



FINANCE DEPARTMENT

PURCHASING OFFICE
124 W. Michigan Avenue, 8th floor
Lansing, Michigan 48933-1603
(517) 483-4124 / FAX (517) 483-4524
<http://www.lansingmi.gov/finance/purchasing>

September 27, 2011

NOTICE TO QUOTERS Q/12/042 RIVERTRAIL REPAIRS 2011

The City of Lansing officially distributes all Purchasing documents through the Michigan Inter-governmental Trade Network (MITN) and the City of Lansing Purchasing Office. Our office no longer mails bid documents, notices or addendums to our vendors. To register for the MITN system or access bid information, including addendums, go to www.mitn.info

Quotes marked “Q/12/042 RIVERTRAIL REPAIRS 2011 ” will be accepted at the **Finance Department, Purchasing Office, 8th floor City Hall, 124 W. Michigan Avenue, Lansing, Michigan 48933, until 3:00 p.m., local time in effect on OCT. 5, 2011.**

Official City issued quote form must be returned via fax, U.S. mail or in person.

Quote results will **only** be released via email or self-addressed stamped envelopes. Please forward your email request to: srobinso@lansingmi.gov. City of Lansing encourages quotes from all vendors including MBE/WBE and Lansing-based vendors.

The City of Lansing gives preference to Lansing-based job providers in the procurement of all goods and services, and will give priority to those firms that provide the City with goods the City may require for this or other projects as made or provided for by United States based firms, with appropriate documentation provided with bid response showing U.S. manufacturing or assembly.

Any contractual or quote package questions should be directed to Stephanie Robinson CPPB, Senior Buyer, at (517) 483-4128, fax (517) 483-4524. Technical questions may be directed Dick Schafers at (517) 483-4283

Stephanie Robinson CPPB
Senior Buyer

Solicitation Number: Q/12/042

Solicitation Name: RIVERTRAIL REPAIRS 2011

The City of Lansing Purchasing Office is collecting information regarding the use of the MITN e-procurement system. We are also collecting demographic information regarding woman-owned, minority-owned and Lansing based business. This form will not be used during the evaluation of bids or proposals. You may return this sheet, which is voluntary, with your submittal or shortly thereafter. Please, do not staple this to your bid document.

I. Where did your firm receive of this solicitation? Please check all that apply.

City of Lansing Purchasing Web Page <http://www.mitn.info>

City of Lansing Purchasing Office

Other, please

list: _____

II. Demographic Information:

Is your firm located or have a business office within the corporate city limits of Lansing
yes _____ no _____

Is your firm owned (at least 51% ownership), operated and controlled by a member of the following minority groups? If so, please check all that apply:

African-American

Hispanic-American

Native-American (American Indian, Eskimo, Aleut, Native Hawaiian)

Asian-Pacific

Asian-Indian (India, Pakistan and Bangladesh)

Disabled-Owned

Is your firm owned (at least **51%** ownership), operated and controlled by a female: Yes _____ No _____

III. Company Information

Federal Tax ID Number _____

Firm Name

Address (Street, City, State, ZIP)

Phone Number

Fax Number

Web Site Address

Contact Person

Thank you for your participation.

CITY OF LANSING
 FINANCE DEPARTMENT-PURCHASING SECTION
 8TH FLOOR CITY HALL
 124 W. MICHIGAN AVENUE
 LANSING, MICHIGAN 48933

THIS IS NOT AN ORDER

NOTE: If your bid/quotation is not returned and **completed** on this form, it may not be considered.
 Bid/quotation number must appear on outside of return envelope.

REQUEST FOR QUOTE # Q/12/042

FOR: RIVERTRAIL REPAIRS 2011

DATE: September 27, 2011

FOR: PARKS DEPARTMENT

QUOTES DUE 3:00 PM, LOCAL TIME IN EFFECT OCT. 5, 2011

The City of Lansing Purchasing Office is requesting quotes for Rivertrail Repairs per the attached specifications.
Failure to complete and return all required forms may result in your QUOTE being declared non-responsive.

ITEM	QTY	DESCRIPTION	SUM LUMP TOTAL
A	1	REPAIRS TO RIVERTRAIL PER ATTACHED SPECS.	\$
B	1	ALTERNATE : PIERS – HELICAL PILINGS	\$
C	1	ALTERNATE – PIERS – CONCRETE COLUMNS	\$

Location – Rivertrail located between Cedar St., and Pennsylvania Ave. – between Red Cedar River and Board of Water and Light Storage Yard.

The City reserves the right to accept any quote, to reject any or all quotes and to make the award in the best interest of the City.

All vendors shall be current in payment of any taxes, licenses, fees, permits or any other monies due the City of Lansing at time of quote due date as per City of Lansing Ordinance Section 206.02(a)1(G).

Any contractual or quote package questions should be directed to Stephanie Robinson, Purchasing, at (517) 483-4128, fax (517) 483-4524. *Technical questions may be directed to Dick Schaefer at (517) 483-4283.*

FEDERAL I.D.# _____	ADDRESS _____	NOTE: Quote results will only be released via email request.
COMPANY _____	CITY & STATE _____	
SIGNATURE _____	TELEPHONE _____	
PRINTED NAME _____	F.O.B. _____	
TITLE _____	SHIP VIA/ROUTING: _____	
DATE: _____	TERMS: _____	

MICHIGAN CIVIL RIGHTS ACT

Contractor shall not discriminate in hiring or its terms and conditions of employment on the basis of race, religion, creed, nation origin, color, sex, marital status, age, height, or weight, nor on the basis of handicap except where the same is based on a bona fide job requirement. Neither shall Contractor discriminate in the sales of products or the rendering of services pursuant to this contract on the basis of any of those categories.

DATE _____

REQUEST FOR QUOTE
Q/12/042

Please complete Section I and Section II.

