COMPLIANCE WITH THE CLEAN AIR AND WATER ACTS

Compliance with all applicable standards, orders, or requirements issued under section 206 of the Clean Air Act (42 U.S.C. 1857)(h), Section 506 of the Clean Water Act (33 U.S.C. 1368). Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15). (Contracts, subcontracts, and subgrants of amounts in excess of $100,000).

COMPLIANCE WITH AIR AND WATER ACTS

This Agreement is subject to the requirements of the Clean Air Act, as amended, 42 USC 1857 et. seq., the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended from time to time.

The Contractor and any of its subcontractors for work funded under this Agreement, in excess of $100,000 agree to the following requirements:

1. A stipulation by the Contractor or subcontractors that any facility to be utilized in the performance of any non-exempt contract or subcontract is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

2. Agreement by the Contractor to comply with all requirements of Section 114 of the Clean Air Act, as amended, (42 U.S.C. 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1318) relating to inspecting, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

3. A stipulation that as a condition for the award of the Contract prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA indicating that a facility utilized or to be utilized for the Contract is under consideration to be listed on the EPA list of Violating Facilities.

4. Agreement by the Contractor that he/she will include or cause to be included the criteria and requirements in paragraph (1) through (4) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the Government may direct as a means of enforcing such provision.

In no event shall any amount of assistance provided under this Agreement be utilized with respect to a facility which has given rise to a conviction under Section 113(c)(1) of the Clean Air Act or Section 309(c) of the Federal Water Pollution Control Act.

ENERGY EFFICIENCY REQUIREMENTS

Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L.94-163).

EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY

It is the policy of

to assure that all applicants for employment and all employees are treated on a fair and equitable basis without regard to their race, religion, sex, color, handicap, natural origin or age.

Such action shall include employment, promotion, demotion, recruitment or recruitment advertising, layoff or termination, rates of pay and other forms of compensation, and selection for training, whether apprenticeship and/or on-the-job-training.

Furthermore, this company agrees to make special recruitment efforts to hire the protected class whenever feasible. This company also agrees to adhere to all applicable federal, state, and local laws relating to Equal Employment Opportunity for all individuals.

_____ has been appointed Equal Employment Compliance (EEOC) Officer and shall be available for counseling, answering of questions in regards to this company policy, and to hear any complaints of discrimination. The EEOC Office may be reached by calling _____.

Signature:_____
(Bidding Contractor)

Title:
Date:

DEBARMENT CERTIFICATION

All contractors/subcontractors shall complete the following certification and submit it with the bid proposal.

The contractor/subcontractor certifies in accordance with Executive Order 12549 (Debarment and Suspension 2/18/86) that to the best of its knowledge and belief, that it and its principals:

2) Are not presently debarred, suspended, proposed for debarment, declared negligible, or voluntarily excluded from covered transactions or contract by any Federal department or agency for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 as amended, Executive Order 11246 as amended or any other Federal law;

   d) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

   e) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(a) of this certification; and

   f) Have not within a three year period preceding this bid has one or more public (Federal, State or local) transactions or contracts terminated for cause or default.

3) Where the contractor is unable to certify to any of the statements in this certification, such prospective contractors shall attach an explanation to this certification form.

Firm Name: _____

Project: _____

Printed Name and Title of Authorized Representative: _____

Signature: _____

Date: _____

.

LEAD BASED PAINT

A. All paint to be lead free.

B. Existing lead paint to be removed or concealed with an acceptable covering (paint, siding, etc.)

D. Warning

1. Use of lead-base paint materials on any surface, interior or exterior, is prohibited.

2. Lead-base paint removal is a dangerous task and safety precautions should be strictly enforced when workers are engaged in hazard abatement.

POTENTIAL DBE CONTRACTOR(S) LIST

For a listing of DBE (Disadvantaged Business Enterprise) contractors/subcontractors please contact:

Marilyn Clark
Division of Central Purchasing
200 E. Main Street, 3rd Floor
Lexington, KY 40507
(859) 258-3323
TDD [hearing impaired only] (859) 425-2563

Or

Todd Slatin
Division of Central Purchasing
200 E. Main Street, 3rd Floor
Lexington, KY 40507
(859) 258-3326
TDD [hearing impaired only] (859) 425-2563

PART VI

CONTRACT AGREEMENT

INDEX

PART VI

CONTRACT AGREEMENT

THIS AGREEMENT, made on the 7 day of MAY, 2015, by and between (1) Lexington-Fayette Urban County Government, acting herein called "OWNER" and
(2) BLUEGRASS CONTRACTING CORPORATION doing business as *(an individual) (a partnership) (a corporation) (limited liability company) located in the City of LEXINGTON, County of FAYETTE, and State of KENTUCKY, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of EIGHT HUNDRED SIXTY FOUR THOUSAND, NINE HUNDRED FIFTY NINE ~~——~~ 22 XX Dollars
($864,959.22) quoted in the proposal by the CONTRACTOR, dated APRIL 13, 2015, hereby agree to commence and complete the construction described as follows:

1. SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefor as prepared by Integrated Engineering, PLLC
for the Meadows-Northland-Arlington Neighborhood Improvement Project, Phase 5D

2. TIME OF COMPLETION

The time period estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as two hundred and seventy (270) calendar days. The time shall begin ten (10) days after the date specified in the Notice to Proceed with the Work.

3. ISSUANCE OF WORK ORDERS

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds or other considerations. The order of construction will be as determined by the Engineer after consultation with the CONTRACTOR and the OWNER.

4. THE CONTRACT SUM

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Contract, as quoted in the proposal, subject to any additions and deductions, as provided therein.

5. PROGRESS PAYMENTS

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, as estimated by the Engineer, less the aggregate of previous payments.

6. ACCEPTANCE AND FINAL PAYMENT

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

Before issuance of final certificate, the CONTRACTOR shall submit evidence satisfactory to the Engineer that all payrolls, material bills, and other indebtedness connected with the Work has been paid.

If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the CONTRACTOR, and the ENGINEER so certifies, the OWNER shall upon certificate of the ENGINEER, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

7. THE CONTRACT DOCUMENTS

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, and Proposal, and Plan Drawings and any related addenda form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

8. EXTRA WORK

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS)

SPECIFICATIONS

PART NO.	TITLE	PAGES
—		
I	Advertisement for Bids	AB 1 through 5
II	Information for Bidders	IB 1 through 9
III	Form of Proposal	P 1 through 38
IV	General Conditions	GC 1 through 53
V	Special Conditions	SC 1 through 129
VI	Contract Agreement	CA 1 through 5
VII	Performance and Payment Bonds	PB 1 through 7
VIII	Technical Specifications	TS 1 through 90

APPENDIX A LFUCG STANDARD DETAIL DRAWINGS

APPENDIX B GEOTECHNICAL REPORT

PLAN DRAWINGS

SITE PUBLIC IMPROVEMENT PLANS (ROADWAY, SIDEWALK, SANITARY AND STORM SEWERS

32 Sheets

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

Lexington-Fayette Urban County Government.
Lexington, Kentucky
(Owner)

ATTEST:

Clerk of the Urban County Council

BY: _____
Jim Gray
MAYOR

(Witness)

Mayor
(Title)

(Seal)

Bluegrass Contracting Corporation
(Contractor)

(Secretary)

BY: _____

(Witness)

Mark W. Johnson, President
(Title)

1075 Red Mile Rd, Lexington, KY 40504
(Address and Zip Code)

IMPORTANT: *Strike out any inapplicable terms.

Secretary of the Owner should attest. If the CONTRACTOR is corporation, Secretary should attest. Give proper title of each person-executing Contract.

PART VII

PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE BOND

2. PAYMENT BOND

BOND #2194825

PART VII

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

Bluegrass Contracting Corporation

(Name of CONTRACTOR)

PO Box 11638, Lexington, KY 40576

(Address of CONTRACTOR)

a Corporation, hereinafter

(Corporation, Partnership, or Individual)

called Principal, and North American Specialty Insurance Company

(Name of Surety)

650 Elm Street, Manchester, NH 03101

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Lexington-Fayette Urban County Government

(Name of OWNER)

200 E. Main Street, Lexington, KY 40507

(Address of OWNER)

hereinafter called "OWNER" in the penal sum of Eight Hundred Sixty Four Thousand Nine Hundred Fifty Nine and 22/100 Dollars, ($ 864,959.22), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for Meadows-Northland-Arlington Neighborhood Improvement Project, Ph 5D; Proj #643 in accordance with Drawings and Specifications prepared by _____ which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever, Principal shall be, and declared by OWNER to be in default under the Contract, the OWNER having performed OWNER'S obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

(1) Complete the Contract in accordance with its terms and conditions or

(2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the OWNER elects, upon determination by the OWNER and Surety jointly of the lowest responsible bidder, arrange for a Contract between such bidder and OWNER, and make available as Work progresses (even though there may be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) 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 the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract Price", as used in this paragraph shall mean the total amount payable by OWNER to Principal under the Contract and any amendments thereto, less the amount properly paid by OWNER to Principal.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREOF, this instrument is executed in 3 (number) each one of which shall be deemed an original, this the 22nd day of May, 2015.

ATTEST:

Ginger L Johnson
(Principal) Secretary

Bluegrass Contracting Corporation
Principal

BY: [signature] President (s)
PO Box 11638
(Address)
Lexington, KY 40576

BLUEGRASS CONTRACTING CORPORATION CORPORATE SEAL KENTUCKY

Witness as to Principal

~~650 Elm Street~~ MWT P.O. Box 11638
(Address)
~~Manchester, NH 03101~~ MWT Lexington, KY

North American Specialty Insurance Company
Surety

ATTEST:

Paula J Teague
(Surety) ~~Secretary~~

BY: Monica A. Kaiser
Monica A. Kaiser Attorney-in-Fact
121 S. Sherrin Ave
(Address)
Louisville, KY 40207

(SEAL)

Paula J. Teague, Witness
Witness as to Surety
121 S. Sherrin Ave
(Address)
Louisville, KY 40207

TITLE: _____
Surety
BY: _____

TITLE: _____

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

PART VII

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT: that

Bluegrass Contracting Corporation
(Name of Contractor)

PO Box 11638, Lexington, KY 40576
(Address of Contractor)

a Corporation, hereinafter
(Corporation, Partnership or Individual)

called Principal, and North American Specialty Insurance Company
(Name of Surety)

650 Elm Street, Manchester, NH 03101
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Lexington-Fayette Urban County Government
(Name of OWNER)

200 E. Main Street, Lexington, KY 40507
(Address of OWNER)

Obligee, hereinafter called OWNER, for the use and benefit of claimants as hereinafter defined, in the amount of Eight Hundred Sixty Four Thousand Nine Hundred Fifty Nine & 22/100 Dollars ($ 864,959.22) the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement is entering into a Contract with OWNER for Meadows-Northland-Arlington Neighborhood Improvement Project, Ph 5D, Proj #643 in accordance with Drawings and Specifications prepared by _____ which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:

   (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

   (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

   (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in 3 counterparts, each one of (number)

which shall be deemed an original, this the 22nd day of May, 20 15.

ATTEST:

Bluegrass Contracting Corporation
(Principal)

Ginger L Johnson
(Principal) Secretary

(SEAL)

BY: President(s)

PO Box 11638
(Address)
Lexington, KY 40576

Barry A. Stuart
(Witness to Principal)
P.O. Box 11638
(Address)
Lexington, KY 40576

North American Specialty Insurance Company
(Surety)

ATTEST:

BY: Monica A. Kaiser
Monica A. Kaiser (Attorney-in-Fact)

Paula J Teague
(Surety) ~~Secretary~~

(SEAL)

Paula J. Teague, Witness
Witness as to Surety
121 S. Sherrin Ave
(Address)
Louisville, KY 40207

121 S. Sherrin Ave
(Address)
Louisville, KY 40207

502-895-9377

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

NAS SURETY GROUP

NORTH AMERICAN SPECIALTY INSURANCE COMPANY
WASHINGTON INTERNATIONAL INSURANCE COMPANY

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT North American Specialty Insurance Company, a corporation duly organized and existing under laws of the State of New Hampshire, and having its principal office in the City of Manchester, New Hampshire, and Washington International Insurance Company, a corporation organized and existing under the laws of the State of New Hampshire and having its principal office in the City of Schaumburg, Illinois each does hereby make, constitute and appoint: Monica A. Kaiser

Its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, the following surety bond:

Principal: Bluegrass Contracting Corporation **Bond Number:** 2194825

Obligee: Lexington Fayette Urban County Government **Bond Amount:** See Bond Form

Bond Description: Meadows-Northland-Arlington Neighborhood Improvement Project, Phase 5D; Project #643, Bid No. 37-2015

Provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed the amount of:

FIFTY MILLION ($50,000,000) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both North American Specialty Insurance Company and Washington International Insurance Company at meetings duly called and held on the 9th of May, 2012:

"RESOLVED, that any two of the Presidents, any Managing Director, any Senior Vice President, any Vice President, any Assistant Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Company bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Company; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Company when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

By _____
Steven P. Anderson, Senior Vice President of Washington International Insurance Company & Senior Vice President of North American Specialty Insurance Company

By _____
David M. Layman, Vice President of Washington International Insurance Company & Vice President of North American Specialty Insurance Company

IN WITNESS WHEREOF, North American Specialty Insurance Company and Washington International Insurance Company have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers this 25th day of May 20 12.

North American Specialty Insurance Company
Washington International Insurance Company

State of Illinois
County of Cook ss:

On this 25th day of May 20 12, before me, a Notary Public personally appeared Steven P. Anderson, Senior Vice President of Washington International Insurance Company and Senior Vice President of North American Specialty Insurance Company and David M. Layman, Vice President of Washington International Insurance Company and Vice President of North American Specialty Insurance Company, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

"OFFICIAL SEAL"
DONNA D. SKLENS
Notary Public, State of Illinois
My Commission Expires 10/06/2015

Donna D. Sklens

Donna D. Sklens, Notary Public

I, Jeffrey Goldberg, the duly elected Assistant Secretary of North American Specialty Insurance Company and Washington International Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said North American Specialty Insurance Company and Washington International Insurance Company, which is still in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 22nd day of May, 2015.

