)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
765				GROUND SURFACE ELEVATION IN FEET MSL= 763	Top of Casing Elevation: 766.67
		0		Silty Fine to Medium Sand- Trace to Some Clay- Trace Gravel, Roots & Organics- Black- Moist (SM/Topsoil)	Well Screen Tip Elevation: 758
760				Gravelly Fine to Coarse Sand- Some Silt- Trace Gravel & Roots- Occasional Cobbles or Boulders- Gray- Wet- Very Loose to Medium Dense (SM)	Borehole Diameter: 3.25 inches
		5		END OF BORING AT 3.5 FEET, OBSERVATION WELL INSTALLED TO A DEPTH OF 5 FEET.	Filter Pack Type: 2NS Sand
755		10			Well Casing Diameter: 2 inches Length: 3 feet Type: PVC Joint Type:
750		15			Well Screen Diameter: 2 inches Length: 3.5 feet Type: PVC Mesh: Screen Plug (Y/N): Y
745		20			Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal
740		25			Well Cap Type: 3/4-inch Locking Well Cap
735		30			Northing: Easting:
730					

WELL TYPE: OBSERVATION
DRILLER: CGN
RIG NUMBER OR CONTRACTOR: HAND AUGER
DRILLING METHODS: HAND AUGER
GROUNDWATER DURING DRILLING
GROUNDWATER AFTER DRILLING

Notes:
 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
 2. OBSERVATION WELL INSTALLED IN BORING B6.
 3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING LIKELY DUE TO COBBLES OR BOULDERS.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	4.42	758.58