Section I

QUOTE AND AWARD

Initial: _____

The undersigned, having become thoroughly familiar with and understanding the entire quote documents attached hereto, agrees to provide the services as specified herein, for the total fees as stipulated herein, subject to negotiation.

I hereby state that all of the information I have provided is true, accurate and complete. I hereby state that I have authority to submit this quote which will become a binding contract if accepted by the City of Lansing. I hereby state that I have not communicated with, nor accepted anything of value from an official or employee of the City of Lansing that would tend to destroy or hinder free competition.

I hereby state that I have read, understand and agree to be bound by all the terms of this quote document.

Please initial next to Quote and Award, sign Section II and submit with your response to this solicitation.

Please be aware that this is a binding agreement that a Purchase Order may not be issued for goods/services quoted, but that the City may elect to obtain those goods/services by the use of a procurement card and only by that method.

Section II

SIGNATURE

SIGNED: _____ NAME: _____

TITLE: _____ DATE: _____

FIRM NAME: _____

FEDERAL TAX ID NUMBER: _____

ADDRESS: _____
(Street) (City) (State) (Zip)

PHONE: (_____) _____ FAX: (_____) _____

SPECIFICATIONS

The City of Lansing is requesting quotes for Repairs to the Rivertrail – Location between Cedar St. and Pennsylvania Ave and between the Red Cedar River and the Board of Water and Light Storage yard. See attached drawings and specifications.

Work scope will include removal of 45 linear feet of trail and installation reinforced concrete section of pathway with curb and support piers. There are **two additional alternates**: piers will either be helical pilings or concrete columns.

Work needs to be completed by Nov. 5, 2011.

Major Contract Items: demolition, concrete pier, curb and flat work, helical piles, site restoration

Price should include material and labor. Quotes should be valid for 30 days.

Any additional charges should be listed below:



Virg Bernero, Mayor

FINANCE DEPARTMENT

PURCHASING OFFICE

124 W. Michigan Avenue, 8th floor

Lansing, Michigan 48933-1603

(517) 483-4124

<http://www.lansingmi.gov/finance/purchasing>

**CERTIFICATION REGARDING
DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS**

The prospective participant certifies, to the best of its knowledge and belief, that it and its principals:

Are not presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from participation in transactions under any non-procurement programs by any federal, state or local agency.

(2) Have not, within the three year period preceding, had one or more public transactions (federal, state, or local) terminated for cause or default; and

(3) Are not presently indicted or otherwise criminally or civilly charged by a government entity (federal, state, or local) and have not, within the three year period preceding the proposal, been convicted of or had a civil judgment rendered against it:

(a) For the commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public transaction (federal, state, or local), or a procurement contract under such a public transaction;

(b) For the violation of federal, or state antitrust statutes, including those proscribing price fixing between competitors, the allocation of customers between competitors, or bid rigging; or

(c) For the commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

I understand that a false statement on this certification may be grounds for the rejection of this proposal or the termination of the award. In addition, the general grant of this authority exists within the City's Purchasing Ordinance, Sec. 206.02 (a) (1) (G).

I am able to certify to the above statements.

Name of Agency/Company/Firm *(Please Print)*

Name and title of authorized representative *(Please Print)*

Signature of authorized representative

Date

I am unable to certify to the above statements. Attached is my explanation.

A. PREPARATION OF BID: Execute bid fully and properly. Submit the bid on this form in a sealed envelope to this office prior to the opening time when bids will be publicly opened and read aloud.

B. SIGNATURES: All bids, notifications, claims and statements must be signed as follows:

(1) **CORPORATIONS:** Signature of official shall be accompanied by a certified copy of the resolution of the Board of Directors authorizing the individual signing to bind the corporation.

(2) **PARTNERSHIPS:** Signature of one partner shall be accompanied by a certified copy of the power of attorney authorizing the individual signing to bind all partners. If bid is signed by all partners no authorization is needed.

C. REJECTION OR WITHDRAWAL: The City reserves the right to reject any bids and to waive any defects in bids. Bids may not be withdrawn within 90 days after opening date without forfeiting bid security.

D. CONTRACT: Upon acceptance by the City, this document will constitute the contract. The contract, however, shall not be in force until the Contractor has complied with all of the requirements of insurance and bonds.

E. DEFAULT TO CITY: It is understood that any bidder who is in default to the City at the time of submittal of the bid shall have his bid under the proposal declared null and void.

GENERAL CONDITIONS

1. DEFINITIONS:

"CITY" - the City of Lansing.

"DIRECTOR" - the head of the Department indicated in the proposal or his authorized representative.

"CONTRACTOR" - the bidder whose proposal is accepted by the City.

"NOTIFICATION" - written notice delivered in person or by mail.

"CONTRACT DOCUMENTS" - this document and supplemental specifications and drawings.

2. CONFLICTS AND OMISSIONS:The intent of the contract documents is to provide everything necessary for the proper execution of the work. In case of conflict, the work shall not proceed until a decision has been agreed upon by all parties concerned. Directors decision shall be final.

3. ROYALTIES, PATENTS, NOTICES AND FEES: Contractor shall give all notices and pay all royalties and fees. He shall defend all suits or claims for infringement of any patent rights and shall save the City harmless from loss on account thereof. He shall comply with all laws, ordinances and codes applicable to any portion of the work.

4. MATERIALS AND WORKMANSHIP: Unless otherwise specified all materials and workmanship shall be new and of the best grade of their respective kinds for the purpose. Whenever an article, material, or equipment is specified by name, a substitute of equal qualifications may be used upon the written approval of the Director.

5. OTHER CONTRACTS: The City may let other contracts in connection with the work and the Contractor shall properly connect and coordinate his work with the work of such other contractors to execute their work as may be anticipated by these documents.