Jeffrey Goldberg, Vice President & Assistant Secretary of Washington International Insurance Company & Assistant Secretary of North American Specialty Insurance Company

Client#: 165643 41BLUEGRASSC9

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 4/23/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER J Smith Lanier & Co-Lexington Powell-Walton-Milward P O Box 2030 Lexington, KY 40588	CONTACT NAME: Paula Hardin PHONE (A/C, No, Ext): 800 796-3567 FAX (A/C, No): 859 254-8020 E-MAIL ADDRESS: phardin@pwm-jsl.com
INSURED Bluegrass Contracting Corp. 1075 Red Mile Road Lexington, KY 40504	INSURER A : Charter Oak Fire 25615 INSURER B : Travelers Property Casualty Ins 36161 INSURER C : KY Assoc. General Contractors INSURER D : Great American E & S Insurance 37532 INSURER E : Travelers Property Casualty Co. 25674 INSURER F :

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X PD Ded:$5,000 X XCU - INCLUDED GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC			DTCO6E947548COF	07/01/2014	07/01/2015	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG 	$1,000,000 $300,000 $5,000 $1,000,000 $2,000,000 $2,000,000 $
E	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			DT810DT6E947548TIL	07/01/2014	07/01/2015	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) 	$1,000,000 $ $ $ $
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $10,000			DTSMCUP6E947548TIL	07/01/2014	07/01/2015	EACH OCCURRENCE AGGREGATE 	$8,000,000 $8,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N / A (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			188820	01/01/2015	01/01/2016	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $4,000,000 $4,000,000 $4,000,000
D	Pollution Liability			CSE254020100	07/01/2014	07/01/2015	$1,000,000 - Ea Condt $1,000,000 - Aggregate $25,000 - Deductible	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

REF: Project - Meadows-Northland-Arlington Neighborhood Improvements - Phase 5D
Certificate Holder is listed as Additional Insured as per written contract with respect to the General Liability and Auto Liability policies described above and subject to provisions and limitations of the policy.
Coverage shall be primary and non-contributory.
Coverage provides a 30 Day Notice of Cancellation.

CERTIFICATE HOLDER

Lexington Fayette Urban
County Government
200 East Main Street
Lexington, KY 40507

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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The ACORD name and logo are registered marks of ACORD

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PART VIII

TECHNICAL SPECIFICATIONS

INDEX

TECHNICAL SPECIFICATIONS

SECTION 1 - GENERAL PROVISIONS

1.1 KENTUCKY DEPARTMENT OF HIGHWAYS - SPECIF1CATIONS

Except as indicated on the Plans, and in the Contract Documents and Specifications, all items of work including materials, construction methods, method of measurement and basis of payment shall comply with the current edition of the Kentucky Transportation Cabinet/ Department of Highways Standard Specifications for Road and Bridge Construction and all current revisions.

With regard to the incorporation Standard Specifications of KYTC into these Technical Specifications, the following should be noted:

Unless either the content implicitly or the Plans and Contract Documents and Specifications explicitly indicate otherwise, all KYTC references to "the Department" should be construed as being references to the Lexington-Fayette Urban County Government (LFUCG).

Any discrepancy between the Standard Specifications of KYTC and the express intentions of Lexington-Fayette Urban County Government (i.e., Plans, Contract Documents and Specifications, and Lexington-Fayette Urban County Government Standard Drawings) shall be resolved in favor of the latter. (An example of one of the more common types of discrepancy is that which sometimes occurs with regard to the measurement of and payment for Work items.)

1.2 ABBREVIATIONS

Abbreviations of standards, codes, and publications used within these specifications are as follows:

ASTM	American Society of Testing and Materials
ANSI	American National Standard Institute
KYTC	Kentucky Department of Highways, "The Standard Specifications for Road and Bridge Construction", Current Edition

1.3 SCOPE

It is the intent that the CONTRACTOR, in accordance with the Plans, Specifications and the Contract Documents, and other mutually acknowledged informational materials shall perform everything required to be performed and to furnish a complete, fully operating work, and shall provide and furnish all labor, materials, necessary tools, expendable and non-expendable equipment and all transportation services required for the entire, proper, substantial completion of the Work, the cost of all of which shall be included in his bid. The CONTRACTOR shall make all requisite excavations and foundation preparation for constructing sidewalks, incidental drainage structures, and retaining walls. The CONTRACTOR shall where required, excavate and prepare subgrade for

pavement widening and replacement. The CONTRACTOR shall provide all signs, lighting, barricades, temporary construction fencing, flagmen and watchmen and make provisions necessary to protect and maintain buildings, fences, trees, shrubs, poles, existing utility fixtures, water courses, surface drains, or other structures in, on, across, or adjacent to the work and repair all damage done to them where and as required. The CONTRACTOR shall perform all backfilling, restore walks, grass plots, flowers, shrubs, trees, paved surfaces, etc., damaged or disturbed and clear away all rubbish and surplus materials. The CONTRACTOR shall put in complete and acceptable working order the items covered by the contract.

This Specification sets forth several items of Work or conditions, which are required as integral parts of the successful completion of the Project. All items discussed herein under General Provisions are considered incidental to the overall accomplishment of the Project and no separate payment shall be made therefore unless otherwise noted elsewhere in these specifications.

1.4 CONTRACTOR'S FACILITIES

1.4.1 Sanitary Facilities: The CONTRACTOR shall provide and maintain all necessary sanitary facilities at the site, in accordance with all applicable regulations, and shall properly remove same at completion of the Project.

1.4.2 Utilities: The obtaining of all utilities, which may be required for construction, shall be the responsibility of the CONTRACTOR.

1.5 CONTRACTOR'S FIELD OFFICE

A CONTRACTOR'S Field Office is not required for this project.

1.6 UTILITIES

The CONTRACTOR is cautioned to notify all utility companies prior to beginning construction operations.

It shall be the CONTRACTOR'S responsibility to locate all utilities, make appropriate arrangements regarding relocation, maintain utility service throughout the construction period, and make final relocations at the completion of the Work. The CONTRACTOR shall be responsible for any injury or damage to the existing utilities due to his operations whether shown or not shown in the plans. Where utilities are shown or indicated on the plans, the information given is in accordance with the best information in possession of the OWNER but is approximate only. The data is not warranted to be either complete or correct, and the CONTRACTOR shall assume all risks resulting from the conditions arising from the approximations shown.

The CONTRACTOR shall confer with the utility companies to inform them of the proposed construction schedule, verify the location and elevation of existing utilities and arrange for the relocation and adjustment of any facilities to avoid interference with the proposed construction. All such activities are to be performed under the direction of and with the approval of the ENGINEER.

When the various utility owners find it necessary to make adjustment to their lines where the CONTRACTOR is presently working, the CONTRACTOR is to move his operations to another area of work so as not to interfere in any way with the utility company's work.

Any utilities covered up or lost by the Construction operations of the CONTRACTOR shall be uncovered and found by the CONTRACTOR and the new Construction repaired and/or replaced as directed by the ENGINEER. No additional compensation will be allowed for such work nor shall any additional payment be allowed for the relocation and adjusting of any utility but shall be considered Incidentals to other work.

The CONTRACTOR shall make a concerted effort to prevent any disruption of utility services and if an unintended disruption occurs, the Contractor shall immediately and safely restore service. If disruption of any of the utility services covered in this section is unavoidable, it will be the responsibility of the CONTRACTOR to notify affected property owners. The CONTRACTOR shall also make every effort to restore said services before quitting work for the day. In the event this cannot be done, the CONTRACTOR shall provide temporary service to the property owner until permanent services can be restored.

1.7 TESTING

From time to time during the progress of the Work the ENGINEER may require that testing be performed to determine that materials provided meet the specified requirements.
The Lexington-Fayette Urban County Government will select a testing laboratory to perform the testing services. The cost of such services shall be the responsibility of the OWNER if testing reveals defective materials or Work, the cost of said testing will become the responsibility of the CONTRACTOR.

1.7.1 Codes and Standards: Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

1.7.2 Cooperation with the Testing Laboratory: Representatives of the testing laboratory shall have ready access to the work at all times. The CONTRACTOR shall provide facilities for such access in order that the laboratory may properly perform its functions.

1.8 INSTALLATION REQUIREMENTS

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as suggested by the respective manufacturers, unless otherwise specified herein or directed by the ENGINEER.

1.9 PROOF OF COMPLIANCE

Whenever the Contract Documents require that a product be in accordance with Federal Specifications, ASTM Designations, ANSI Specifications, and other associations' standards, the CONTRACTOR shall present a certification from the manufacturer that the product complies

therewith. When requested or specified, the CONTRACTOR shall submit supporting test data to substantiate compliance.

1.10 DUST CONTROL

The CONTRACTOR shall be responsible for minimizing the generation of dust resulting from his operations at all times. The CONTRACTOR shall be required to maintain all excavations, embankments, stockpiles, roads, permanent access roads, plant sites, waste areas, and all other work areas within or without the project boundaries free from dust, which would cause a hazard or nuisance to others. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods will be permitted to control dust. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

1.11 REPAIR OF DAMAGE

Any damage done to structures, fills, roadways, or other areas shall be repaired at the CONTRACTOR'S expense before final payment is made.

1.12 PROJECT EXTENT

The CONTRACTOR shall be responsible for satisfying himself as to the construction limits for the Project. The CONTRACTOR shall not establish Work, storage, or staging area outside the Project Limits, unless otherwise directed or approved by the ENGINEER.

1.13 WORKING HOURS

All Work on this Project shall be restricted to daylight hours, but may be further restricted by the ENGINEER if required; except emergency Work, such as any necessary pumping, which may require 24-hour operation. If the CONTRACTOR elects to work beyond the normal work week, he shall notify the ENGINEER of his intent as far in advance as possible.

1.14 GUARANTEE

The CONTRACTOR shall assume responsibility for all workmanship and materials for a period of one year from final payment. Any Work found to be defective due to failure to comply with the provision and intent of the Contract Documents shall be replaced at the CONTRACTOR I S expense.

1.15 PROPERTY CONSIDERATION

Materials having a salvage value shall remain the property of the OWNER. Salvageable materials rejected by the OWNER shall become the responsibility of the CONTRACTOR to dispose of in a proper manner subject to the approval of the ENGINEER.

1.16 BLASTING

No blasting allowed.

1.17 HAZARDOUS MATERIAL - GAS LINES

The CONTRACTOR is advised to exercise caution in his operations on this project, whether the plans indicate or do not indicate, the presence of any gas or hazardous material carrying lines.

1.18 DIVERSION OF STORM WATER

Appropriate measures must be taken to sandbag the necessary manholes and to pump drainage around the area under construction. The CONTRACTOR is responsible for developing a plan to divert storm drainage around the construction area with the approval from the ENGINEER. Materials, labor and all incidentals necessary to accomplish this diversion of storm drainage will be considered incidental to the contract.

1.19 SEWER SERVICE MAINTENANCE

This work shall consist of maintaining existing sanitary sewer service to residents in the area during construction. Sewage is to be maintained by whatever means necessary. No surcharge of manholes will be allowed.

Sanitary Sewer lines within the project area are subject to considerable inflow and infiltration of groundwater during or following rain events. CONTRACTOR should consider these periods of heavy flow when devising his sewer service maintenance plan and construction sequencing.

No separate payment will be made for Sewer Service Maintenance. Sewer Service Maintenance shall include all materials, equipment and labor necessary to maintain sewer service to residents during construction.

1.20 PROJECT SIGN

Prior to construction Project Signs shall be installed in accordance with the Sign Standard Drawings. The exact location shall be established prior to the beginning of the work and shall remain visible during the entire length of the Project. Two (2) signs shall be placed at each end of the street or the project work area. The Owner shall determine the exact number of signs and locations. After all Work is complete and prior to final inspection, the signs shall be removed and disposed of properly. The cost and installation of the Project Signs is incidental to the Project.

1.21 EDGE KEY

Where it is necessary to remove existing pavement, the CONTRACTOR will be required to furnish a neat edge along the pavement, obtained by sawing a neat line approximately one inch (1") deep in the surface before breaking the adjacent pavement away.

No direct payment will be made for Edge Key as this is considered incidental to the item for which the pavement removal is required.

TECHNICAL SPECIFICATIONS

SECTION 2 - CLEARING & GRUBBING

2.1 SCOPE

This item includes the Clearing & Grubbing in accordance with KYTC Standard Specification 202 of any trees, stumps, brush and bushes, existing concrete sidewalks, cement concrete and/or wet stone masonry, pipe removal, steps, fences, walls, manholes and structures within the disturbed limits. This includes removal of all pavements, curbs, gutters, concrete and bituminous driveways and concrete sidewalks that are to be replaced. Also included is the proper removal and disposal of such materials in a manner acceptable to the ENGINEER and in a manner not detrimental to the inhabitants of the area. The CONTRACTOR will be responsible for determining and complying with local ordinances regarding disposal and/or burning of such materials. Trees, shrubbery, fences, retaining walls, and other such items not specifically noted on the plans to be removed or saved in place, or not shown on the plans, but suspected of being within the project construction limits shall not be disturbed until so directed by the ENGINEER. Clearing & Grubbing shall not commence without approval of the ENGINEER.

Work shall not be performed outside the Disturbed Limits or existing vegetation outside these limits shall not be disturbed unless authorized by the ENGINEER.

Also included in this item will be the careful removal and stockpiling for pickup by the OWNER of all street and traffic signs, inlet grates, manhole frames and covers and other such salvageable and reusable items, not intended to be reset on the job.

Where existing shrubs, fences, planter boxes, etc. are to be removed from the public right of way for new construction under this Contract, and the property owner at this site wishes to replace and re-use same on his private property, the CONTRACTOR shall carefully remove and store on the property owner's property for his use after construction is completed. Payment for this work is to be included in the unit bid price for Clearing & Grubbing.

2.2 MEASUREMENT AND PAYMENT

Payment for Clearing & Grubbing will be a Lump Sum bid price which payment will be full compensation for all work required by this section.

TECHNICAL SPECIFICATIONS

SECTION 3 - CONSTRUCTION STAKING

3.1 SCOPE

The CONTRACTOR will furnish and be responsible for all staking, including the initial staking. The CONTRACTOR shall bear the cost of all staking necessary to control and complete the work according to the specifications to the lines and grades shown on the plans.

The survey centerline has been previously established. Should, prior to beginning work on this project, part or all of the centerline be destroyed, it will be the CONTRACTOR'S responsibility to re-establish this centerline from the reference points shown on the plans.
It will be the CONTRACTOR'S responsibility to establish all office projection centerlines shown on the plans. Should, during the course of construction of this project, any construction stakes be destroyed by others, it will be the CONTRACTOR'S responsibility to reset the stakes at no additional cost to the OWNER.