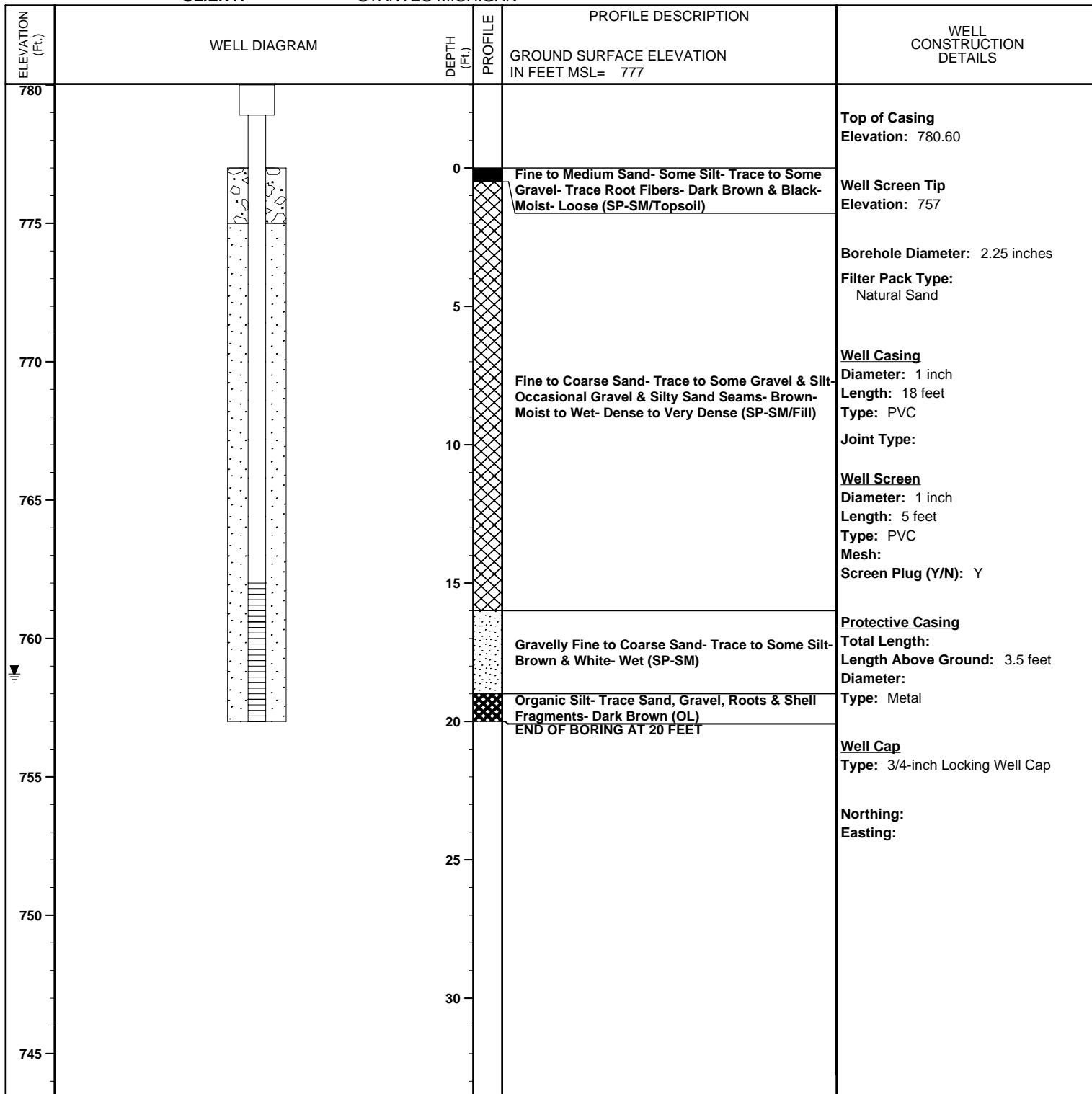


OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
 PROJECT LOCATION: ANN ARBOR, MICHIGAN
 CLIENT: STANTEC MICHIGAN

BY: SB/CGN DATE: 9/17/09



WELL TYPE: OBSERVATION DRILLER: CGN RIG NUMBER OR CONTRACTOR: GEOPROBE		DRILLING METHODS: DIRECT PUSH GROUNDWATER DURING DRILLING GROUNDWATER AFTER DRILLING	
WATER LEVEL DATA			
DATE	DEPTH (Feet)	ELEVATION (Feet)	
9/30/09	18.28	758.72	

Notes:

1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. OBSERVATION WELL INSTALLED IN BORING B7.
3. GRADATION ON LS5 CONDUCTED ON A LAYER OF GRAVEL WITHIN THE SAND STRATA.



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: CGN

DATE: 9/17/09

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS	
				GROUND SURFACE ELEVATION IN FEET MSL= 768		
765		0	<div style="background-color: black; width: 100%; height: 10px;"></div> <div style="background-color: #cccccc; width: 100%; height: 10px;"></div>	<p>Fine to Medium Sand- Some Silt- Trace to Some Gravel- Trace Organics- Frequent Cobbles & Roots- Black- Moist- Loose to Medium Dense (SM/Topsoil/Fill)</p> <p>Fine to Medium Sand- Trace to Some Silt- Trace Gravel- Frequent Cobbles or Boulders- Brown-Moist- Medium Dense to Dense (SP-SM/Fill)</p>	<p>Top of Casing Elevation: 770.0</p> <p>Well Screen Tip Elevation: 757</p>	
760		5		END OF BORING AT 4 FEET, OBSERVATION WELL INSTALLED TO A DEPTH OF 11 FEET.	<p>Borehole Diameter: Driven</p> <p>Filter Pack Type: None</p>	
755		10			<p>Well Casing Diameter: 1.25 inches Length: 9 feet Type: Galvanized Steel</p>	
750		15			<p>Joint Type:</p> <p>Well Screen Diameter: 1.25 inches Length: 3 feet Type: Stainless Steel Mesh: Screen Plug (Y/N): Y</p>	
745		20			<p>Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter: Type: Metal</p>	
740		25			<p>Well Cap Type: 3/4-inch Locking Well Cap</p>	
735		30			<p>Northing: Easting:</p>	
		35				

WELL TYPE: OBSERVATION
DRILLER: CGN
RIG NUMBER OR CONTRACTOR: HAND AUGER

DRILLING METHODS: HAND AUGER
GROUNDWATER DURING DRILLING
GROUNDWATER AFTER DRILLING

Notes:

1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. OBSERVATION WELL INSTALLED NEAR BORING B8.
3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED TWO MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.
4. A 2 INCH DIAMETER 5 FOOT LONG PVC CASING WAS DRIVEN ABOUT 1.5 FEET BELOW THE EXISTING GROUND SURFACE TO PROTECT THE 1.25 INCH GALVANIZED RISER PIPE. THE 1.25 INCH GALVANIZED RISER PIPE HAD A STICK-UP OF ABOUT 2.5 FEET FROM THE EXISTING GROUND SURFACE.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	8.07	759.93