6. INSPECTION: Contractor shall at all times permit and facilitate inspection of the work by the Director.

7. TERMINATION FOR BREACH: The City may terminate this contract for violations hereof when violations are not stopped immediately and corrected within a reasonable length of time after notification by the Director. In the event of such termination, the City may complete the contracted work and the contractor will be liable for any excess cost occasioned the City thereby and in such case the City may take possession of and utilize in completing the work such materials and equipment as may be on the site and necessary therefore.

8. GUARANTEE: Contractor shall furnish the City with a written guarantee to remedy any defects due to faulty materials or workmanship which appear in the work within one year from the date of final acceptance by the City.

9. PAYMENT: Payment for the work will be made in one sum at the completion of the contract except that, at the City's option, partial payments aggregating 90% of the value of the completed work may be made at monthly intervals when the bonds in section 12 are furnished. If Contractor expects to request partial payments he shall submit a schedule of costs and quantities of the various parts of the work aggregating the total contract sum. When applying for payments, Contractor shall submit a statement based upon this schedule, itemized and supported as the Director may require.

Contract will not be considered complete until the work has been finally accepted by the City Unit and the Director and the following have been furnished:

(a) The required guarantees, and

(b) satisfactory evidence that all payrolls, material bills, and other indebtedness connected with the work, have been paid.

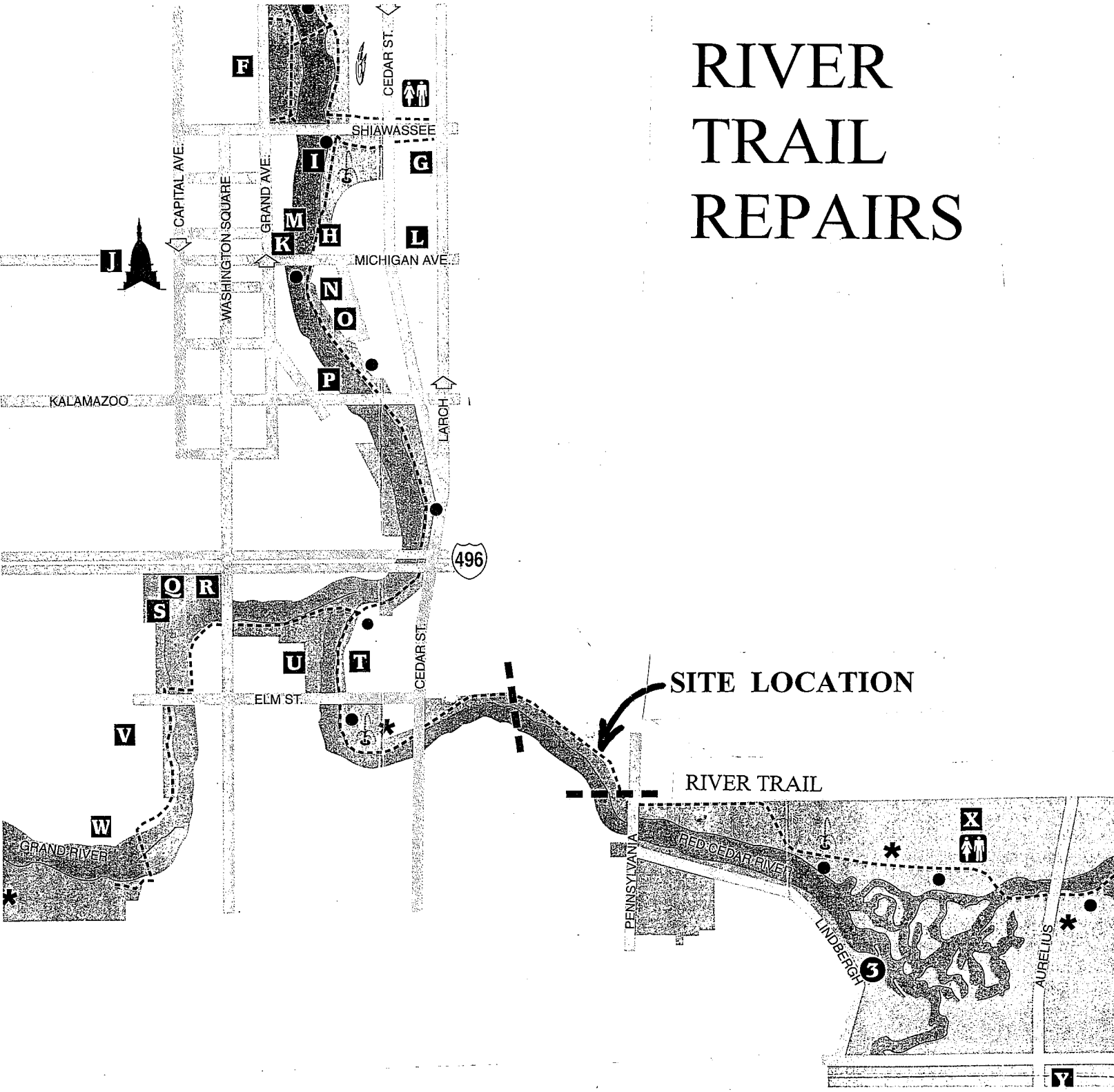
(c) If contract is terminated by the City, Contractor shall be entitled solely to payment for that portion of the contract completed by said Contractor at the time of termination minus set off and/or damage to City occasioned by Contractor's breach. Payment shall not be made until after contract project is completed, as determined by the Director.

10. LIABILITY FOR TAXES: When the terms of this contract involves the lease of property real or personal to the City, it is understood that lessor shall be solely responsible for the payment of all taxes of any nature whatsoever that accrue on the property during the terms of the lease.