The CONTRACTOR'S staking party shall be under the general supervision of a **registered land surveyor**. It shall, be definitely understood that supervision of the resetting of construction staking is solely the responsibility of the CONTRACTOR and any errors or inaccuracies resulting from the operations of the construction staking party shall be corrected at no cost to the OWNER.

It will be the OWNER' S responsibility to make all measurements for determining final quantities to be used for basis of final payment on items of work.

3.2 MEASUREMENT AND PAYMENT

Payment for Construction Staking will be made on a Lump Sum unit bid price, which payment shall be full compensation for all work required by this section.

TECHNICAL SPECIFICATIONS

SECTION 4 - EXCAVATION & GRADING

4.1 SCOPE

The Work shall consist of the required removal and proper utilization or disposal of all excavated materials, and the shaping and finishing to the required lines and grades as shown on the plans. Excavation and grading will only be associated with sections 10 and 14.

4.2 SUMMARY

This Section includes all work; labor, machinary, disposal and replacement of unsuitable soil, removal of rock and any materials encountered to plan bottom depth for all earthwork related items. These items shall include, but are not limited to, earthwork procedures for drives, parking lots, pavements, building foundations, footings, caissons, building slabs, utility trenches, etc. No change in the contract price will be considered for any materials encountered and/or required to be removed, or replaced to achieve the earthwork requirements. The following is a list of the items which are included as a part of this work:

1. Preparing subgrades for, walks, pavements, lawns, and plantings.
2. Subbase course for concrete walks and pavements.
4. Base course for asphalt paving.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling trenches within roadway right-of-ways'.
7. Excavating and backfilling trenches for buried gas, water and electrical utilities
8. Excavating and backfilling for storm drainage and saniatry sewer (trench rock excavation is incidental to storm sewer installation.)
9. Placement of topsoil as shown on the plans.

4.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and subsequent disposal of materials removed.

1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer.
2. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 20 feet (6 m) in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, short-tip-radius rock bucket; rated at not less than 120-hp (89-kW) flywheel power with bucket-curling force of not less than 25,000 lbf (111 kN) and stick-crowd force of not less than 18,700 lbf (83 kN); measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp (157-kW) flywheel power and developing a minimum of 45,000-lbf (200-kN) breakout force; measured according to SAE J-732.

I. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce a topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth. Retain subparagraph above or below when satisfactory topsoil is not available on-site, or retain both as Contractor's option.

2. Topsoil Source: Amend existing surface soil to produce topsoil. Supplement with imported topsoil when required.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

L. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

M. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

4.4 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.
3. All reports are to be signed by a Professional Engineer with licences to practice in the state of this project.

4.5 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner or Engineer and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.
3. Contact utility-locator service for area where Project is located before excavating.
4. Locate existing underground utilites in areas of excavation work. If utilites are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
5. Should uncharted, or incorrectly charted, piping or other utilites be encountered during excavation, consult the utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilites in operation. Repair damaged utilites to the utility owner's satisfaction at no cost to the Owner.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

4.6 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, GC, SC and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. CL and CH with a dry density above 100, a Liquid Limit less than 50 and a Plastic Index under 35 will also be considered satisfactory.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups ML, MH, OL, OH, and PT, or a combination of these group symbols.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2. CL and CH with a dry density below 100, a Liquid Limit greater than 50 and a Plastic Index greater than 35 will be considered for use only by recommendation by the Geotechnical Engineer. Additional requirements for use of these types of soil may be required.

D. Backfill and Fill: Satisfactory soil materials. No shot rock may be used in the building area. Shot rock may be used on site as long as it is done in a manner which complies with the Rock Excavation Notes.

E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (38-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

4.7 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
2. Tear Strength: 40 lbf (178 N); ASTM D 4533.
3. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
4. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
5. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.

C. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 200 lbf (890 N); ASTM D 4632.
2. Tear Strength: 75 lbf (333 N); ASTM D 4533.
3. Puncture Resistance: 90 lbf (400 N); ASTM D 4833.
4. Water Flow Rate: 4 gpm per sq. ft. (2.7 L/s per sq. m); ASTM D 4491.
5. Apparent Opening Size: No. 30 (0.6 mm); ASTM D 4751.

4.8 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

4.9 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Pumps and other dewatering devices must utilize filters sufficient to remove silts and solids from water prior before sending it to the storm sewer system.

4.10 EXPLOSIVES

A. Explosives: shall not be permitted.

4.11 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials. Geotechnical information is provided, however the Contractor may conduct additional tests to alleviate anticipated unknows at his desire and expense.

4.12 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Drainage Structures Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended for bearing surface.

4.13 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated plans, elevations, and grades.

4.14 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches (300 mm) on each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

4.15 APPROVAL OF SUBGRADE

A. Notify Engineer when excavations have reached required subgrade.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

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

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer.

4.16 STONE BRIDGING

A. Scope. Where soft, undesirable soil material is encountered at or below the desired sub-grade elevation, undesirable material will be removed and/or bridged using #2 stone to develop a sufficient platform to support compaction of DGA. The depth and extent of the Work shall be determined based on conditions observed and performance of compaction equipment on subgrade. Work shall be as directed by the OWNER or ENGINEER.

B. Requirements. Undesirable soil material shall be removed and disposed of by the CONTRACTOR. The #2 stone shall meet the requirements of KYTC Section 805. Stone will be dumped or shoved into place and walked-in until support is developed for heavy equipment. The ultimate test will be ability to provide an adequate compaction platform for the DGA base.

C. Measurement and Payment. No direct measurements will be made. Payment for STONE BRIDGING will be based on weight tickets for #2 stone delivered and accepted for the Work. Payment will be at the bid unit price per ton for STONE BRIDGING, which shall be payment for all material, labor, plant, incidentals and operating costs necessary to construct and maintain STONE BRIDGING. Excavation, proof testing, and disposal of excavated material are incidental to STONE BRIDGING and will be included in the payment for STONE BRIDGING.

4.17 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.

4.18 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

4.19 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Surveying locations of underground utilities for record documents.
2. Inspecting and testing underground utilities.
3. Removing concrete formwork.
4. Removing trash and debris.
5. Removing temporary shoring and bracing, and sheeting.
6. Installing permanent or temporary horizontal bracing on horizontally supported walls.

4.20 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings; fill with concrete to elevation of bottom of footings.

C. Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

E. Coordinate backfilling with utilities testing.

F. Place and compact final backfill of satisfactory soil material to final subgrade.

G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

4.21 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

4.22 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

4.23 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 98 percent. The moisture content shall be maintained between minus 3, plus 1 percent of the optimal moisture.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent. The moisture content shall be maintained between minus 3, plus 1 percent of the optimal moisture.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 85 percent.

4.24 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1 inch (25 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

4.25 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place a layer of drainage fabric around perimeter of drainage trench as indicated. Place a 6-inch (150-mm) course of filter material on drainage fabric to support drainage pipe. Encase drainage pipe in a minimum of 12 inches (300 mm) of filter material and wrap in drainage fabric, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each course of filter material to 98 percent of maximum dry unit weight according to ASTM D 698.

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade. Overlay drainage backfill with one layer of drainage fabric, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each course of filter material to 98 percent of maximum dry density according to ASTM D 698.
2. Place and compact impervious fill material over drainage backfill to final subgrade.

4.26 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.
2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557. The moisture content shall be maintained between minus 3, plus 1 percent of the optimal moisture.
3. Shape subbase and base to required crown elevations and cross-slope grades.

4. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
5. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

4.27 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area, but in no case fewer than three tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

4.28 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

4.29 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Transport surplus satisfactory soil off the Owner's property.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property

4.30 BASIS OF PAYMENT

No direct payment is made for Excavation and Grading, as this cost is to be included in the unit bid price for items covered in other Sections of the Technical Specifications.

TECHNICAL SPECIFICATIONS

SECTION 5 - CONCRETE AND REINFORCING STEEL

5.1 SCOPE

The Work described by this Section consists of furnishing all materials and equipment, and performing all labor, for the complete construction of all concrete work except concrete pavements, including all work and appurtenances thereto, as shown or specified, or both. Work shall include the installation of all slabs, footings, headwalls, and the items to be built into the concrete work, and all other Work and appurtenances specified or required, or both for proper execution of the Work. All products to be built into concrete work shall be correctly positioned in the form work; positioning must be inspected and approved by the ENGINEER before concrete is placed.

5.2 APPLICABLE SPECIFICATIONS

5.2.1 Concrete: Concrete work shall conform to all requirements of the Building Code Requirements for Reinforced Concrete, ACI-318, latest edition of, and all codes and standards cited therein and the standard minimum specifications for ready-mixed concrete.
Concrete shall also be Class" A" and comply with Section 601 and 712 of the current edition of the KYTC Standard Specifications for Road and Bridge Construction.

5.2.2 Reinforcing Steel: Steel bar reinforcement shall conform to the requirements of ASTM A-:-615 "Deformed Billet Steel Bars for Concrete Reinforcement";
ASTM A-617 "Axle Steel Deformed Bars for Concrete Reinforcement". Reinforcing Steel shall also comply with Section 602 of the current edition of the KYTC Standard Specifications for Road and Bridge Construction.

5.3 BASIS OF PAYMENT

Payment for the placing of concrete and reinforcing steel shall not be a separate pay items, but shall be included in the unit bid of the specific structure being constructed.

5.4 CONCRETE SIDEWALK AND ENTRANCE PAVEMENT

5.4.1 This work shall consist of constructing, on a prepared sub grade, concrete sidewalks, handicap ramps, and entrance pavement at the elevations and to the lines and grades shown on the plans or established by the ENGINEER and in accordance with KYTC Standard Specifications for Road and Bridge Construction, Section 505 current edition.

The minimum thickness for all sidewalks and handicap ramps except at residential driveway entrances shall be four and one-half (41/2") inches. Apron and sidewalk at residential driveway entrances shall be six (6") inches minimum thickness. Concrete sidewalks shall be struck off by use of a screed, hand floated and brushed. Edges and division marks shall be finished in a neat and workmanlike manner by use of the proper concrete finishing tools. Division joints in sidewalks

shall be three-fourths (3/4 ") inch in depth at four foot (4') intervals. Expansion joints shall be placed at thirty-two (32') feet intervals or as otherwise directed.

Expansion joint material shall be an approved quality one-half (1/2") inch in thickness and shall extend entirely and continuously through the concrete. The unit bid price for the item involved shall include the cost of expansion joint material in place. All expansion joint material shall be trimmed to conform to the surface of the concrete.

5.4.2 Measurement and Payment. Handicap ramps will be included and paid for under "41/2" Concrete Sidewalk". Residential entrances including apron, sidewalk and concrete areas beyond the sidewalk will be included and paid for under" 6" Inch Concrete Sidewalk and Entrances".

Payment will be made at the unit bid price per square yard of "4-1/2" Concrete Sidewalk" or "6" Concrete Sidewalk and Entrances," complete and accepted in place in the final work. Payment shall be full compensation for all labor, materials and incidentals necessary to complete the work.

5.5 CONCRETE CURBS AND GUTTERS

5.5.1 This work shall consist of constructing one prepared subgrade, combination curbs and gutters at the elevations and to the lines and grades shown on tl1e plans to tl1e required section and depth on a firm base as approved by the OWNER or ENGINEER and in accordance with the LFUCG Standard Drawings.

5.5.2 Measurement and Payment. Payment will be made on the accepted quantities of LFUCG Curb & Gutter Type I or LFUCG Header Curb at the unit bid price per linear foot. Payment shall be full compensation for all materials, equipment and labor necessary to complete the work.

5.6 CONCRETE PAVEMENT AND SIEWALK REMOVAL & REPLACEMENT

5.6.1 When it is necessary to remove portions of the existing concrete sidewalks and entrance pavements and to match the remaining portions with new concrete it shall be done as follows: Existing concrete sidewalks and entrance pavements will be removed to tl1e nearest transverse joint or division mark beyond tl1e matching point indicated on the plans. The existing concrete shall be sawed by an approved concrete saw. In tl1e absence of a transverse joint or division mark the sawing shall be done as directed by the OWNER or ENGINEER. It will not be permissible to place new concrete against the ragged edge of concrete left by removing existing concrete with air hammers, hand tools, or at broken division lines.

5.6.2 Measurement and Pavement. No direct payment is made for concrete sidewalk removal or concrete entrance pavement removal or sawing, as this cost is to be included in the unit bid price for Clearing and Grubbing.

5.7 CONCRETE CURB REMOVAL, CONCRETE DRIVEWAY REMOVAL, CONCRETE SIDEWALK REMOVAL, CATCH BASIN REMOVAL, PIPE REMOVAL AND RETAINING WALL REMOVAL

5.8.1 All existing curb, driveway entrances, sidewalks, catch basins, pipe and retaining wall removal noted on the plans shall be removed by the CONTRACTOR and disposed of off-site as approved by the OWNER or ENGINEER.

5.8.2 Measurement and Payment. No direct payment will be made for this work, as this cost is to be included in the unit bid price for Clearing and Grubbing,

TECHNICAL SPECIFICATIONS

SECTION 6 - RECONSTRUCTING & ADJUSTING MANHOLES

6.1 SCOPE

This item shall include reconstructing with new standard manhole frames and covers or adjusting manholes to the required line and elevation in accordance with Section 710 of the KYTC Standard Specifications for Road and Bridge Construction, current edition.
Frames and covers shall comply with LFUCG Standard Drawings 103.0 and 221.0 as appropriate. New frames shall be the adjustable type, set to their lowest setting, and lubricated per manufacturer's instructions.

6.2 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

A. Except where shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate 4 inches below existing grade in an unpaved non-traffic area except in a residential yard and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade as described hereinafter in paragraphs B and C of this article.

B. When a manhole is located in an unpaved non-traffic area other than in a residential yard, the frame and cover shall be adjusted to an elevation 3 inches to 5 inches above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 3 inches to 5 inches above existing grade shall be accomplished by the use of precast concrete or cast iron adjusting rings. If field changes have resulted in the completed manhole invert to be greater than the invert shown on the Drawings and the cover higher than 5 inches above existing grade, then the top of the eccentric cone, when used, or the top of the barrel section, when used, shall be trimmed down so that the manhole cover, after installation, is no greater than 5 inches above existing grade at the center of the cover. The area around the adjusted frame and cover shall be filled with the required material, sloping it away from the cover at a grade of 1 inch per foot.

C. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete or cast iron adjusting rings. The adjusted cover shall conform to the elevation and slope of the surrounding area. If field changes have resulted in the installed manhole invert elevation to be so much higher than the invert elevation shown on the Drawings that the top of the eccentric cone, when used, or the top of the flat slab, when used, is less than the thickness of the frame and cover 7 inches from the grade of the surrounding area, then the top of the cone or barrel section shall be trimmed down enough to permit the cover, after

installation, to conform to the elevation and slope of the surrounding area. After installation, the inside and outside surfaces shall receive a waterproofing bitumastic coating.

1 If resurfacing of the street in which sewers are laid is expected within twelve (12) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

6.3 ADJUSTING SECTIONS

Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded.

6.4 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming to the required elevations set forth hereinbefore. Frames shall be set concentric with the top of the concrete and in a full bead of butyl mastic sealant so that the space between the top of the masonry and the bottom flange of the frame shall be completely watertight.

B. Manhole covers shall be left in place in the frames on completion of other work at the manholes.

6.5 VACUUM TESTING (ASTM C1244)

A. Scope

1. This test method covers procedures for testing precast concrete manhole sections when using the vacuum test method to demonstrate the integrity of the installed materials and the construction procedures. This test method is used for testing concrete manhole sections utilizing mortar, mastic, or gasketed joints.

2. This test method is intended to be used as a preliminary test to enable the installer to demonstrate the condition of the concrete manholes prior to backfill. It may also be used to test manholes after backfilling; however, testing should be correlated with the connector supplier.

3. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

4. This test method is the companion to metric Test Method C 1244M; therefore, no SI equivalents are shown in this test method.

B. References, ASTM Standards:

1. C 822 Terminology Relating to Concrete Pipe and Related Products.

2. C 924 Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.

3. C 969 Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.

C. Terminology

For definitions of terms relating to manholes, see Terminology C 822.

D. Summary of Practice

All lift holes and any pipes entering the manhole are to be plugged. A vacuum will be drawn and the vacuum drop over a specified time period is used to determine the acceptability of the manhole.

E. Significance and Use

This is not a routine test. The values recorded are applicable only to the manhole being tested and at the time of testing.

F. Preparation of the Manhole

1. All lift holes shall be plugged.

2. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

G. Procedure

1. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.

2. A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.

Minimum Test Times for Various Manhole Diameters (seconds)									
Depth (ft)	Diameter (inches)								
	30	33	36	42	48	54	60	66	72
1	1	2	2	2	2	3	3	4	4
2	3	3	4	4	5	6	7	7	8
3	4	5	5	6	7	9	10	11	12
4	6	6	7	9	10	12	13	15	16
5	7	8	9	11	12	14	16	18	20
6	8	10	11	13	15	17	20	22	24
7	10	11	12	15	17	20	23	26	28
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	28	34	40	46	52	58	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	58	65	72	81
22	31	33	39	46	55	64	72	79	89
24	33	36	42	51	59	69	78	87	97
26	36	39	46	55	64	75	85	94	105
28	39	42	49	59	69	81	91	101	113
30	42	45	53	63	74	87	98	108	121

3. The manhole shall pass if the time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury meets or exceeds the values indicated in the following table:

4. If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

5. Use or failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing, (see Practice C 969), or other means.

H. Precision and Bias

No justifiable statement can be made either on the precision or bias of this procedure, since the test result merely states whether there is conformance to the criteria for the success specified.

6.6 BYPASS PUMPING

The contractor shall provide all labor, supervision, tools, equipment, appliances, and materials to perform all operations in connection with pumping sewage and wet weather flows around pipe segments, to prevent sewage overflows and provide reliable sewer at all times. The Contractor shall

provide and maintain adequate pumping equipment, force mains and other necessary appurtenances. The contractor shall have backup pumps, force mains and appurtenances ready to deploy immediately. The Inspector shall approve appurtenances and discharge point. The Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows. Any spillage, backups or overflows is the sole responsibility of the Contractor.

6.7 MEASUREMENT AND PAYMENT

No direct payment will be made for this work, as this is to be included in the unit bid price for manhole construction.

TECHNICAL SPECIFICATIONS

SECTION 7 - ASPHALT PAVEMENTS

7.1 ASPHALT CONCRETE SURFACE AND BASE

7.1.1 This work shall consist of constructing one or more courses of asphalt concrete surface or base on a prepared base in accordance with KYTC Standard Specifications and in reasonably close conformity with the lines, grades, thickness and typical sections shown on the plans or established by the ENGINEER.

The asphalt surface or base shall be composed of a mixture of aggregate, filler when required and asphalt material.

7.1.2 Mixtures: See KYTC Sections 402 through 403.
Asphalt Surface shall be Class 1, 0.38D PG64-22
Asphalt Base shall be Class 1, 0.75D PG64-22

7.1.3 Basis of Payment: The accepted quantities measured in accordance with Sections 109 and 402.04 of the KYTC Standard Specifications for Road and Bridge Construction, current edition will be paid for at the unit bid price as follows, which payment shall be full compensation for all work required by this section.

Payment will be made under:

Asphalt Concrete Surface	Per Ton
Asphalt Concrete Base	Per Ton
Asphalt Mixture for Leveling and Wedging	Per Ton

7.2 ASPHALT TACK COAT

7.2.1 This work shall consist of preparation of existing bases or surfaces, and the application thereto of liquid asphalt material prior to the placing of covering courses of asphalt mixtures or treatments. Asphalt Tack Coat shall consist of the application of liquid asphalt material to the surface of concrete or brick pavements and bases, to existing asphalt surfaces, and when necessary, to newly constructed asphalt courses.

7.2.2 Materials: The asphalt material shall be either SS-1 or SS-1H and shall meet the requirements of KYTC Standard Specifications, current edition, Section 806. All equipment required for performance of this work shall be approved before construction is started and shall be maintained in a satisfactory operating condition.

The CONTRACTOR shall provide hand brooms and other small tools and equipment essential to the completion of the work in addition to a mechanical broom or sweeper, asphalt heating equipment and a pressure distributor as needed.

7.2.3 Method of Measurement: When an approved cutback asphalt is furnished for the tack coat, the actual quantity will be measured for compliance. Asphalt materials for tack coat will be weighed in accordance with the requirements for KYTC Standard Specifications Section 109.

7.2.4 Basis of Payment: No direct payment will be made for asphalt material for tack. This work as this is to be included in the unit bid price for asphalt surface.

7.3 DENSE GRADED AGGREGATE BASE

7.3.1 This base course shall consist of graded aggregate and water mixed with or without an admixture, placed on a prepared sub grade, and shaped and compacted to the lines, grades and cross section shown on the plans and as directed by the Engineer to maintain access to driveways, etc. and for Maintenance of Traffic.

7.3.2 Materials: Materials shall meet the requirements of the following KYTC Standard Specifications, current edition Section:

Aggregate	805
Calcium Chloride	825

Water used in the mixture will be subject to approval by the ENGINEER on the project.

When approved by the ENGINEER, the aggregate may be produced by blending 2 or more aggregate sizes. When blending is permitted, the separate sizes shall be fed uniformly into the mixer and a synchronized proportioning system between the feeders shall be provided.

7.3.3 The subgrade shall be prepared in accordance with KYTC Standard Specifications, current edition Section 207, and shall be maintained free from irregularities.

It is intended that the dense-graded aggregate base shall be completely covered with the specified pavement courses before the work is suspended for the winter months. The CONTRACTOR shall make every effort to accomplish this objective. When the dense graded aggregate base course is not completely covered with the specified pavement courses, the OWNER or ENGINEER will then determine the extent of any further work necessary to protect and maintain the uncompleted work during -the winter months and until the beginning of spring paving operations. When extra materials, methods, and construction techniques, not part of the specified contract, are determined to be necessary to protect, maintain, and repair any portion of the uncompleted work, the cost of such extra materials, methods, and techniques shall be borne by the CONTRACTOR.

7 .3.4 The requirements of Kentucky Department of Highways (KYTC) Standard Specifications, Section 302, apply with the following changes:

1) Control strips will not be required or utilized for compaction control.

2) Test sections and target density, as prescribed in paragraph 303.07, will not be established.

3) Density measurements will be made at locations designated by the OWNER or ENGINEER or his/her representative.

4) Additional tests requested by the CONTRACTOR will be at the CONTRACTOR'S expense.

5) The average of dry density measurements in a lift shall be equal to or greater than 144 pounds per cubic foot (pct). No individual measurement shall be less than 140 pcf.

6) In the event the dry density measurements are not met, laydown operations will be stopped in the substandard area identified by the ENGINEER or his/her representative. The CONTRACTOR will either continue compaction effort or rework the designated section until the requirements for dry density are satisfied.

7.3.5 Method of Measurement: Water used to moisten the subgrade prior to placing base, in mixing the base material, and to maintain moisture during compaction and maintenance of the base will not be measured for separate payment, but will be considered incidental to DGA Base. The plant-mixed materials will be weighed in accordance with KYTC Standard Specifications, current edition Section 109.

7.3.6 Payment: The accepted quantities thus measured will be paid for at the unit bid price of "Dense Graded Aggregate" which payment shall be full compensation for all work required by this Section.

Payment will be made under:

Dense Graded Aggregate	Per Ton

7.4 STONE BRIDGING

7 .4.1 Where soft, undesirable soil material is encountered at or below the desired sub grade elevation, undesirable material will be removed and/or bridged using #2 stone to develop a sufficient platform to support compaction of DGA. The depth and extent of the Work shall be determined based on conditions observed and performance of compaction equipment on subgrade. Work shall be as directed by the ENGINEER.

7.4.2 Requirements. Undesirable soil material shall be removed and disposed of by the CONTRACTOR. The #2 stone shall meet the requirements of KYTC Section 805.
Stone will be dumped or shoved into place and walked in until support is developed for heavy equipment. The ultimate test will be the ability to provide an adequate platform for placement and compaction of the DGA base. Geotextile Fabric Type IV meeting the requirements of KYTC Section 843 shall be placed between the prepared subgrade and the No.2 Stone. All costs associated with furnishing and placing Geotextile Fabric Type IV shall be considered incidental to the payment for "Stone Bridging."

7 .4.3 Measurement and Payment. No direct measurements will be made.

Payment for "Stone Bridging" will be based on weight tickets for #2 stone delivered and accepted for the Work. Payment will be at the bid unit price per ton for" Stone Bridging", which shall be payment for all material, labor, plant, incidentals and operating costs necessary to construct and maintain "Stone Bridging." Excavation, proof testing, and disposal of excavated material, furnishing and placing Geotextile Fabric Type IV are incidental to "Stone Bridging" and will be included in the payment for "Stone Bridging."

TECHNICAL SPECIFICATIONS

SECTION 8 - REMOVE & RESET FENCE OR REMOVE & REPLACE FENCE

8.1 SCOPE

Where it is necessary to remove existing fences from the construction limits, the intent of this work shall consist of removing and resetting the fence or removing and replacing the fence as indicated on the plans or as directed by the OWNER.

If the OWNER or ENGINEER determines at the time of removal that the existing fence is to be replaced, the CONTRACTOR shall replace it with fence of the same type and height as existing.

The removing and resetting or replacing of fences shall conform to Section 722 of the current edition of the KYTC Standard Specifications for construction requirements. Posts necessary for replacement posts shall be of the same type as exists in the original fence and shall comply with applicable requirements specified. All other materials shall meet the requirements specified in the following sections of the KYTC Standard Specifications.

Chain Link Fencing Materials 817

The CONTRACTOR may select any class of concrete specified in KYTC (Section 601).

8.2 RESETTING FENCE

The CONTRACTOR will be required to reset the fence to the location designated, using material from the original fence, and he shall leave all fences in as good condition as before removal. All posts shall be reset using the same type of construction that was used on the original fence, and any new material necessary to set these posts in the manner used on the original fence shall be furnished by the CONTRACTOR. Where any posts are set in concrete, the fence shall be reconstructed in the same manner, the CONTRACTOR furnishing the concrete. Reconstructed fences shall be true to line and vertical. All wires shall be taut and well stapled, and when resetting is finished, the fences shall present a workmanlike appearance. Gates shall be removed and restored for service at the new location. Fence and/or gates, which are damaged during moving or resetting, shall be repaired or replaced at the CONTRACTOR'S expense.

Should the owners or lessees of the property desire to improve any fence or portion thereof that is to be reset, and the said owners or lessees agree to furnish the CONTRACTOR the necessary materials similar in character to that in the original fence, the CONTRACTOR will be required to rebuild, repair, and reset such fence, using the material furnished by the owners or lessees in lieu of the original material.

8.3 DISPOSAL OF FENCE

The CONTRACTOR shall remove fence as indicated on the plans or as directed by the OWNER or ENGINEER and make satisfactory disposal of the materials off site.

8.4 REMOVING & REPLACING FENCE

The CONTRACTOR shall remove the fence as described above. The CONTRACTOR shall replace the fence in accordance with the requirements of KYTC Section 722.

8.5 METHOD OF MEASUREMENT

Removing and resetting fence, including gates will be measured in linear feet along the top of the fence and gates from outside to outside of end posts for each continuous run complete and accepted. Removing and replacing fence, including gates, will be measured in linear feet along the top of the fence and gates from outside to outside of end posts for each continuous run complete and accepted.

8.6 BASIS OF PAYMENT

The accepted quantities of fence, including gates, removed and reset will be paid for at the contract unit price per linear foot. The accepted quantities of fence, including gates, removed and replaced will be paid for at the contract unit price per linear foot. Payment will be full compensation for all materials, equipment, and labor necessary to complete the work.

Payment will be made under:

Removing & Resetting Fence	Linear Foot
Removing & Replacing Fence	Linear Foot

TECHNICAL SPECIFICATIONS

SECTION 9 - LANDSCAPING

SCOPE

The Work shall consist of the installation of all plant material as specified on the construction documents.

9.1 SUBMITTALS

Product certificates signed by manufacturers certifying that their products comply with specified requirements.

Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.

1. Analysis of existing surface soil.
2. Analysis of imported topsoil.

Planting schedule indicating anticipated dates and locations for each type of planting.