OBSERVATION WELL LOG

SME PROJECT No. PG60424

PROJECT NAME: ARGO DAM
PROJECT LOCATION: ANN ARBOR, MICHIGAN
CLIENT: STANTEC MICHIGAN

BY: CGN

DATE: 9/17/09

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
		0		GROUND SURFACE ELEVATION IN FEET MSL= 762	
760				Engineer reported Sandy Topsoil- Black-Frequent Cobbles- Black- Moist (SM/Topsoil/Fill)	Top of Casing Elevation: 765.35
		5		END OF BORING AT .5 FEET, OBSERVATION WELL INSTALLED TO A DEPTH OF 6 FEET.	Well Screen Tip Elevation: 756
755					Borehole Diameter: Driven
					Filter Pack Type: None
750					Well Casing Diameter: 1.25 inches Length: 3 feet Type: Galvanized Steel
					Joint Type:
745					Well Screen Diameter: 1.25 inches Length: 3 feet Type: Stainless Steel Mesh:
					Screen Plug (Y/N): Y
740					Protective Casing Total Length: Length Above Ground: 3.5 feet Diameter:
					Type: Metal
735				Well Cap Type: 3/4-inch Locking Well Cap	
730				Northing: Easting:	
		35			

WELL TYPE: OBSERVATION
DRILLER: CGN
RIG NUMBER OR CONTRACTOR: HAND AUGER

DRILLING METHODS: HAND AUGER
GROUNDWATER DURING DRILLING
GROUNDWATER AFTER DRILLING

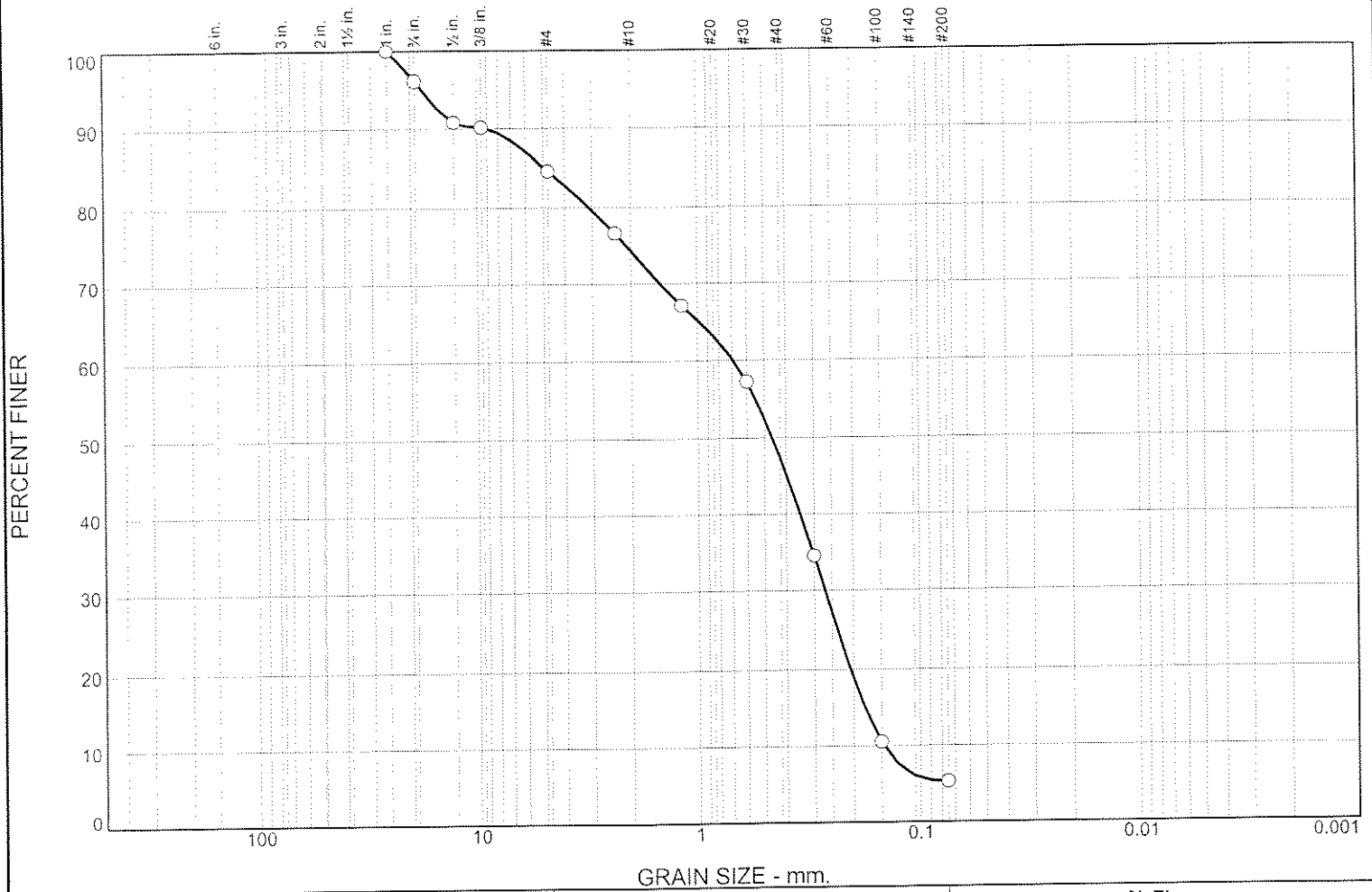
Notes:

1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. OBSERVATION WELL INSTALLED NEAR BORING B9.
3. ENGINEER ENCOUNTERED REFUSAL DURING AUGERING, OFFSET & RE-AUGERED SEVEN MORE TIMES & MET REFUSAL, LIKELY DUE TO COBBLES OR BOULDERS.
4. A 2 INCH DIAMETER 5 FOOT LONG PVC CASING WAS DRIVEN ABOUT 1.5 FEET BELOW THE EXISTING GROUND SURFACE TO PROTECT THE 1.25 INCH GALVANIZED RISER PIPE. THE 1.25 INCH GALVANIZED RISER PIPE HAD A STICK-UP OF ABOUT 0.08 FEET FROM THE EXISTING GROUND SURFACE.

WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
9/30/09	5.34	756.66

Particle Size Distribution Report



GRAIN SIZE - mm.

	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	3.8	11.5	10.3	27.0	42.1	5.3			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			4.8956	0.6901	0.4608	0.2683	0.1779	0.1462	0.71	4.72

Material Description

○ Fine to Coarse Sand, Some Gravel, Trace to Some Silt

USCS

SP-SM

AASHTO

Project No. PG60424 Client: Stantec Michigan
 Project: Argo Dam Toe Drain Evaluation
 Ann Arbor, MI

Remarks:

○ Boring: B1
 Sample: LS3

Soil and Materials Engineers, Inc.