11. INSURANCE: No work connected with this contract shall be started until the Contractor has submitted evidence to the Director and City Clerk that (a) all workmen are insured to protect him from claims for damages for personal injury or death which may arise from operations under this contract and that (b) he is covered by \$1,000,000.00 combined single limit for personal injury and property damage. All of the above insurance shall be maintained during the life of this contract. The City shall be carried as an "Additional Insured". Partial payments shall not relieve the Contractor from full responsibility for any damage which may result from any cause including fire or other casualty until completion of the contract and final payment. Any casualties shall not relieve the contractor from performing the contract. All insurance must include an endorsement providing for twenty (20) days prior written notice of termination, expiration, or material change of terms.

12. HOLD HARMLESS: To the fullest extent permitted by law, the contractor/vendor shall indemnify, defend, and hold harmless the City of Lansing, its officers, agents, employees, elected, and appointed officials, and volunteers from and against any and all claims, losses or liability, including attorney's fees, arising from injury or death to persons or damage to property occasioned by any act, omission, or failure of the contractor/vendor and any of its officers, agents, employees, and volunteers in satisfying the terms required by this contract.

RIVER TRAIL REPAIRS



LOCATION MAP

BW & L YARD

FENCE

EXISTING CONCRETE

EXISTING TIMBER RETAINING WALL

WOOD DECK (PROTECT)

16+00

15+00

RIVER TRAIL

NOTE LOCATION OF STORM LINES

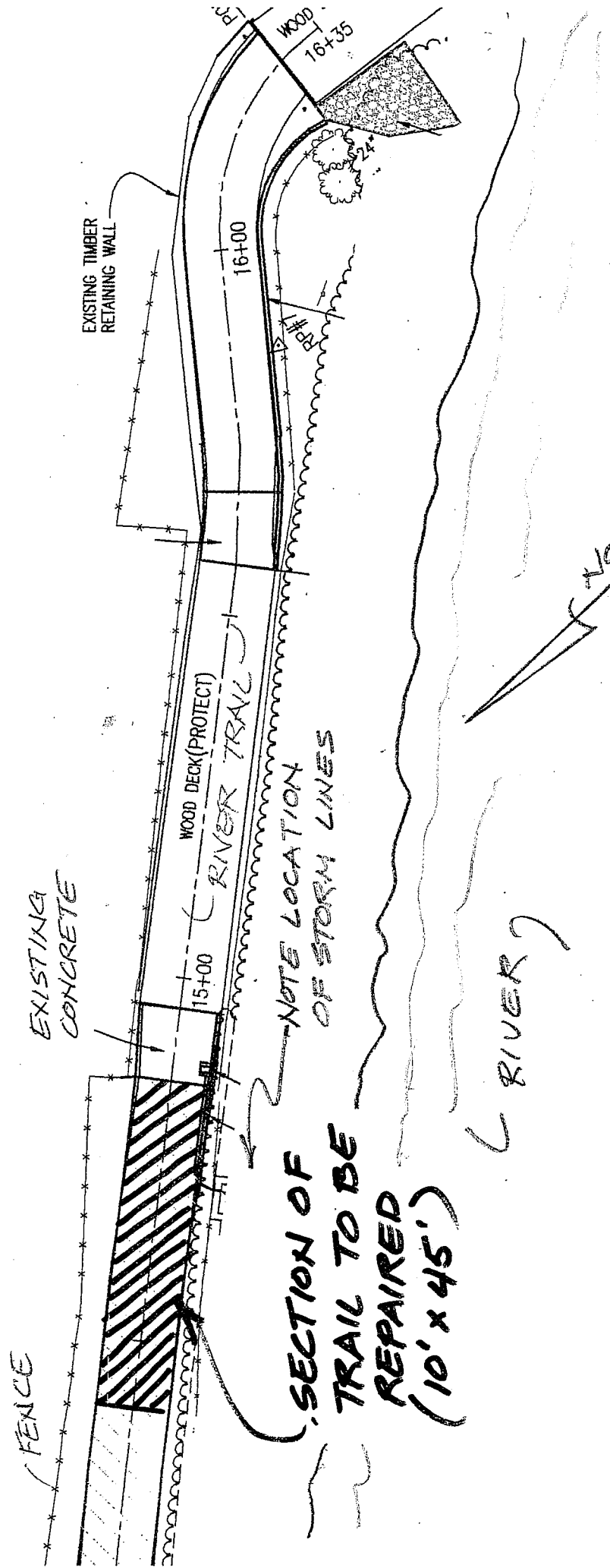
SECTION OF TRAIL TO BE REPAIRED (10' x 45')