9.2. QUALITY ASSURANCE

Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.

Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.

9.3 DELIVERY, STORAGE, AND HANDLING

Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

Seed: Deliver seed in original sealed, labeled, and undamaged containers.

9.4 PROJECT CONDITIONS

Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required.

Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.

9.5 COORDINATION AND SCHEDULING

Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

9.6 WARRANTY

General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

Special Warranty: Warrant the following living planting materials for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.

Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.

Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

9.7 LAWN MAINTENANCE

Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

Seeded Lawns: 60 days after date of Substantial Completion.

When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.

Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.

Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches (100 mm).

Water lawn at the minimum rate of 1 inch (25 mm) per week.

Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.
Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.

Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of lawn area.

9.8 MATERIALS

GRASS

Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.

Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on Schedules at the end of this Section.

Payment. Payment will be made on the accepted quantity used and paid for at the unit bid price. Payment shall be full compensation for all materials, equipment and labor necessary to complete the work.

Payment will be made for:

Grass Seed	Per Ton

TOPSOIL

Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.

Topsoil Source: Reuse surface soil on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

Topsoil Source: Import topsoil from off-site sources. Obtain topsoil from naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs or marshes.

Topsoil Source: Amend existing surface soil to produce topsoil. Supplement with imported topsoil when required.

Payment: No direct payment will be made for this work as this is to be included in the unit bid price for Grass.

SOIL AMENDMENTS

Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 (2.36 mm) sieve and a minimum 75 percent passing a No. 60 (250 micrometer) sieve.

Provide lime in the form of dolomitic limestone.

Aluminum Sulfate: Commercial grade, unadulterated.

Sand: Clean, washed, natural or manufactured sand, free of toxic materials.

Perlite: Horticultural perlite, soil amendment grade.

Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.

Peat Humus: For acid-tolerant trees and shrubs, provide moss peat, with a pH range of 3.2 to 4.5, coarse fibrous texture, medium-divided sphagnum moss peat or reed-sedge peat.

Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

When site treated, mix with at least 0.15 lb (2.4 kg) of ammonium nitrate or 0.25 lb (4 kg) of ammonium sulfate per cu. ft. (cu. m) of loose sawdust or ground bark.

Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

Herbicides: EPA registered and approved, of type recommended by manufacturer.

Water: Potable.

Payment: No direct payment will be made for this work as this is to be included in the unit bid price for Grass.

FERTILIZER

Bonemeal: Commercial, raw, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.

Superphosphate: Commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.

Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:

Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

Payment: No direct payment will be made for this work as this is to be included in the unit bid price for Grass.

9.9 INSTALLATION

EXAMINATION

Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

PLANTING SOIL PREPARATION

Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.

For lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

Mix lime with dry soil prior to mixing fertilizer. Prevent lime from contacting roots of acid-tolerant plants.

Apply phosphoric acid fertilizer, other than that constituting a portion of complete fertilizers, directly to subgrade before applying planting soil and tilling.

CLEANUP AND PROTECTION

During landscaping, keep pavements clean and work area in an orderly condition. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

DISPOSAL OF SURPLUS AND WASTE MATERIALS

Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

SEED MIXTURES SCHEDULE

Seed shall be a blend of Turf Type Tall Fescue with perennial and annual rye:

Provide a minimum of two types of Turf Type Fescue from the following list with Falcon II, Houndog 5, Finelawn Petite, and Crossfire II.

Provide either Calypso II or Manhattan II type of Perennial Ryegrass.

	Percent by Weight
Turf Type Tall Fescue	70
Perennial Ryegrass	20
Annual Ryegrass	10

Apply mix at a rate of 8 lbs./1000 sq. ft., fertilize with 3 lbs. each of nitrogen, phosphate and potash per 1000 sq. ft. Hydro-mulch with 50 lbs. wood fiber per 1000 sq. ft. and 150 gallons per 1000 sq. ft.

9.10 SOD

Work under this Section shall be in conformance to Kentucky Department of Highways Standard Specifications Section 212 and shall include all labor, materials, equipment, and incidentals necessary to complete the Work. Fertilizer (10-10-10) and agricultural lime will be incorporated into a 3" deep sod bed and applied at a rate of 28 lbs./1,000 sq. ft. and 100 lbs./1,000 sq. ft., respectively. Sodding shall be done with Kentucky Bluegrass, Fescue, or other species approved by the ENGINEER and available at the time of placement. Sod shall be kept moist for a minimum of two weeks. The desires of the owner and the species currently being used should be considered.

Accepted quantities for Sodding will be paid for at the Contract Unit Price as quoted (which shall be full compensation for all Work under this Section) and paid per square yard of Sodding satisfactorily placed. All labor, materials (other than the sod), and equipment shall be incidental to Sodding.

TECHNICAL SPECIFICATIONS

SECTION 10 - STORM DRAINAGE PIPEWORK

10.1 SCOPE FOR RCP

This work shall consist of furnishing, bedding, laying, and jointing of all storm sewer pipe shown on the Construction Plans or otherwise required by the Contract Documents. The work shall also include the trenching and backfill, removal and relocation of disturbed utilities, and the necessary pavement and sidewalk repairs. Repair of concrete curb and entrances will be covered under separate sections. The CONTRACTOR shall limit active pipe installation to assure clean up following such work. This Work includes new storm drainage lines and all connections to new and existing manholes and pipes.

10.2 MATERIALS FOR RCP

All pipe strength shall be Class III is the minimum acceptable class for each type of pipe. Any pipe found defective, or otherwise not meeting the Specifications shall be rejected and replaced by pipe meeting these Specifications at no additional cost to the OWNER.

The CONTRACTOR shall furnish three copies of the supplier's certification to the ENGINEER stating that pipe: materials were manufactured, sampled, tested and inspected in accordance with the standards listed in this Section and have been found to meet those requirements.

10.2.1. Reinforced Concrete Pipe: Circular reinforced concrete pipe shall meet the requirements of ASTM C 76, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Storm Pipe. Unless shown otherwise on the Plans or in the Contract Documents, Class III pipe shall be used.

Rubber and plastic joints shall meet the requirements of AASRTO M 198, Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets, for Type A (Rubber Gaskets), Type B (Flexible Plastic Gaskets) gaskets, or Forsheda Rubber Gaskets. Bituminous mastic joint sealing material shall meet the requirements of KYTC Standard Specifications Section 807.02.04, Joint Sealer for Rigid Pipe, except that asbestos fibers shall not be allowed as filler.

10.2.2 Bedding and Backfill: Bedding materials shall be provided as indicated on the Plans and LFUCG's Standard Drawings. All back fill under pavement shall be No. 9 Crushed Limestone to within one (1) foot of the surface of the pavement, and then the design pavement sections shall be utilized. All crushed limestone stone and DGA shall conform to Section 805 of the Kentucky Department of Highways (KYTC) Standard Specifications, current edition.

10.2.3 Temporary Silt Fence: Use either hardwood or steel greater that four feet in height. For hardwood, provide a minimum 1 ½" by 1 ½" cross section that is straight enough to provide a fence without noticeable misalignment. For steel, provide a 1 ¼" by 1" T-section with projections to fasten wire and fabric in position.

Provide fabric with a minimum height of 2 feet 8 inches. Require at least 6 horizontal wires spaced 6 ¼ inches or closer with the top and bottom wires 0.134 inch or larger and all other wires 0.1 inch or larger. Require 0.1 inch or larger vertical wires spaced 12 inches or closer.

Provide geotextile fabric with a height of 3 feet.

Use No. 9, one-inch long wire staples and/or fabric ties.

10.3 EXECUTION FOR RCP

In all operations such as placing the pipe, jointing, bedding and backfilling, care shall be exercised and it shall be the CONTRACTOR'S responsibility to see that pipes are not damaged during transportation, unloading, or placement during compaction of the backfill by movement of excessively heavy equipment over the backfill; or any other force that may cause damage.

10.3.1. Trenching

Excavation and grading. shall be done in a neat and workmanlike manner to form smooth and uniform subgrades and surfaces for all subsequent operations and once the surfaces have been shaped to the proper template and compacted to the satisfaction of the ENGINEER and in accordance with the current edition of the Kentucky Department of Highways Standard Specifications, it shall be maintained in such condition until covered by subsequent construction operations.

Material removed shall include excavation to the designated depths, transporting of removed materials from points of removal to points of formal use, disposal of surplus materials, and the shaping and finishing of all areas to the required lines and grades as shown on the Drawings.

No blasting will be allowed, only mechanical methods of removal will be allowed. Surplus material will become the responsibility of the CONTRACTOR to dispose of off the project limits at a site acquired by the CONTRACTOR at no expense to the OWNER and approved by the OWNER or ENGINEER.

Material removal carried below the indicated depths, except when directed by the OWNER or ENGINEER, shall be replaced with material satisfactory to the OWNER or ENGINEER. Additional payment will not be necessitated thereby. All areas of fill shall be constructed to the lines and grades indicated on the Drawings, unless otherwise directed by the OWNER or ENGINEER.

Classification. Without regard to the materials encountered, all excavation shall be unclassified.

Trench Dimensions. No more than 300 feet of trench shall be opened at any time in advance of the pipe, nor shall more than 25 feet be left unfilled overnight. Excavations for pipe shall display a width between the minimum and maximum allowable width at a level one (1)-foot above the outside top of pipe, as shown on the Plans and LFUCG's Standard Drawings.

Sheeting and Bracing. Sheeting and bracing as may be required to safely support the sides of excavations shall comply with current OSHA requirements and the safety precautions as outline in current and accepted safety manuals, such as "Associated General Contractors Manual of Accident Prevention in Construction." When sheeting and bracing are necessary to prevent caving of the walls of excavation and to safeguard the workmen, the excavations shall be dug to such widths that proper allowance is made for the space occupied by the sheeting and bracing.

The CONTRACTOR shall perform the additional excavation required and furnish and put in place the necessary sheeting and bracing and shall remove the same as the excavation is filled.

Saw Cuts. Prior to excavating beneath pavement, sidewalks, curbs, etc., pavement or concrete shall be saw cut. The final saw cut shall be set back at least twelve inches beyond the edge of the excavation and bridged with concrete in accordance with LFUCG Standard Drawings. Trench backfill shall include concrete bridge as shown in the LFUCG Standard Drawings.

Excess Material. Excess material generated from the trench excavation and not utilized, as backfill shall be properly disposed of off-site by the CONTRACTOR.

10.3.2. Cradle and Encasement

Cradle and Encasement shall be of crushed stone and shall be installed as specified and within the limits shown on the Plans or directed by the ENGINEER.

Crushed Stone Cradle. Crushed No.9 stone cradles shall mean the placement of crushed stone from the subgrade level (six-inches below the outside of the pipe) up to the springline of the pipe. The crushed stone shall be deposited in the trench to grade, allowing for the thickness of the pipe wall. Bell holes shall be dug to relieve the bells of all concentrated loads and to provide uniform support throughout the pipe section. For larger pipes, the crushed stone shall be shoveled and shovel-sliced beneath the haunches of the pipe to assure uniform support.

Crushed Stone Encasement. Crushed No.9 stone encasement shall mean the placement of additional crushed stone above the crushed stone cradle to a level at least 12-inches above the outside top of the pipe. Crushed No.9 stone is required under pavement and elsewhere as indicated on the drawings. The additional stone shall be placed in such manner to prevent damage to the pipe.

10.3.3. Pipe Installation

Inspection and Handling. All pipes shall be inspected on delivery and such pipe sections that do not conform to these Specifications and which are not suitable for use shall be rejected and immediately removed from the work site. Equipment used to handle, lay, and joint pipe shall be so used to prevent damage to the pipe and its jointing materials. All pipe and fitting shall be carefully handled and lowered into the trench. The pipe shall not be rolled, dropped, or thrown into the trench. Damaged pipe or jointing material shall not be installed.

Pipe Laying and Jointing. The laying of pipe shall begin at the lowest point and proceed upstream with the bell or groove ends pointing upstream. Prior to making pipe joints, all joint surfaces shall be clean and dry and free from gravel or other extraneous materials.
All necessary lubricants or adhesives shall be used as recommended by the pipe manufacturer. Suitable means shall be used to force the spigot or tongue end of the pipe the proper distance into the bell or groove end without damage to the pipe and its jointing materials and without disturbing previously laid pipe sections. Special care shall be taken to ensure that the pipe is solidly and uniformly cradled or encased in accordance with these Specifications. No section of pipe shall be brought into position for jointing until the preceding section has been bedded and secured in place.

Line and Grade. Each section of pipe shall be checked for vertical and horizontal alignment immediately after being laid. All adjustments to line and grade must be made by scraping away or filling in under the barrel of the pipe and not be wedging or blocking up any portion of the pipe or striking the pipe in an effort to drive it down.

Protection of Installed Pipe. As the work progresses, the interior of the pipe shall be protected from and cleaned of all dirt, cement, extruded joint materials, debris, and other extraneous material. Wherever pipe laying is stopped for any significant length of time, such as at the end of the workday, the unfinished end shall be protected from displacement, floatation, cave-in, and in-wash of soil or debris. A suitable temporary tight fitting plug, stopper or bulkhead shall be placed in the exposed bell or groove end of the pipe.

Water shall not be allowed to rise in the excavation until the joint material and/or concrete cradle or encasement has hardened and cannot be damaged by the water. Particular case shall be used to prevent disturbance or damage to the pipe and the joints during backfilling or at any other time. No walking or working over the pipe, except as necessary for placing and compacting backfill or operating compaction equipment directly over the pipe shall be allowed until a minimum of 24-inches of cover over the outside top of the pipe has been placed. Mechanical compaction in this zone shall be with manual pneumatic tampers or other hand-operated methods, which will not damage the pipe.

10.3.4. Backfill

The pipe trench shall be backfilled utilizing the material types and zones shown on the Plans and LFUCG's Standard Drawings. No.9, No. 57, or No. 78 shall be placed in 12inch maximum lifts and compacted with two passes of a vibratory plate compactor. Dense graded aggregate shall be compacted to 84 percent solid volume. The surface should be raked or lightly roughened. Where the Standard Drawings require a concrete cap, it shall be constructed according the KYTC Section 501 for consolidated unfinished concrete.