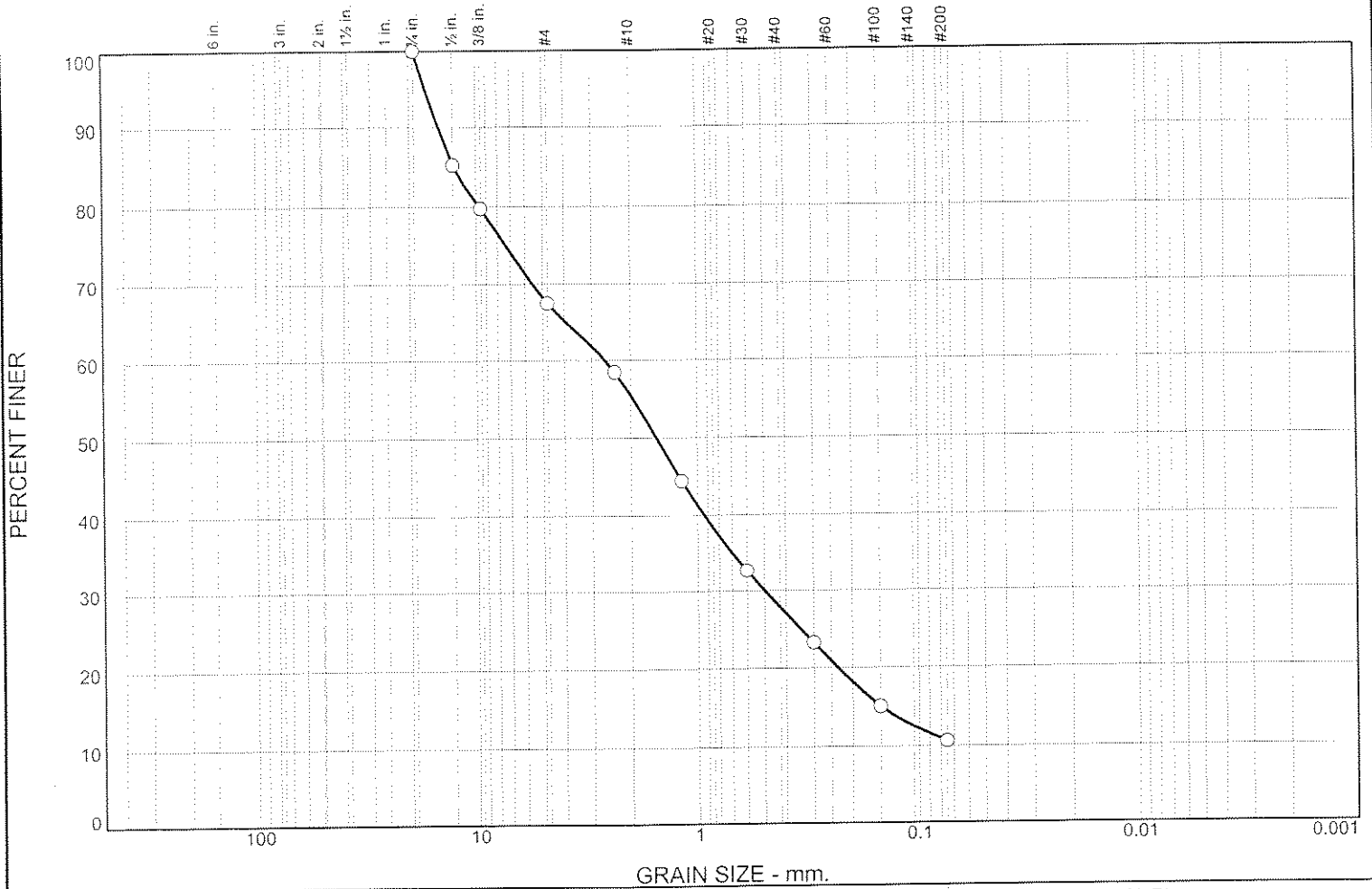
Plymouth, MI

Figure 1

Tested By: Kanti Patel

Checked By: Jason Cumbers

Particle Size Distribution Report



		GRAIN SIZE - mm.								
	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
<input type="radio"/>	0.0	0.0	32.5	11.9	27.8	17.1	10.7			
<input checked="" type="checkbox"/>	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
<input type="radio"/>			12.5578	2.6083	1.5304	0.4981	0.1476			

Material Description	USCS	AASHTO
<input type="radio"/> Gravelly Fine to Coarse Sand, Trace to Some Silt	SP-SM	