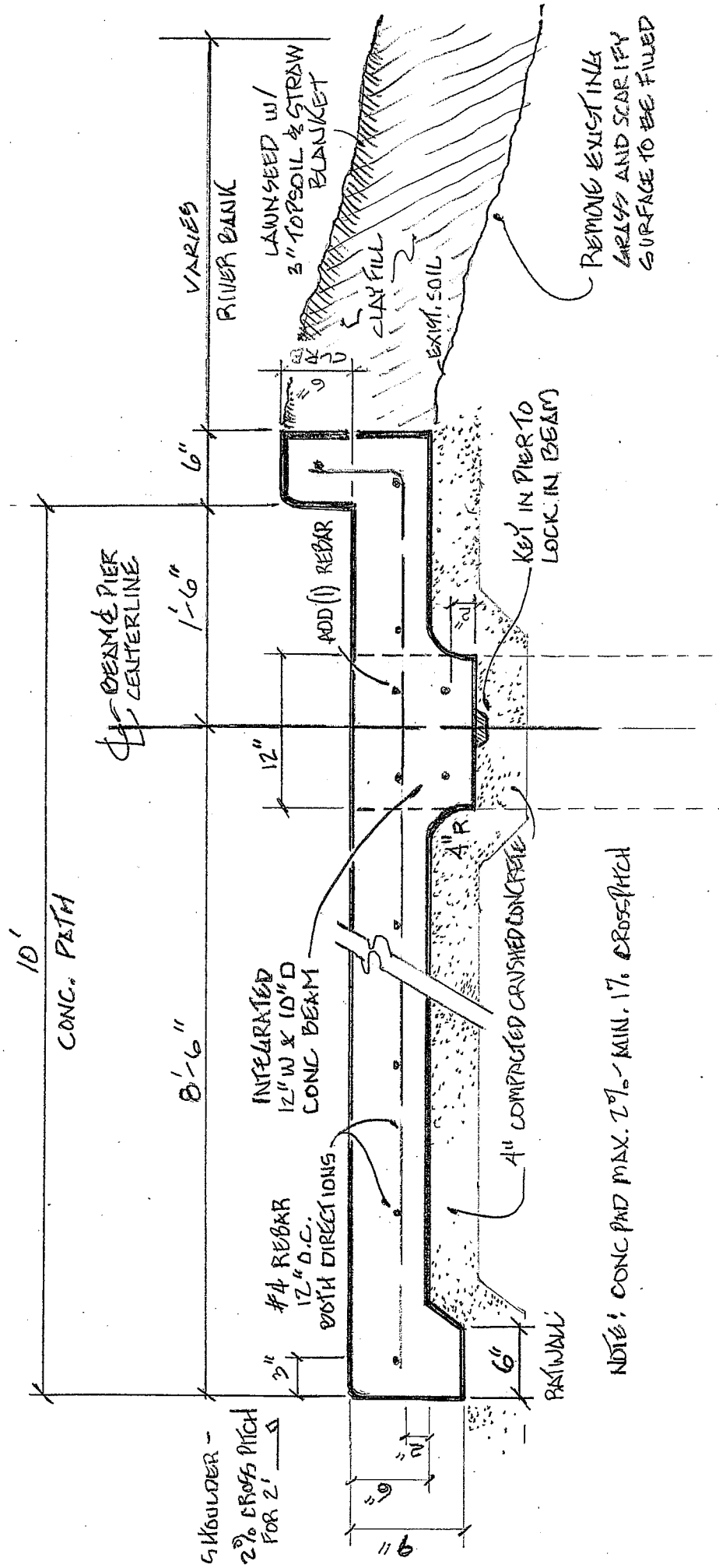
WOOD 16+35

RIVER

NORTH

1" = 20'





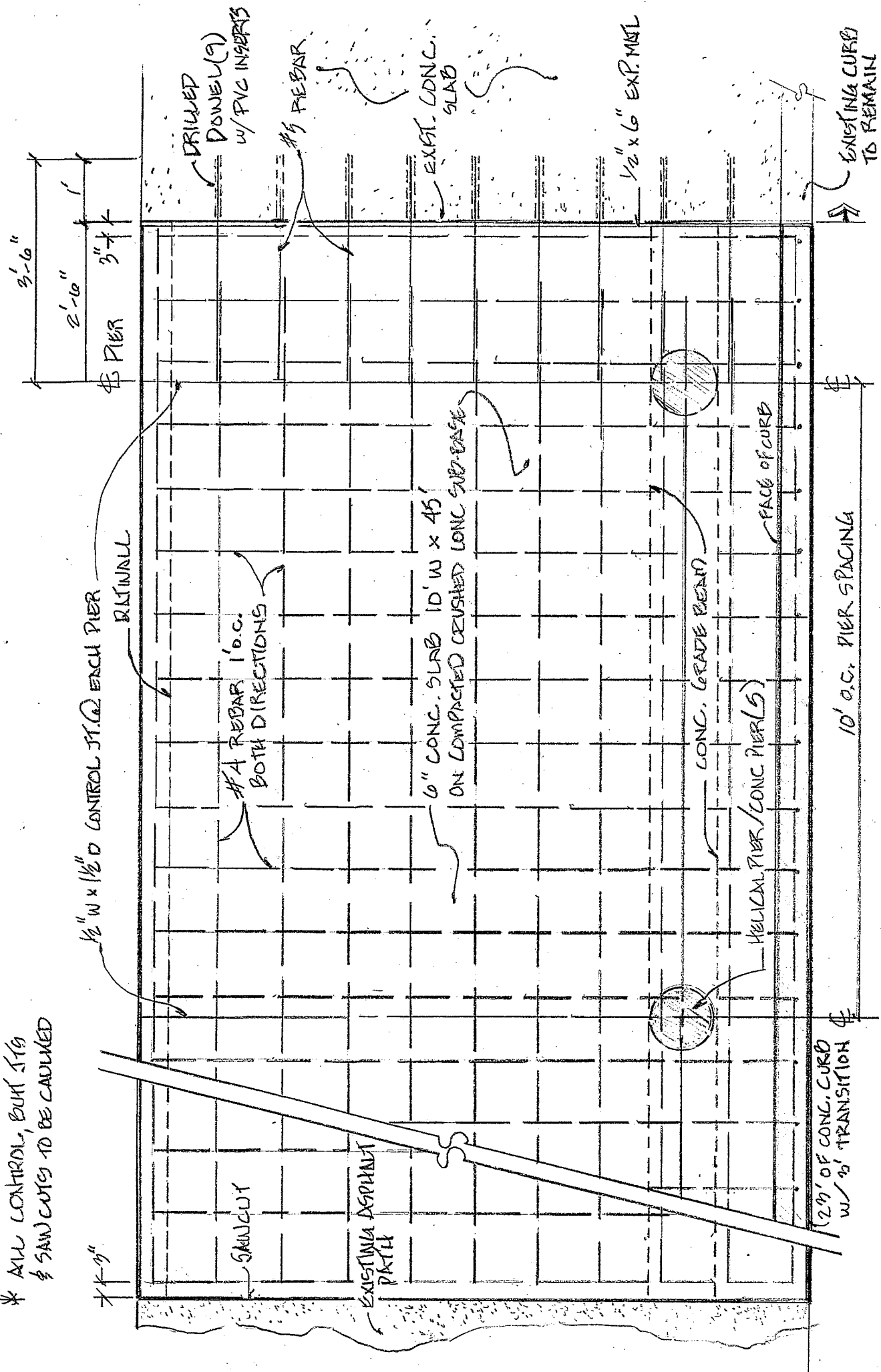
NOTE: CONC PAD MAX. 2% MIN. 1% CROSSPITCH