Repair of Surface Features. After completion of storm sewer pipe construction, surface features such as sod, street pavement, sidewalks, curbs, etc., shall be restored to at-least the condition that existed prior to construction. Finished grades of pavement and sidewalks shall match existing grades. Pavement restoration shall meet the requirements of LFUCG Standard Drawings. Concrete thickness and reinforcement shall conform to the existing sections. The edges of concrete repairs

shall be turned down 12 inches and asphalt or other approved expansion joint material shall be placed between the existing and new concrete.

10.3.5. Inspection

Contractor shall perform and/or provide for a TV inspection of all lines. The TV inspection shall be directed by the Engineer. TV inspection shall be performed in accordance with the Technical Specification 21. For storm lines in the street, TV inspection is to be done after fill has been in place at least 30 days and to be done before final surface is placed on street. The following closed circuit television inspectors meet LFUCG's guidelines.

Leak Eliminators	(859) 875-2995
Pipe Eyes	(859) 987-2529
JGK Testing and Supply	(512) 860-1400

10.4 MEASUREMENT AND PAYMENT FOR RCP

Storm Sewer Pipe. Accepted quantities under this Section will be paid for at the Contract Unit Price per linear foot for the appropriate system. No allowances will be made for fittings. Payment as specified above shall be considered full compensation for furnishing, transportation, and installation, including excavation, backfill material, removal and relocation of disturbed utilities, backfilling and pavement, pavement saw cuts, concrete bridge, sidewalk repairs, sod, fertilizer, and lime, silt fence, and all necessary material, labor equipment and incidental necessary to complete the work as required. Payment for concrete curb and entrances will be made under separate item.

10.5 SCOPE FOR HDPE STORM SEWER

Work under this Section shall include all labor, excavation, materials, equipment, bedding and backfilling in accordance to the Plans, Contract Documents and Specifications and all incidentals necessary to place HDPE Storm Sewer to the sizes indicated. Only ADS N-12 or Hancor Sure-Lok HDPE materials are approved at this time. Submit in writing the proposed Manufacturer's name at time of bid or at pre-construction meeting. The CONTRACTOR shall be certified by the Pipe Manufacturer to install HPPDE pipe and provide proof thereof. All pipe delivered to the site shall be certified through the Plastic Pipe Institute (PPI) Third Party Certification program and shall bear the Third Party Administered seal. Only an approved Adapter, as manufactured by the pipe manufacturer, shall be used to connect HDPE pipe with existing pipe of dissimilar material.

10.6 Installation for HDPE Storm Sewer

Pipe installation must conform to all manufacturers' instructions or to Engineer's design requirements, whichever is more stringent, and is to be installed at the required line and grade as indicated on the plans. The Manufacturer must certify that the completed installation has met the installation requirements, which requires a representative of the Manufacturer to be on site during construction.

Once the trench is excavated on line, the pipe bedding should be placed to proper thickness. The top of the bedding should be adjusted to allow for the difference between the plan invert and pipe profile.

10.7 Dewatering for HDPE Storm Sewer

Excessive groundwater hinders proper placement and compaction of bedding and backfill. N-12 pipe will float in standing water therefore, it is imperative that a dry trench be provided. It may be necessary to provide sumps pumps, underdrains or a diversion ditch to insure a dry trench.

10.8 Joints and Joint Assembly for HDPE Storm Sewer

All joints are to be installed as per manufacturer's specifications.

10.9 Embedment Material for HDPE Storm Sewer

Embedment materials are those used for bedding, haunching and initial backfill and shall consist of #9 coarse aggregate. All embedment materials shall be free of frozen soil or ice when placed. Additionally, embedment materials shall be placed and compacted at optimum moisture content. Embedment materials shall be specified with consideration given to design loads and the classification and suitability of native soils.

10.10 Foundation for HDPE Storm Sewer

A stable foundation must be provided to insure proper line and grade is maintained. Unsuitable foundations must be stabilized at the Engineer's judgement. Unsuitable or unstable foundations may be undercut and replaced with a suitable bedding material, placed in 6" lifts.

10.11 Bedding for HDPE Storm Sewer

A stable and uniform bedding shall be provided for the pipe and any protruding features of its joints and/or fittings. The middle of the bedding equal to 1/3 of the pipe diameter OD should be loosely placed, with the remainder compacted to a minimum of 90% standard proctor density.

10.12 Haunching for HDPE Storm Sewer

Proper haunching provides a major portion of the pipe's strength and stability. Care must be exercised to insure placement and compaction of the embedment material in the haunches. For larger diameter pipes (>30"), embedment materials should be worked under the haunches by hand. Haunch materials may be #9, #57 or #78 coarse aggregates and must be placed and compacted in 8 inch maximum lifts, compacted to 90% standard proctor density.

10.13 Initial Backfill for HDPE Storm Sewer

Initial backfill materials are required to a minimum of ¾ of the pipe diameter for proper structural performance of the pipe. The AASHTO and ASTM specifications extend the initial backfill from the spring line to 6-12 inches above the pipe to provide protection for the pipe from construction operations during placement of the final backfill and protect the pipe from stones or cobbles in the final backfill.

10.14 Final Backfill for HDPE Storm Sewer

The final backfill shall be the same material as the proposed embankment. Generally, the excavated material may be used as final backfill. Placement shall be as specified for the embankment. In lieu of a specification, the final backfill shall be placed in 12 inch maximum lifts and compacted to a minimum

85% standard proctor density to prevent excessive settlement at the surface. Compaction shall be performed at optimum moisture content.

10.15 Manhole Connections for HDPE Storm Sewer

Consideration should be given to the project performance specified when selecting manhole connections. When connecting to concrete manholes or inlets grouting the pipe to the manhole or inlet using non-shrink grout provides a soil tight installation. A gasket placed in a pipe corrugation at the approximate center of the manhole or inlet wall will act as a water stop. This water-stop should provide a silt tight installation. Watertight installations may require flexible rubber connections such as rubber boots or adapters. When connecting to manholes, insure backfill is placed under the pipe adjacent to the manhole to prevent differential settlement.

10.16 Specifications for HDPE Storm Sewer

The following list is a common material, design and performance specification for ND-12 N-12HC.

ASSHTO M-252
AASHTO M-294
AASHTO MP 7-97
AASHTO Section 12, 18, 30

ASTM F 405
ASTM F 667
ASTM D 2321
ASTM F 477
ASTM 1417

10.16 Basis of Payment for HDPE Storm Sewer

Accepted quantities for HDPE Storm Sewer will be paid for at the Contract Unit Price as quoted for various sizes (which shall be full compensation for all work required under this Section) and paid per linear foot of specified HDPE Storm Sewer satisfactorily placed. Concrete caps shall be considered as incidental and part of the piping for payment purposes. Payment as specified above shall be considered full compensation for furnishing, transportation, and installation, including excavation, backfill material, removal and relocation of disturbed utilities, backfilling and pavement, pavement saw cuts, concrete bridge, sidewalk repairs, sod, fertilizer, and lime, silt fence, and all necessary material, labor equipment and incidental necessary to complete the work as required. Bid Items and the pay limits for surface restoration shall be in accordance with the appropriate Standard Drawings. Limits of surface restoration will be those limits as shown on the plans.

TECHNICAL SPECIFICATIONS

SECTION 11 - CURB BOXES AND JUNCTION BOXES

11.1 SCOPE

Curb Boxes and Junction Boxes shall be constructed where and as indicated on the plans and/or as directed by the ENGINEER. Curb Boxes shall conform to the Lexington-Fayette Urban County or Kentucky Department of Highways Standard Drawings Section 770.

11.2 MEASUREMENT AND PAYMENT

Payment for Curb Boxes and Junction Boxes will be made on the unit bid price per each, which payment shall include all material, including all masonry, covers, fittings, and reinforcing steel within the limits of the structure and all excavation, backfilling and disposal of surplus materials and incidentals necessary to complete the work in place.

All pipe, filter fabric, fill material, labor and other incidentals necessary to construct the Perforated Pipe subgrade drainage at Curb Boxes as depicted in LFUCG Standard Drawings 320 shall be considered incidental to the cost of the Curb Boxes. Subgrade drainage shall be installed per Case 1 of the LFUCG Standard Drawing 320.

TECHNICAL SPECIFICATIONS

SECTION 12 - MANHOLES

12.1 SCOPE

Work for this Section shall consist of manhole construction for manholes as shown on the plans.

At the option of the Contractor, manholes may be constructed of precast concrete manhole rings and cores. Manholes shall be constructed to conform to Lexington-Fayette Urban County Government Standard Drawings unless otherwise noted or directed by the ENGINEER. Frames and covers in street shall be adjustable as described below.

12.2 MATERIALS

Precast Concrete Rings: Precast concrete rings for manholes shall conform to ASTM C478, with a minimum concrete strength of 3,500 psi, except that rings for manholes over twelve (12) feet deep shall be Class III. Rings shall be of the tongue and groove type and shall be in a proper combination of height. Bricks may not be used for leveling and adjusting height.

Precast Concrete Cones: Precast concrete cones shall be of the size and shape shown on the plans and shall conform to the ASTM Standard Specification C-76 for the reinforced concrete sewer pipe; Class III and as specified above for Precast Concrete Rings.

Sealant for Concrete Rings: Conseal or its equal shall be used as sealant.

Manhole Steps: Manhole steps shall be coated cast iron or polypropylene plastic coated steel rod or of a type and size approved by the engineer. Steps shall be spaced approximately 12" to 16" o.c. vertically so as to form a continuous ladder. Steps shall be required in manholes when the structure is 4 feet and greater in depth. The threads of all steps shall have anti-skid properties for hand and foot grips. Manhole steps shall be installed in a vertical line and shall comply with OSHA standards in all respects.

Manhole Frames and Covers:
Standard Circular Manhole Frame and Cover-Manhole frame and lid assembly shall have a minimum lid weight of 150 lbs. and a total minimum frame and lid weight of 385 lbs.
with all steel in accordance with ASTM A-48 Class 35 spec.

Standard Adjustable Manhole Frame and Cover- Manhole frame and lid assembly shall be as per the LFUCG Standard details or approved equal and have a minimum lid weight of 150 lbs. and a total minimum frame and lid weight of 432 lbs. with all steel in accordance with ASTM A-48 Class 30 spec. Install casting with adjustments to lowest level. CONTRACTOR shall not use adjusters to match grade. Grease reservoir shall be filled.

Standard Watertight Manhole Frame and Cover- Manhole frame and lid assembly shall be Neenah#R-1916-D or approved equal, have a minimum lid weight of 150 lbs. and a total minimum frame and lid weight of 335 lbs. with all steel in accordance with ASTM A-48 Class 30 spec or higher.

Manhole covers must seat neatly in the rings with contact edges machined for even bearings and tops set neatly in the rings with contact edges machined for even bearings and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness and be marked in large letters, "SANITARY" or "STORM SEWER, LEXINGTON, KENTUCKY". The lids shall have two pick holes about 1-1/2 inches wide and V2-inch deep with 3/8-inch undercut all around. The contact surfaces of covers and corresponding rings in the rims shall be machined to provide full perimeter contact.

12.3 CONSTRUCTION METHODS

Width and Depth of Excavation of Structure:

Earth Excavation: In excavating for concrete structures, the required width shall be such as to permit forms to be constructed in the proper manner and to permit proper backfilling on completion of the structures. Depth of excavation for base shall be as shown on the Standard Drawings and/or as directed by the ENGINEER to obtain sufficient bearing.

Rock Excavation: Rock excavation for structures will be measured between the vertical planes passing eighteen (18) inches beyond the outside of the base and from the surfaces of the rock to the neat lines of the bottoms of the structures or the actual bottom on the rock ledge.

Laying Concrete Rings: Mortar joints shall not be more than 3/8 inch thick horizontally and not less than 3/8 inch wide vertically at the inside face of the manhole.

Precast concrete manhole rings shall be set level and plumb. Joints between sections shall not be less than 3/8 inch thick and the entire joint space between sections shall be completely filled with mastic, or other material approved by ENGINEER.

In sanitary sewer manholes, masonry shall be carefully and neatly constructed around the inlet and outlet pipes so that there will be no leakage around the outer surface. Extreme care will be exercised to construct watertight manholes with particular care around inlet and outlet pipe.

Manhole Inverts: Manhole inverts shall be formed from Class" A" concrete as shown on the plans. Inverts for a "straight-through" manhole may be formed by laying the pipe straight through the manhole and carefully removing the upper portion of the pipe after the bottom is completed. Curved inverts shall be constructed of concrete and shall form a smooth, even, half-pipe section. The inverts shall be constructed when the manhole is being built using prefabricated forms. Changes in direction of flow through the invert shall be made to a true curve with as large a radius as the size of manhole or inlet will permit. Invert slabs, which are situated at depths in excess of 12 feet, shall be reinforced per Lexington-Fayette Urban County Government Standard Drawings.

Casting: The cast iron steps shall be included in the wall of the manhole at the proper locations and elevations as the work progresses and shall be securely embedded (per Lexington-Fayette Urban County Government Standard Drawings). The cast iron frame for the manhole cover shall be set at the required elevation and properly anchored. Where manholes are constructed in paved areas, the top surface of the frame and cover shall be tilted to conform to the exact slope, crown and grade of the existing adjacent pavement. Frames shall be in full cement mortar beds or other approved material. Castings shall be ASTM A-48, Class 35.

Backfilling: Masonry Work shall be allowed to set for a period of not less than twenty four (24) hours. Outside holes shall be backfilled and compacted in the same manner as provided for backfilling of pipeline trenches. All loose or waste material shall be removed from the interior of the manhole or inlet. The manhole cover or inlet grating then shall be placed and the surface in the vicinity of the Work cleaned off and left in a neat and orderly condition. No backfilling shall be performed until the manhole has been inspected and approved for backfilling by the ENGINEER.

Vacuum Testing for Sanitary Sewer Manholes: All sanitary sewer manholes must pass the application of a vacuum test (ASTM C1244) performed by the CONTRACTOR and witnessed by the OWNER or ENGINEER prior to acceptance by the Lexington-Fayette Urban County Government.

12.4 BASIS OF PAYMENT

Accepted quantities for Manhole Construction with appropriate frame and cover shall be paid for at the Contract Unit Price as follows and shall include all labor, excavation, materials, equipment and incidentals.