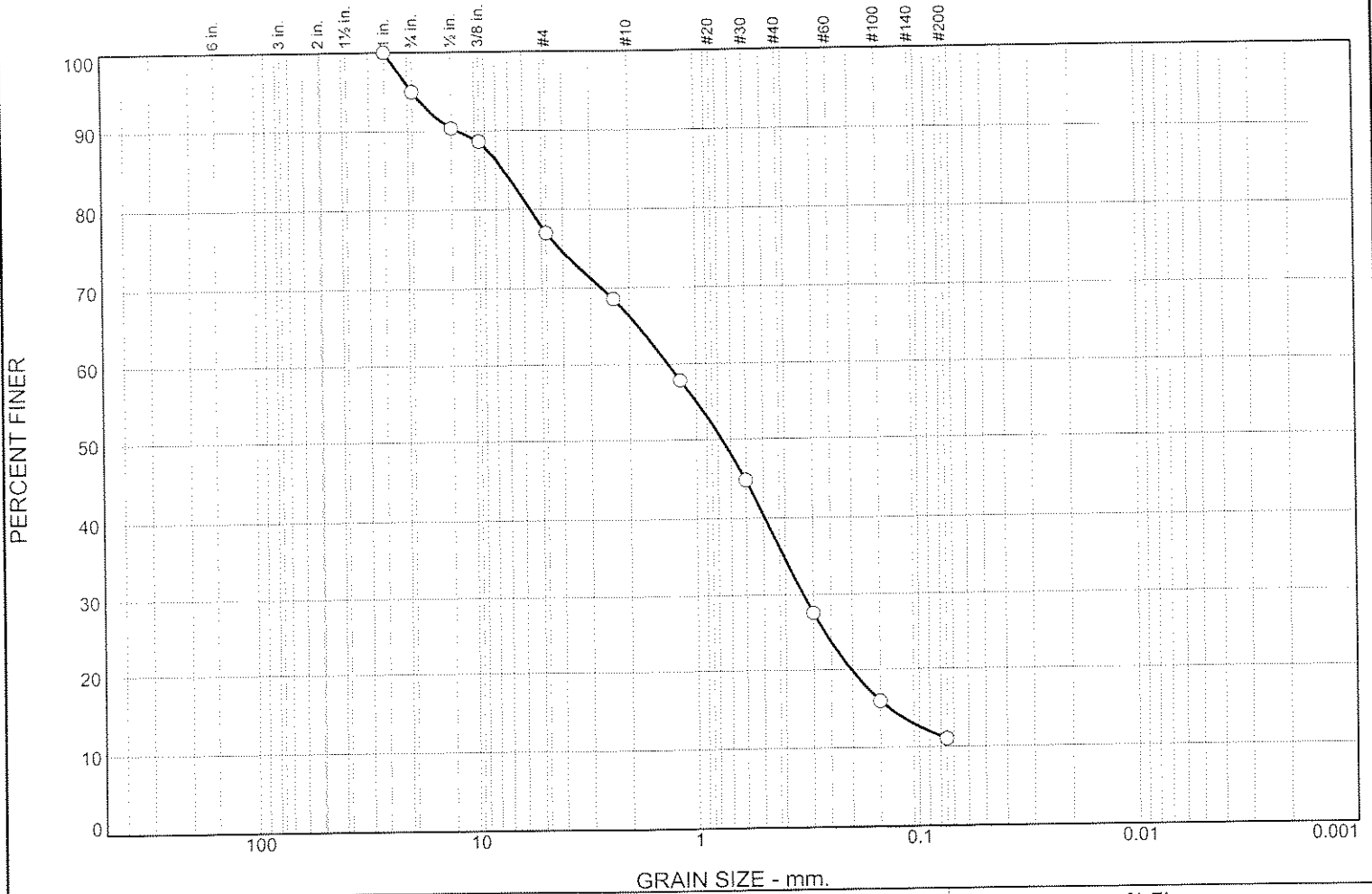
Project No. PG60424 **Client:** Stantec Michigan
Project: Argo Dam Toe Drain Evaluation
 Ann Arbor, MI