1 PROPOSED CONCRETE PATH CROSS-SECTION
SCALE: 1" = 1'-0"

7/11/2011



* ALL CONTROL, BUT ITS
\$ SAN CUTS TO BE CALLED



2 PROPOSED CONCRETE PATH - PLAN VIEW

SCALE: 1/2" = 1'-0"

RIVERTRAIL REPAIR - 2011

Lansing City Hall
Lansing Park and Recreation Dept.
Lansing, Michigan

Ref: River walk damage @ BWL yard
area between Cedar and Penn. Sts.

REQUEST FOR QUOTES:

The City of Lansing is requesting quotes for site construction repair work on the City's River Trail. The repair is situated midway between Cedar Street and Pennsylvania Avenue sandwiched in between the Red Cedar River and Board of Water and Light storage yard and west of the trestle bridge (see location map)

PROJECT SCOPE:

It is the City's intent to remove that portion of the asphalt pathway that has cracked and settled, due to soil erosion, and replace with a reinforced concrete pathway with curb and support pilings. Work shall include minor filling, stabilizing and compacting of the soil associated with the proposed and existing concrete structures.

DEMOLITION:

Existing asphalt path, as marked, shall be saw cut and removed by Contractor and taken to a legal off-site location for disposal. Existing broken curb is to be removed. Contractor shall protect remaining asphalt path, site structures, vegetation and river bank; any damage shall be repaired or replaced at Contractor's expense. Due to 10,000 LB GVW limit on path, equipment shall be limited to skid steer, mini-hoe, or small backhoe; one-ton dump truck. A gate is available into BWL yard, Contractor will need permission for access.

STABILIZATION:

Path sub-base material (crushed concrete) shall be saved for use under proposed concrete path and as compactable fill for eroded sub-structure areas. The current situation requires subgrade material be replaced under the existing concrete transition slab and catch basin located between the asphalt and wood boardwalk portions of the path. This area is to be filled and compacted in 4" to 6" lifts by the Contractor using a plate compactor and/or 'pogo stick' (electric or pneumatic) to reach 95% minimum compaction. Additional clay soil shall be used to fill along bank as needed outside the proposed/existing concrete structures. The vegetative (lawn) area on riverbank side is to be scarified with equipment prior to placement of clay fill to raise shoulder of path as needed.

GRADES & DRAINAGE:

Proposed concrete path shall have a maximum of 2% cross pitch; 1% minimum. Alignment and spot elevations of existing asphalt path will be noted prior to construction, to facilitate placement of new path to same configuration. Proposed path shall not have a longitudinal slope greater than 5%. A 2% cross slope shall be maintained along the non-curb shoulder of the proposed path for a width of two feet where possible. Existing surface drainage pattern shall be maintained. Top of piers shall meet at required depth of grade beam to create a continuous, compacted sub-base 10" below top of concrete path. See plan.

CONCRETE SPECIFICATIONS:

The concrete slab and integrated curb shall have a cured minimum strength of 4000 psi. A maximum slump of 4" during installation. Placement within 1-1/2 hours of batch time. No additional water after one hour from batch time. Contractor to submit batch source and mix composition to Owner prior to pour. Broom finish. Contractor shall tamp and place mix thoroughly around reinforcement to avoid honeycombs.

Scoring, laterally, shall be done at each piling location. This can be done at time of pour, or with a 'soft' cut blade as soon as feasible. The intent is to eliminate random cracking of slab. White pigmented cure material shall be evenly applied (to mfg. specs.) with a sprayer; immediately after tooling operations are completed. Clean up concrete residue and stains from asphalt path, access point, and site. The concrete grade beam is to be poured with slab. Contractor shall provide a compacted, well drained sub-base that shall flush with pier caps to create a consistent, continuous beam of concrete the length of the slab (approx. 45 ft.). See Dwg. On-site testing for the Owner will be done by NTH. Concrete transit truck cannot travel on pathway. All control and isolation joints; saw cuts, shall be sealed with polyurethane caulk.

CONCRETE REINFORCEMENT:

The accompanying plan and cross-section drawings illustrate the required layout and size of reinforcing bars for the project. The steel rebar shall be Grade 60. Standard tie wire shall be utilized. Galvanized or coated leg rebar support chairs or concrete half-bricks may be used to suspend bottom of rebar mat 2" above compacted sub-base during pouring operations. All reinforcement bar shall have a minimum of 2" of concrete cover. The concrete grade beam (12" W x 10" D) shall have a #3 rebar collar every 4 ft. to position the 4 - #4 longitudinal rebar that are part of the beam's 45 ft run to both ends of proposed path. Contractor shall note the one ft. dowelled connections within existing concrete slab using #5 rebar with pvc sleeve tie-in to proposed concrete path. Place 1/2" expansion along this butt joint and seal with polyurethane caulk. Overlaps in rebar splices shall be 15".

PIER ALTERNATIVES:

The project requires the installation of five piers (ten foot intervals) to support the grade beam portion of the concrete slab. The size and strength of the piers are to meet a 5 ton working load, resulting in a 10 ton ultimate load. The design is to include an evaluation of the lateral loading as well. One boring log (see attached) was completed by NTH for your reference.