Payment will be made under:

Sanitary Sewer Manhole (4'Dia)	Each
Sanitary Sewer Drop Feature	Each
Sanitary Sewer Frame & Cover	Incidental

TECHNICAL SPECIFICATIONS

SECTION 13 - MAINTENANCE OF TRAFFIC

13.1 SCOPE

The CONTRACTOR shall maintain all local vehicular and pedestrian traffic along the project during construction. The CONTRACTOR shall present a plan for maintenance of traffic and traffic signs subject to the approval of the Lexington-Fayette Urban County Government Engineer prior to the beginning of work. All bus routes, including school bus routes, shall remain in operation during scheduled bus operating hours. Loading zone space shall be made available as necessary during normal business hours. At least one lane of traffic shall be maintained on all cross streets.

13.2 MATERIALS

The CONTRACTOR shall furnish bridging plates or provide other means of maintaining safe access for pedestrians and service traffic to all businesses during normal working hours. Adequate personnel shall be available during daylight hours to assure maintenance.
Metal trench covers, granular backfill or other suitable methods shall be utilized to maintain vehicular traffic through areas disturbed by construction operations.

13.3 SIGNING

The CONTRACTOR shall furnish and erect suitable barricades, signs and other necessary devices to control, guide and safeguard traffic passing through or around the construction project. All such devices shall conform in all respects to the requirements of the Manual on Uniform Traffic Control Devices for Highway Construction and Maintenance Projects.

The CONTRACTOR, before erecting any barricades or changing the location of one already placed, shall notify the ENGINEER at least three days prior to such contemplated erection or change, except in case of an emergency. In case of an emergency, the ENGINEER may direct the CONTRACTOR to immediately provide safety and warning devices to safeguard traffic. All nighttime control devices requiring illumination shall be lighted every night during the entire period from sunset to sunrise. The CONTRACTOR will be held responsible for all damage to work due to failure to barricades, signs, lights, and watchmen to protect it; and whenever evidence of such damage is found prior to acceptance, the ENGINEER may order the damaged portion removed and replaced by the CONTRACTOR at the CONTRACTOR'S expense. The responsibility remains the CONTRACTOR'S until the project is accepted.

13.4 MEASUREMENT AND PAYMENT

Payment for Maintenance of Traffic will be made on a Lump Sum unit bid price which payment shall be full compensation for all work and materials required by this section.

Dense Graded Aggregate utilized to maintain access to driveways and for maintenance of traffic shall be paid for separately under Dense Graded Aggregate.

TECHNICAL SPECIFICATIONS

SECTION 14 - SANITARY SEWER

14.1 SCOPE

Work under this Section shall be of the size indicated in the Bid Schedule and it shall include all service, labor, materials, and equipment involved in performing the various tasks necessary to construct the Gravity Sanitary Sewers described in the plans and specifications in accordance with Lexington-Fayette Urban County Government Standard Drawings. Such tasks include, but are not limited to, furnishing pipe, excavating trenches (including rock excavating), bedding, laying, jointing, testing, backfilling, grading connecting to the new manholes, removing existing pipe, connecting existing services, and plugging. Any other necessary incidental tasks shall also be included in Work under this Section.

14.2 PVC (POLYVINYL CHLORIDE PIPE)

PVC Sewer Pipe shall conform to ASTM D-2152, D-2444 and D-3033, or D-3034 and shall have a maximum SDR of 35. The manufacturers shall submit five (5) copies of certification of tests for each lot of material represented by shipment to the job site.

All pipes shall be marked with the manufacturer's name, production lot number, ASTM Designation, PVC and the nominal diameter.

14.3 JOINTS FOR PVC PIPE

All joints shall be of the elastomeric gasket type and installed per the manufacturer's recommendations. Solvent cement joints shall not be used.

Pipe that has been field cut must be beveled for insertion into gasketed joints. Bevels can be made with hand or power tool. In either case, the finished bevel should be the same as the factory bevel.

14.4 DUCTILE IRON PIPE

Work under this Section shall be performed in accordance with applicable ASTM specifications, which include but are not limited to the following:

Ductile iron pipe shall conform to the current requirements of LFUCG Standards Specifications for sanitary sewer pipes unless otherwise noted on drawings.

The interior of the pipe shall be cement-mortar lined with asphalt seal coat in accordance with the current requirements of LFUCG Standard Specifications. Thickness of the lining shall be set forth in Section 4.10.1 of the aforementioned specification unless otherwise directed by the OWNER or

ENGINEER. The exterior of all pipes, unless otherwise specified, shall receive either coal or tar or asphalt base coating a minimum of 1 mil thick.
Each piece of pipe shall bear the manufacturer's name or trademark, the year in which it was produced and the letters "DI" or the word "DUCTILE." Pipe manufacturer shall furnish notarized certificate of compliance to the above A WW A or ANSI specifications.

All ductile iron pipes shall be polyethylene encased. All materials and installation shall be in accordance with A WW A CI05. The polyethylene film shall be a minimum of 8 mils for low-density polyethylene film and 4 miles for high-density cross-laminated polyethylene film.

14.5 INTERNAL PIPE DIAMETER

All sewers provided shall have a minimum actual internal diameter, which is equal to or greater than diameters indicated on the Contract Drawings.

14.6 EXCAVATION FOR PIPELINE TRENCHES

Unless otherwise directed by the ENGINEER, trenches in which pipes are to be laid shall be excavated in open cut to the depths required by field conditions or as specified by the ENGINEER. In general this shall be interpreted to mean that machine excavation in earth shall not extend below an elevation permitting the pipe to be properly bedded. Excavation shall be' in accordance with Lexington-Fayette Urban County Government Standard Drawings and ASTM D-2321.

Excavation shall be undercut to a depth below the required invert elevation that will permit laying the pipe in a bed of granular material to provide continuous support for the bottom quadrant of the pipe. The bedding shall be as set out in the following section.

Trenches shall be constructed according to LFUCG Standard Drawings 200 and 201.
Trenches shall be of sufficient width to provide free working space on each side of the pipe and to permit proper backfilling around the pipe, but unless specifically authorized by the ENGINEER, trenches shall in no case be excavated or permitted to become wider than 2'0" plus the nominal diameter of the pipe at the level of or below the top of the pipe plus 12".

All excavated materials shall be placed a minimum of two feet (2') back from the edge of the trench.

Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may necessitate changing the line or grade of the pipeline.

The trench shall be straight and uniform so as to permit laying pipe to lines and grades given by the ENGINEER. It shall be kept free of water during the laying of the pipe and until the pipeline has been backfilled. Removal of trench water shall be at the CONTRACTOR'S expense. Dry conditions shall be maintained in the excavations until the backfill has been placed. During the excavation, the grade shall be maintained so that it will freely drain and prevent surface water from entering the excavation at all times.

When directed by OWNER, temporary drainage ditches shall be installed to intercept or direct surface water, which may affect work. All water shall be pumped or drained from the excavation and disposed of in a suitable manner without damage to adjacent property or to other work.
Minimum cover of 30" shall be provided for all pipelines.

14.7 PIPE BEDDING

All pipes shall be supported in a bed of well-compacted #9 crushed stone. Bedding material shall be free from rock, foreign material, frozen earth, and be acceptable to the OWNER or ENGINEER. In no case shall pipe be supported directly on rock. When rock is encountered in the trench bottom, bedding shall consist of fine gravel or Size #9 crushed stone only. Thickness of crushed stone bedding shall be a minimum 6" below pipe barrel.
Pipe bedding is not a separate pay item.

In wet, yielding mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, or where backfill materials are fluid such as flowable fill, movements of the pipe might take place during the placing of the backfill. The pipe must be weighted or secured permanently in place as such means as will provide effective.
When ordered by the OWNER or ENGINEER, yielding and mucky materials sub grades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe.
Crushed stone or other such granular material, if necessary, as determined by the OWNER or ENGINEER to replace subgrade material, shall be a separate pay item and classified as "Special Pipe Bedding." Removal of poor material is not a separate pay item.

Installation shall be in accordance with Lexington-Fayette Urban County Government (LFUCG) Standard Drawings and ASTM D-2321.

14.8 LAYING PIPE

The laying of pipe in finished trenches shall be commenced at the lowest point so the spigot ends point in the direction of flow.
All pipes shall be laid with ends snugly seated and true to line and grade. Supporting of pipes shall be as set out hereinbefore under "Pipe Bedding" and in no case shall the supporting of pipes on blocks be permitted.

Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to insure its being clean. Each piece of pipe shall be lowered separately unless special permission is given otherwise by the ENGINEER. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, they shall be removed and replaced with satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit

in a line it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe. Throughout the pipe laying process, special attention shall be given to keeping the inside of the pipe free of dirt or rock. '

Pipe shall not be laid on solid rock. A pad of granular material as specified in "Pipe Bedding" shall be used as a pipe bedding. Pipe bedding is not a separate pay item.
Irregularities in subgrade in an earth trench shall be corrected by use of granular material.
When ordered by the ENGINEER, unsuitable materials in subgrades shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe.

When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitting into the pipe bell, so as to exclude earth or other material, and precautions taken to prevent flotation of pipe by runoff or seepage into trench.

No backfilling (except for securing pipe in place) over pipe will be allowed until the ENGINEER has an opportunity to make an inspection of the joints, alignment, and grade in the section laid.

A concrete collar shall be provided where two dissimilar materials meet if a seal can't be made between the existing sanitary sewer and the new Pipe. It shall extend above and below the pipe joint 6" and be 18" in length, minimum.

14.9 BACKFILING PIPELINE TRENCHES

Backfilling or pipeline trenches shall be accomplished in accordance with Lexington-Fayette Urban County Government Standard Drawings. All backfill shall be placed in a manner approved by the ENGINEER, and those materials requiring compaction shall be carefully compacted to avoid displacement of the pipe. Compaction shall be accomplished by hand tampering or by approved mechanical methods.

Before final acceptance, the CONTRACTOR will be required to level off all trenches or to bring the trench up to grade. The CONTRACTOR shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.

In the event that pavement is not placed immediately following trench backfilling in paved areas, the CONTRACTOR shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times.

14.10 SETTLEMENT OF TRENCHES

Whenever lines are in, or cross, driveways and streets, the CONTRACTOR shall be responsible for any trench settlement, which occurs within these rights-of-way within one year from the time of [mal acceptance of the work. If paving shall require replacement because of trench settlement within this time, it shall be replaced by the CONTRACTOR at no extra cost to the OWNER. Repair of settlement damage shall meet the approval of the OWNER and/or the Kentucky Department of Highways.

14.11 TESTING OF GRAVITY SANITARY SEWERS

On all projects involving installation of sanitary sewer lines, the finished work shall comply with provisions listed below or similar requirements, which will insure equal or better results:

1. After the collecting and/or outfall lines or system have been brought to completion, prior to final inspection, the CONTRACTOR shall rod out the entire system by pushing through each individual line in the system, from manhole to manhole, appropriate tools for removal from the lines of any and all dirt, debris and trash.

2. During the final inspection, the ENGINEER will inspect each individual line, from manhole to manhole, either by use of lights or other means at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the plans.

3. The ENGINEER will require that the CONTRACTOR pass through the system under momentum a wooden ball of a diameter of one-inch less than the nominal diameter of the pipe, except that no ball larger than eight (8) inches in diameter shall be used.

4. Deflection tests shall be performed on a flexible pipe. The test shall be conducted after final backfill has been in place at least 30 days to permit stabilization of the system. No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, pipe shall be replaced or corrected. The rigid ball cylinder or mandrel used for deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on which is specified in the ASTM Specification, including the appendix, to which the pipe is manufactured. The pipe shall be measured in compliance with ASTM D-2122 Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings. The test shall be performed without mechanical pull devices.

5. All lines or sections of lines that are found to be laid improperly with respect to line or grade, that are found to contain broken or leading sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the CONTRACTOR'S expense.

6. The CONTRACTOR shall lay sewer lines, including house connections, so that the access of ground water or loss of water from the sewer system or other gravity flow piping which does not normally flow full will be limited to 10 gallons per inch diameter per mile per day. This limitation is inclusive of manholes, sewers, house connections, and appurtenances. This requirement may be applied to a portion of the contract work, such as the sewers in a separate drainage area or to a single section of the line between two manholes.

7. To test for leaks, the ENGINEER will require that all completed piping as specified herein after backfilling be tested by low-pressure air test, exfiltration, or infiltration test. Low-pressure air test will be restricted to sewer up through 24inch diameter. Sewer larger than 24-inch diameter shall receive an exfiltration test if above ground water, or infiltration test if below ground water. Should the low-pressure air test results be inconclusive, or at the request of the OWNER or ENGINEER, an exfiltration or infiltration test will be required on the low-pressure air tested segments. Services, labor, equipment, and supplies required for all tests shall be furnished by the CONTRACTOR.

8. Smoke testing may be used only to locate leaks and in no case shall be considered conclusive. In all cases the smoke test shall be accomplished by an air test, exfiltration test or infiltration test. Smoke testing may only be performed where ground water is low and smoke is blown into a conduit that is properly sealed. All such leaks or breaks discovered by the smoke test shall be repaired and/or corrected by the CONTRACTOR at his own expense. Equipment and supplies required for smoke tests shall be furnished by the CONTRACTOR. The CONTRACTOR may also be required to smoke test the first section (manhole-to-manhole) of each size of pipe and type of joint on each construction contract prior to backfilling to establish and check laying and jointing procedures. Other supplementary smoke tests prior to backfilling may be performed by the CONTRACTOR at his option; however, any such test shall not supplant the final tests of the completed work unless such final tests are waived by the ENGINEER.

9. Low-pressure air tests shall be performed on all gravity sanitary sewer to verify water-tightness of pipe joints and connections. The Contractor shall perform testing on each manhole-to-manhole section of sewer line after placement of backfill

Testing, of Polyvinyl Chloride (PVC) and Ductile Iron (DI) pipe sewer lines, shall be performed in accordance with the current edition's of ASTM F1417, "Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air", and UNI-B-6, "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe" respectively. Testing, of reinforced concrete pipe sewer lines, shall be performed in accordance with the current edition of ASTM C 924, "Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method".

All testing equipment shall be inspected by the Engineer to ensure that equipment is functioning properly.

The rate of air loss in the section under test shall be determined by the time-pressure drop method. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig shall be not less than that indicated in the referenced standards.

Immediately following the low-pressure air test the Contractor shall notify the Engineer of the test results. A Low-Pressure Air Test Report shall be completed by the Contractor during testing. The report shall be completed according to the procedures outlined in LFUCG's Construction Inspection Manual, current edition. A copy of the completed Low-Pressure Air Test Report shall be provided to the Engineer and LFUCG Division of Sanitary Sewers for each test.