Soil and Materials Engineers, Inc.
Plymouth, MI

Remarks:
 Botring: B1
 Sample: LS5

Figure 2

Particle Size Distribution Report



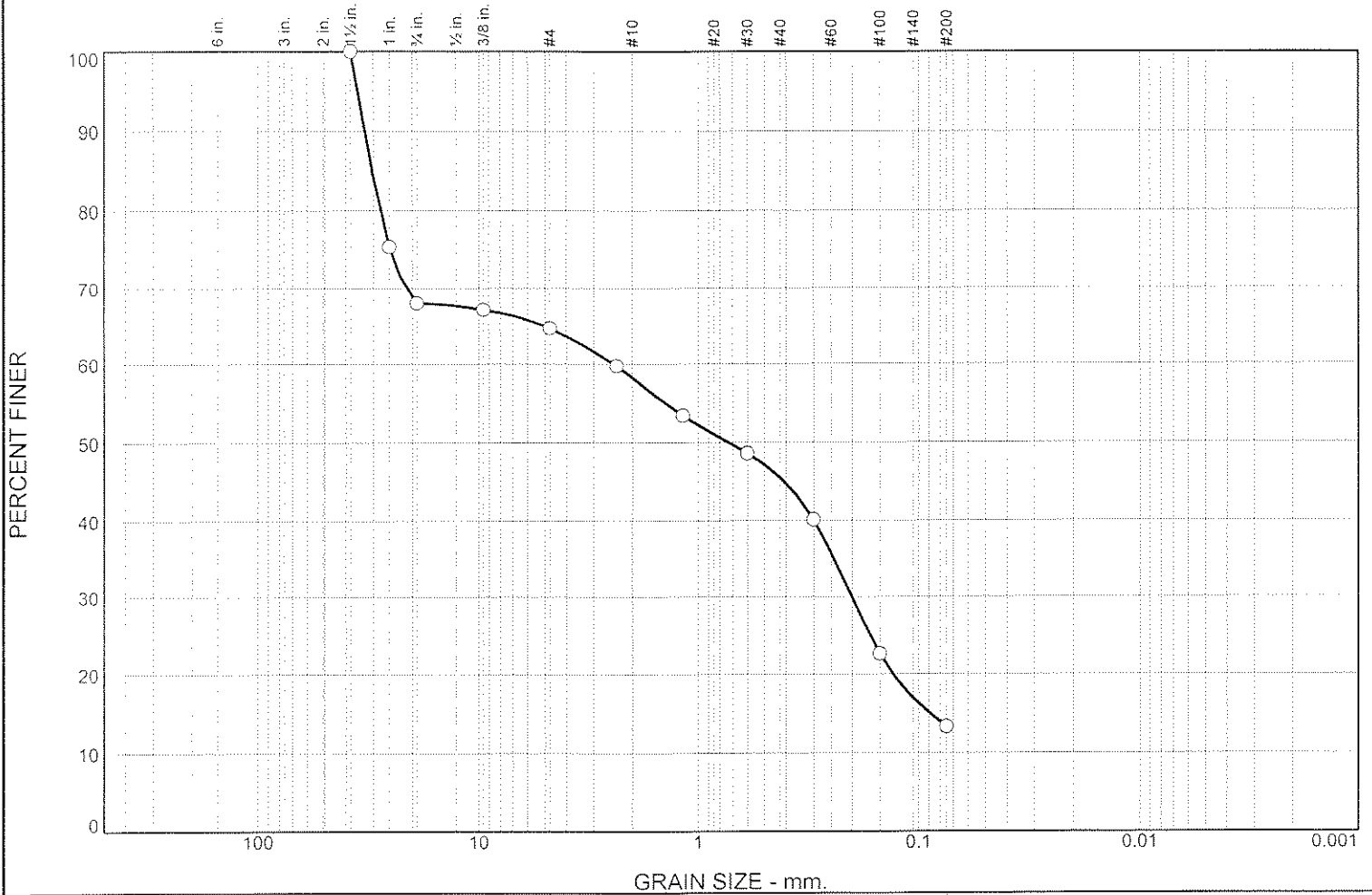
% +3"		% Gravel		% Sand			% Fines		Clay		
		Coarse	Fine	Coarse	Medium	Fine	Silt				
○ 0.0		5.0	18.0	10.7	30.1	25.2	11.0				
X LL		PL		D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
				7.3256	1.3428	0.7681	0.3325	0.1379			

Material Description	USCS	AASHTO
○ Fine to Coarse Sand, Some Gravel, Trace to Some Silt	SP-SM	

<p>Project No. PG60424 Client: Stantec Michigan</p> <p>Project: Argo Dam Toe Drain Evaluation</p> <p>Ann Arbor, MI</p> <p>○</p>	<p>Remarks:</p> <p>○ Boring: B4</p> <p>Sample: LS3</p>
<p>Soil and Materials Engineers, Inc.</p> <p>Plymouth, MI</p>	