The below pier design parameters in the two add alternates are what your quoted prices are to be based on. These might be modified based upon any design modifications. Contractor is requested to provide an installed price for each of the two alternatives presented:

1. **Concrete Pier.** Auger 8 ft. deep circular hole, 12" in diameter, with 4 - #4 vertical reinforcing bar and #3 collar every 28". Maintain 2" minimum concrete cover. Sonnatube shall be used (one foot minimum length) at top of pier to set grade and incorporate key insert. This key will lock slab to support piers. See section. A soil boring by others will be done to determine soil characteristics prior to field work.
2. **Helical Pier.** Install galvanized helical piers to a approximate depth of 14 ft. Cut off and cap pier with flat plate. Utilizing a standard 6"x 6" galv. plate fitting, weld a 12" x 12" flat, galv. top plate to fitting.

MISC:

Storm sewer inspections, soil boring test by others.
Contractor shall note storm sewer locations (2) before digging or drilling.

LOG OF TEST BORING NO: TB-1

Project Name: *Lansing River Trail*

Project Location: *Lansing, Michigan*



NTH Consultants, Ltd.

NTH Proj. No.: 73-110803

Checked By: *[Signature]*

SUBSURFACE PROFILE					SOIL SAMPLE DATA								
ELEV. (FT)	PRO-FILE	ELEV	GROUND SURFACE ELEVATION: 97.0	DEPTH	DEPTH (FT)	SAMPLE TYPE/NO.	BLOWS/ 6-INCHES	STD. PEN RESIST. (N)	REC (in)	FIELD TEST (ppm)	MOIST. CONTENT (%)	DRY DESNITY (PCF)	UNCONF. COMP ST (PSF)
		96.8	PAVEMENT: Asphalt	0.2									
95		95.5	FILL: Gray GRAVELLEY SAND	1.5		S-1	4 5 5	10	5				*8000
			Hard Brown SANDY CLAY with Trace Silt and Organic Matter (Roots)		5	S-2	3 5 5	10	5				*9000
90		90.5	Medium to Stiff Brown CLAY with Trace Silt, Sand, and Gravel, and Seams of Organic Matter	6.5		S-3	4 2 4	6	5				*8000
		88.0	Loose Light Brown FINE SAND with Trace Silt and Clay	9.0	10	LS-1	3 3 3	6	6				
85		85.0	Very Loose Light Brown CLAYEY SAND with Trace SILT	12.0									
		83.0	Very Loose Gray SAND with Trace Silt and Organic Matter (Roots)	14.0	15	S-4	2 1 1	2	8				
80		79.5	Medium Compact Gray GRAVELLY SAND with Trace Silt and/or Occasional Cobbles and Boulders	17.5	20	LS-2	9 11 8	19	12				
75					25	LS-3	12 12 12	24	12				
70													
		68.0	Medium Compact Gray SILTY SAND	29.0	30	LS-4	6 5 6	11	10				
65		67.0	END OF BORING AT 30.0 FEET.	30.0									

LOG OF TEST BORING 001-0411-LOG.GPJ NTH CORPORATE NEW.GDT 8/8/11

Total Depth: 30 FT
Drilling Date: 7/28/11
Inspector: D. Hibner
Contractor: West Michigan Drilling
Driller: G. Strauch
Drilling Method:
 CME 75 Truck mounted drill rig with 3 - 1/4 inch inside diameter hollow stem auger to end of boring.

Water Level Observation:
 Groundwater encountered at 14 feet during drilling. Goundwater observed at 10 feet upon completion of drilling. Borehole caved at 14 feet upon completion.

Notes:
 *Pocket Penetrometer Value

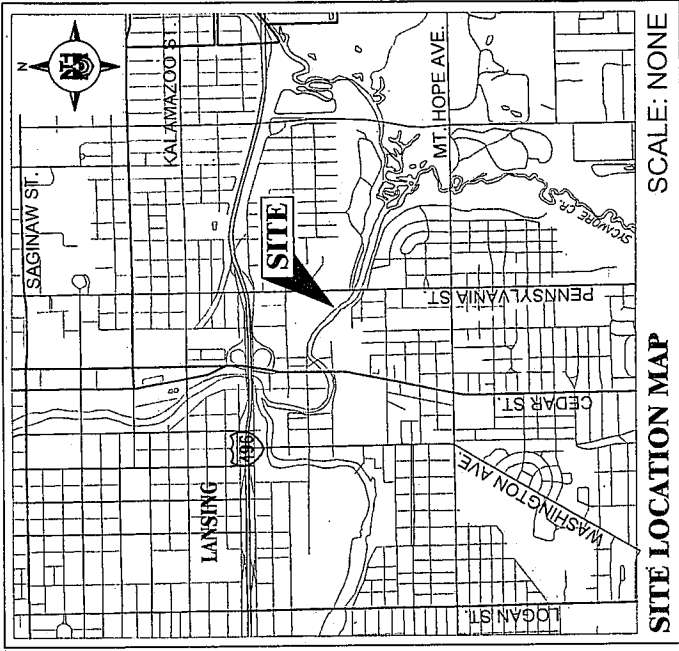
Plugging Procedure:
 Borehole backfilled with soil cuttings, and pavement patched with asphalt cold patch.