Figure 3

Particle Size Distribution Report



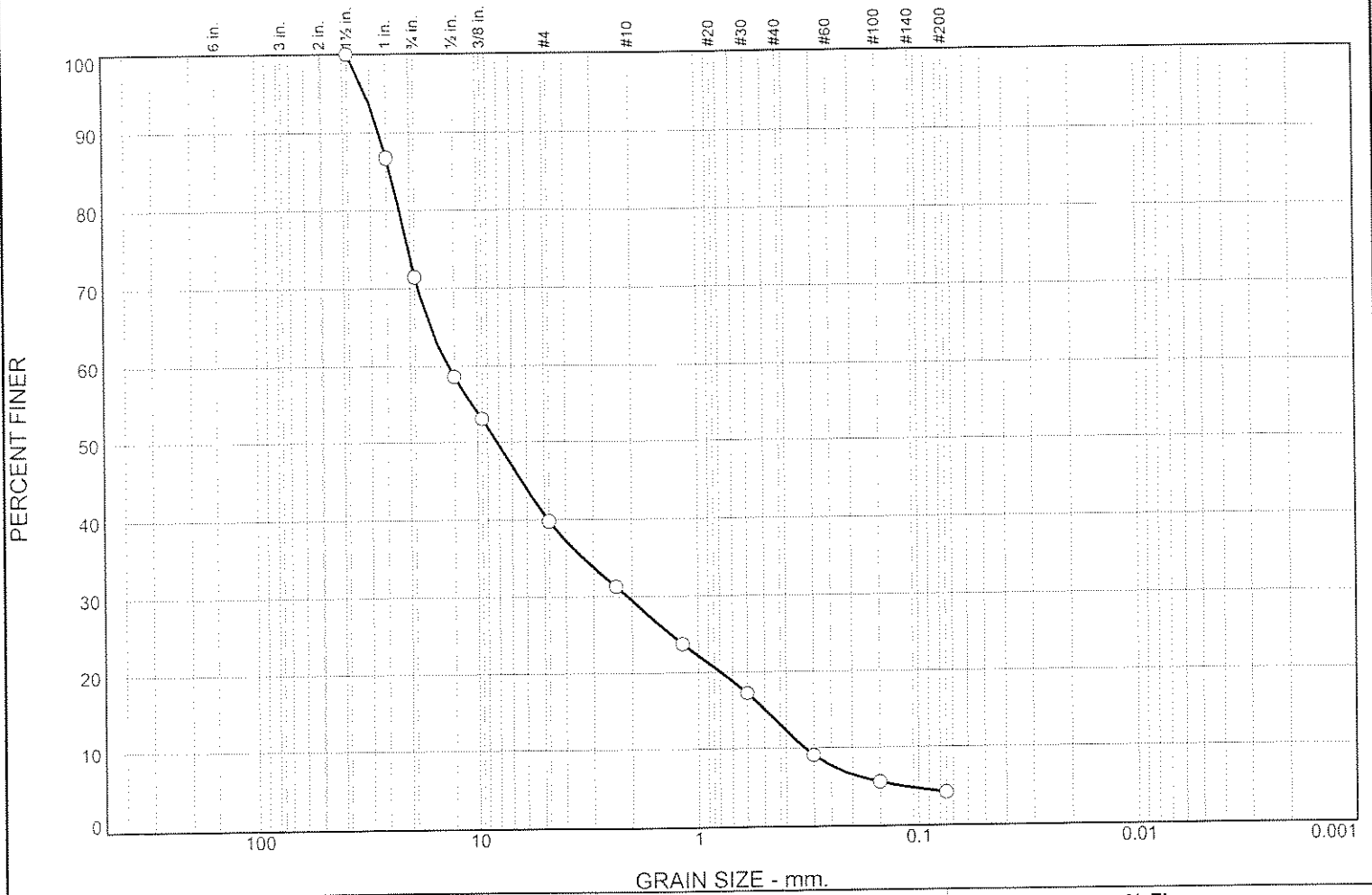
		GRAIN SIZE - mm.						% Fines			
		% +3"	% Gravel		% Sand			Silt	Clay		
			Coarse	Fine	Coarse	Medium	Fine				
○		0.0	31.9	3.3	6.6	12.6	32.2	13.4			
⊗		LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○				30.4683	2.4362	0.7300	0.2015	0.0890			

Material Description	USCS	AASHTO
○ Gravelly Fine to Coarse Sand, Some Silt	SM	

<p>Project No. PG60424 Client: Stantec Michigan</p> <p>Project: Argo Dam Toe Drain Evaluation</p> <p>Ann Arbor, MI</p> <p>○</p>	<p>Remarks:</p> <p>○ Boring: B6</p> <p> Samples: HA3 & HA4</p>
<p>Soil and Materials Engineers, Inc.</p> <p>Plymouth, MI</p>	

Figure 4

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
<input type="radio"/>	0.0	28.6	31.6	10.3	16.5	8.9	4.1	

	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
<input checked="" type="checkbox"/>			24.4731	13.5487	8.1467	2.0968	0.4993	0.3298	0.98	41.08

Material Description	USCS	AASHTO
<input type="radio"/> Sandy Fine to Coarse Gravel, Trace Silt	GP	

<p>Project No. PG60424 Client: Stantec Michigan</p> <p>Project: Argo Dam Toe Drain Evaluation Ann Arbor, MI</p>	<p>Remarks:</p> <p><input type="radio"/> Boring: B7 Sample: LS5</p>
<p>Soil and Materials Engineers, Inc.</p> <p>Plymouth, MI</p>	

Figure 5