GPS Coordinates:

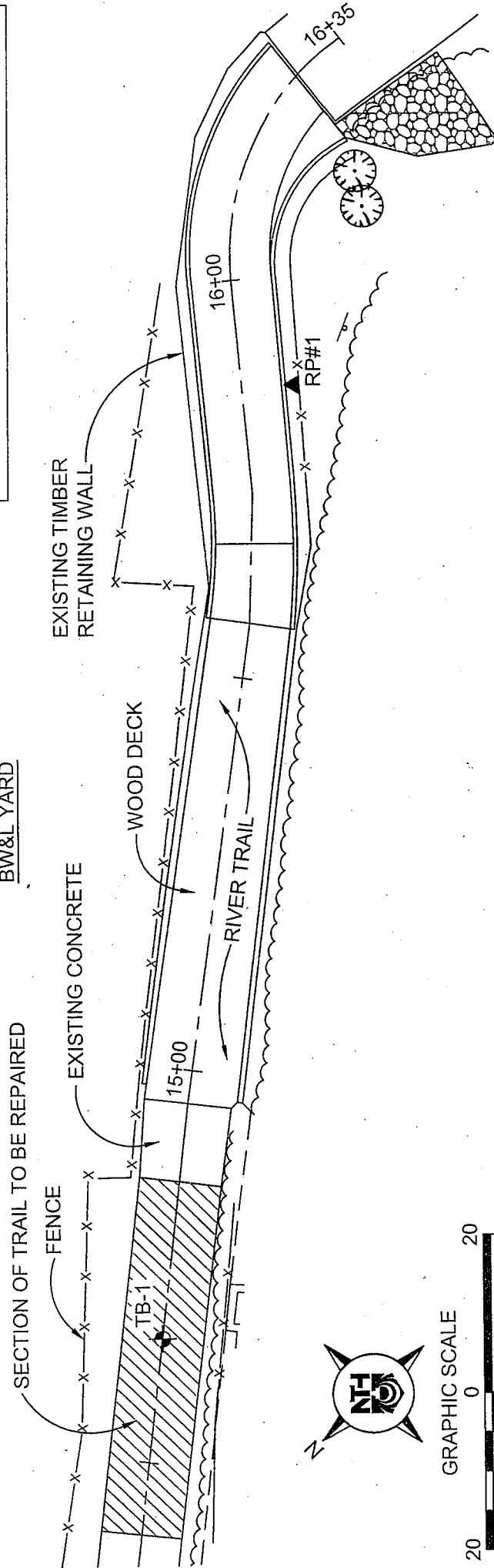
Figure No. 3

LEGEND


 TEST BORING DRILLED BY WEST MICHIGAN DRILLING COMPANY
 UNDER THE OBSERVATION OF NTH CONSULTANTS, LTD.
 ON JULY 28, 2011



BW&L YARD



NTH PROJECT No.: 73-110803-00	DESIGNED BY: RPB	CHECKED BY: GLM	DRAWING SCALE: 1" = 20'
CAD FILE NAME: D11080301	DRAWN BY: SHB	INCEP DATE: 03 AUG 2011	PLOT DATE: 04 AUG 2011


NTH Consultants, Ltd.
 Infrastructure Engineering
 and Environmental Services

RIVER TRAIL REPAIRS
 LANSING, MICHIGAN

TEST BORING LOCATION PLAN

FIGURE No. **1**

NTH Consultants, Ltd.

A Neyer, Tiseo & Hindo Company

GENERAL NOTES

TERMINOLOGY

Unless otherwise noted, all terms utilized herein refer to the Standard Definitions presented in ASTM D 653.

PARTICLE SIZES

Boulders	- Greater than 12 inches (305mm)
Cobbles	- 3 inches (76.2mm) to 12 inches (305mm)
Gravel - Coarse	- 3/4 inches (19.05 mm) to 3 inches (76.2mm)
Fine	- No. 4 - 3/16 inches (4.75mm) to 3/4 inches (19.05 mm)
Sand - Coarse	- No. 10 (2.00mm) to No. 4 (4.75mm)
Medium	- No. 40 (0.425mm) to No. 10 (2.00mm)
Fine	- No. 200 (0.074mm) to No. 40 (0.425mm)
Silt	- 0.005mm to 0.074mm
Clay	- Less than 0.005mm

CLASSIFICATION

The major soil constituent is the principal noun, i.e., clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

Second Major Constituent (percent by weight)	Minor Constituents (percent by weight)
Trace - 1 to 12%	Trace - 1 to 12%
Adjective - 12 to 35% (clayey, silty, etc.)	Little - 12 to 23%
And - Over 35%	Some - 23 to 33%

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modified; i.e., silty clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils; i.e., silty clay, trace of sand, little gravel.

<u>Consistency</u>	<u>Unconfined Compressive Strength (psf)</u>	<u>Approximate Range of (N)</u>
Very Soft	Below 500	0 - 2
Soft	500 - 1000	3 - 4
Medium	1000 - 2000	5 - 8
Stiff	2000 - 4000	9 - 15
Very Stiff	4000 - 8000	16 - 30
Hard	8000 - 16000	31 - 50
Very Hard	Over 16000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

COHESIONLESS SOILS

<u>Density Classification</u>	<u>Relative Density %</u>	<u>Approximate Range of (N)</u>
Very Loose	0 - 15	0 - 4
Loose	16 - 35	5 - 10
Medium Compact	36 - 65	11 - 30
Compact	66 - 85	31 - 50
Very Compact	86 - 100	Over 50

Relative density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATIONS

- AS - Auger Sample - directly from auger flight
- BS - Miscellaneous Sample - bottle or bag
- S - Split Spoon Sample - ASTM D 1586
- LS - Split Spoon Sample S with Liner Insert 3 inches in length
- ST - Shelby Tube Sample - 3 inch diameter unless otherwise noted
- PS - Piston Sample - 3 inch diameter unless otherwise noted
- RC - Rock Core - NX core unless otherwise noted
- CS - Continuous Sample - from rock core barrel or continuous sampling device
- VS - Vane Shear

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0" outside-diameter, 1-3/8" inside-diameter, split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).