Pipes failing the pressure test will not be accepted and shall be repaired or replaced until a successful test is achieved.

When conducting a low-pressure air test, the Contractor shall securely install and brace all plugs prior to pressurizing the pipe. Personnel shall not be permitted to enter manholes when the sewer pipe is pressurized.

10. In order to test for infiltration (for concrete pipe only) the OWNER or ENGINEER may also require exfiltration tests on section of pipe between manholes after it has been laid but prior to backfilling. Exfiltration tests shall be conducted by plugging the lower end of the section of sewer to be tested and filling the sewer with water to a point approximately five feet above the invert at the lower end and at least one foot above the pipe at the upper end, observing leakage at all joints and measuring the amount of leakage for a given interval count. Exfiltration shall not exceed 110 percent times the infiltration limits set out hereinabove. All observed leaks shall be corrected even though exfiltration is within the limits.

11. To test for infiltration, (for concrete pipe only) the OWNER or ENGINEER may also require that the CONTRACTOR plug the ends of all lines at the manhole so that measurements may be made at each section of sewer line. Infiltration tests shall consist of weir measurements to determine quantity if any infiltration. Measurements shall be taken at line locations directed by the OWNER or ENGINEER. This infiltration test will not be made until the sewer line is completed, the line shall be dewatered and a satisfactory test conducted to measure infiltration for at least 24 hours. The amount of infiltration, including manholes, tees and connections shall not exceed 200 gallons per nominal inch diameter per mile of sewer per 24 hours. The CONTRACTOR will be required to correct all conditions that are conducive to excessive infiltration that may be required to relay such sections of the line that may not be corrected even though infiltration is within allowable limits.

12. Contractor shall perform and/or provide for a TV inspection of all lines following the completion of the air test and manhole vacuum test. The TV inspection shall be directed by the Engineer. TV inspection shall be performed in accordance with the LFUCG Construction Inspection Manual, 6.64 Sanitary Sewer TV Surveys and Technical Specification 22. For sewer lines in the street, TV inspection is to be done after fill has been in place at least 30 days and to be done before final surface is placed on street. The following closed circuit television inspectors meet LFUCG's guidelines.

Leak Eliminators	(859) 875-2995
Pipe Eyes	(859) 987-2529
JGK Testing and Supply	(512) 860-1400

14.12 HOUSE CONNECTIONS

In those instances where 4-inch or 6-inch sanitary sewer pipe is used to connect a house to a sewer main, installation must be done by a Licensed Master Plumber. All House Laterals shall be connected per LFUCG Standard Drawings 230, 231, and 232. Lateral Cleanout shall be provided and installed as per the Two-Way Cleanout Drawing included in the Standard Drawing Section of these Specifications.

14.13 CLEAN UP

Upon completion of installation of the piping and appurtenances, the CONTRACTOR shall remove any surplus construction materials resulting from the Work. The CONTRACTOR shall grade the

ground on each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as close as possible to the original ground line.

14.14 BASIS OF PAYMENT

Accepted quantities of gravity sanitary sewer line shall be paid for at the Contract Unit Price per linear foot and shall be full compensation for all Work under this Section.

All labor, materials (other than the sanitary sewer pipe), equipment, excavation, bedding, backfilling and incidental items necessary to the Work shall be included in the payment for PVC Sanitary Sewer or Ductile Iron Sanitary Sewer." Rock excavation, removal of existing pipe, concrete collars and removal of pavement and sidewalk shall also be incidental to the placement of the pipe.

Payment for PVC Lateral shall be paid for at the Unit Bid Price per Linear Foot and shall include all labor, materials, including pipe, connections, equipment, excavation, bedding, backfilling and incidental items necessary to provide a lateral from proposed sanitary sewer to existing right of way line.

Payment for "Two-Way Cleanout" shall be paid for at the Unit Bid Price per each and shall include all labor, materials, connections, equipment, excavation, bedding, backfilling, and incidental items necessary for providing a two-way cleanout and connect the existing house lateral.

TECHNICAL SPECIFICATIONS

SECTION 15 - ROADWAY AND DRAINAGE EXCAVATION

15.1 SCOPE

Roadway and drainage excavation shall consist of the removal and satisfactory disposal of all materials taken from within limits of the work contracted, meaning the calculated material lying between the original groundline and the excavation limits established or approved by the ENGINEER as shown on the final cross sections or grading plan.

In this contract, Roadway and Drainage Excavation is included under the more general bid item "Grading".

15.2 GENERAL

Included in this work shall be excavation for widened cuts and roadbeds embankment subgrades, under-cutting subgrades in cut sections, shoulders: slopes, removal of unsuitable material, ditches, waterways, intersections, approaches, balance excavation, and inlet and outlet ditches, all as indicated on the plans or as directed.

Roadway and drainage excavation shall also included removal and satisfactory disposal of miscellaneous structures removed from within the limits of the roadway and drainage cross sections such as, but not limited to, all types of pavements and pavement bases, whether rigid or flexible; sidewalks; all curbs and curbs and gutters; and all conduits that have no salvage value, such as unserviceable drainage pipe, sewer pipe, waterlines, and other unserviceable utility lines. The plans may, or may not indicate the exact locations of the various types and quantities of these miscellaneous items to be removed and disposed of; however, it is the intent of these specifications that the removal of any such items that fall within the limits of the roadway and drainage cross sections as here in before defined, whether or not shown on the plans, shall be included in Roadway and Drainage Excavation.

When quantities and bid items are shown on the plans or in the proposal for the removal of various types of miscellaneous items, it is the intent of these specifications that such quantities and bid items shall include only those miscellaneous structures that are found outside of the roadway and drainage cross sections.

Except as otherwise specifically stated roadway and drainage excavation shall also include inlet and outlet ditches, regardless of the classification of the material encountered, whether shown or not shown on the plans and whether or not on the right-of-way as shown. When the work is extended by the OWNER beyond the project area limits shown on the plans, easements or additional property will be obtained by the OWNER.

All drilling, grinding, and sawing of rock, shale, concrete and other similar dust producing materials shall be performed in accordance with the requirements of the ENGINEER.

All excavation operations shall be conducted in accordance with the applicable requirements of Section 02100, Erosion Control, and Section 02105, Water Pollution Control.

Clearing and grubbing operations for excavation areas shall be completed prior to beginning excavation operations. The CONTRACTOR shall be responsible for and shall take all necessary precautions to protect and preserve any and all existing culverts, pipelines, conduits, subdrains, or parts thereof which may be affected by his operations on the contract and which, in the judgment of the ENGINEER, may be continued in use without any change. The CONTRACTOR shall, at his own expense, satisfactorily repair or replace any damaged part of any such culvert, pipeline, conduit, or subdrain which may result from his operations or negligence during the life of the contract.

During construction, all areas affected by excavation shall be maintained at all times in such condition that it will be well drained.

15.3 CLASSIFICATION

Without regard to the materials encountered, all roadway and drainage excavation shall be **unclassified** and shall be designated as Roadway Excavation. It shall be distinctly understood that any reference to rock, earth, or any other material on the plans or cross sections, whether in numbers, words, letters, or lines, is solely for the OWNER'S information and is not to be taken as an indication of classified excavation or the quantity of either rock, earth, or any other material involved.

The bidder must draw his own conclusions as to the conditions to be encountered. The OWNER does not give any guarantee as to the accuracy of the data and no claim will be considered for additional compensation when the materials encountered are not in accord with the classification shown.

15.4 SLOPES

All excavation shall be performed in such a manner as will ensure against removing or loosening any material outside of the required slopes. Slopes shall be shaped to reasonable close conformity with the lines and cross sections shown on the plans, with no deviations, therefrom readily discernible from the road, except as otherwise directed. All rock cut slopes shall be left with a reasonable uniform surface and all loose and overhanging rock shall be removed. Under no condition shall holes be gouged or dug in back slopes or in embankment slopes.

The slopes in cuts may be varied by the ENGINEER during construction, depending upon the material encountered in excavation. The cuts may be widened and the slopes may be varied to secure sufficient material for the formation of embankment and shoulders, to prevent landslides, to improve sight distance, or for any other reasons that such widening or variations are deemed to be to the best advantage of the work. When a cut is made on any section of the roadway in any material that may slide, the excavation shall be removed to the slope lines as designated on the plans or as directed, and no vertical slopes will be allowed during the process of excavation of such

cuts, except in stage construction when material is left in cuts for future shoulder construction. No payment will be made for any excavated material, which is used for purposes other than those designated.

15.5 DITCHES

Ditches shall include inlet and outlet ditches and such other ditches as may be required for the satisfactory completion of the work.

15.6 USE OF EXCAVATED MATERIALS

All suitable material removed from excavation shall be used, insofar as practicable, in the formation of embankments, subgrade, or shoulders; as backfill for structures or for other purposes shown on the plans or as directed. No payment will be made for any excavated materials used for any purpose other than that indicated on the plans or approved.

All sod and soft or spongy material shall be removed and disposed of as directed. Such materials shall not be used in the construction of the grade, except as provided in Section 02223.

All rocks and boulders, when directed, shall be placed in the embankments, provided the embankments are of sufficient depth to provide 12 inches or more soil cover over such rocks or boulders placed within the shoulder limits. Such rock and boulders shall be placed under the shoulders rather than under the pavement foundation when the embankment is constructed principally of soils.

Asphalt and concrete from the excavation shall be hauled by the contractor to the LFUCG CD Landfill located on Haley Pike, where tipping fees will be waived. Asphalt and concrete are not to be buried at any waste site in Fayette County. Soil and crushed stone may be hauled to the LFUCG landfill or to an alternate site obtained by the contractor.

Material wasted off the project area shall be placed on approved sites obtained by the CONTRACTOR at no cost to the OWNER. The owner of the site will be required to obtain an LFUCG Grading Permit, which includes the preparation of a BMP Plan. All waste shall be placed to avoid the obstruction of drainage, and the wasted material shall be seeded and protected using the appropriate application rates of agricultural limestone, fertilizer, seed, and mulch as directed on the BMP Plan.

The CONTRACTOR shall be responsible for all permitting and legalities associated with offsite disposal of materials. The CONTRACTOR shall be responsible for any fines associated with not complying with sediment erosion control plans, releases of sewage, etc.

The CONTRACTOR shall furnish to the OWNER copies of written agreement with the property OWNER, approval of the OWNER(S) of utilities of any nature existing within the proposed waste area.

15.7 ROADBED

In addition to the limits of the roadbed, the work required herein shall extend to the ditch lines or curb lines in cuts when so directed. With regard to Oak Hill Drive, work under this section shall conform to the KYTC Road & Bridge Specifications current edition.

Where rock is encountered in the excavation, it shall be removed between ditch lines or curb lines to a depth below the required grade as shown on the plans with no points of rock projecting above such depth. The final surface of the rock shall be left so that complete drainage will be provided, and no water will be pocketed at any point. The refill over this surface shall be made of selected materials and shall contain no stone or spalls larger than 4 inches. All refill shall be placed in layers not exceeding 12 inches in depth, loose measurement, and compacted as specified in Section 02223. No allowance will be made for excavation and refill material to a greater depth below the required grade than as shown on the plans. Where not designated on the plans, the refill material shall be selected by the ENGINEER.

In cut sections the roadbed, whether it consists of existing material or refill material, shall be compacted in accordance with the requirements of Section 02223. When the material in place does not contain sufficient moisture to obtain proper compaction, the roadbed shall be thoroughly scarified and broken to minimum depth of 6 inches, the moisture content increased as directed, and the roadbed compacted. Material unsuitable for the roadbed, when encountered at subgrade elevation, shall be removed to such depths as indicated on the plans or as directed, and disposed of as directed and replaced with #2 stone. Material that is unstable due to excessive moisture but that is otherwise suitable for the roadbed shall either be scarified, allowed to dry, and compacted; or removed, dried, and used for refill or embankment, as directed by the ENGINEER. Manipulation to speed drying will be permitted. No additional payment will be made for scarifying or manipulation necessary to increase or decrease the moisture content as this is considered incidental to the work. Payment will be made for the #2 stone used to fill the excavated area, the existing material to be removed shall be incidental to the #2 stone backfill (No. 2 Stone Bridging). When the ENGINEER directs that the material removed be wasted or requires the material to be used as refill or in embankment, then any additional material necessary for .refill will be incidental to Roadway Excavation.

The CONTRACTOR shall conduct roadway excavation operations so that a sufficient quantity of selected materials is available, stockpiled, or otherwise reserved for providing the required volume of material necessary to complete the roadbed in accordance with the plans and as indicated herein.

15.8 METHOD OF MEASUREMENT

Roadway and drainage excavation will not be measured for direct payment. Water used to provide sufficient moisture for compaction of the roadbed in cut sections will not be measured for separate payment but will be considered incidental to other items in the contract.

15.9 PAYMENT FOR DESIGN QUANTITIES

Final payment will be made at the contract unit price for the design quantity shown within the neat lines of the cross sections or grading plans, increased or decreased by authorized adjustments.

15.10 AUTHORIZED ADJUSTMENTS

Adjustments to the design quantities of Roadway Excavation authorized by the OWNER or ENGINEER will be made only for the following purposes:

Include changes in the quantity of work due to benching, changing slopes or grades, removing slides, and any other procedures required by the OWNER or ENGINEER on the project.

15.11 MISCELLANEOUS ITEMS

Removing and salvaging or disposal of all other items within the project area or easements not included in this Section such as guardrails, headwalls, inlet boxes, etc., whether shown on the plans or not shall be considered incidental to the contract and no direct payment shall be allowed, unless otherwise provided.

In removing manholes, catch basins, and inlets, any live sewers connected thereto shall be rebuilt and properly reconnected, and satisfactory by-pass service shall be maintained during such construction operations.

15.12 BASIS OF PAYMENT

No direct payment will be made for roadway and drainage excavation.

TECHNICAL SPECIFICATIONS

SECTION 16 - EROSION AND SEDIMENT CONTROL

16.1 SCOPE

In general, the section includes all of the sediment and erosion control items needed to satisfy the regulatory authorities and may include, but not be limited to the following:

1. Sign and obtain the Notice of Intent.
2. Prepare and maintain a Stormwater Pollution Prevention Plan (SWPPP).
3. Termination of the Notice of Intent.
4. "Filtrexx" inlet protection
5. 4' high Filter Fabric
6. "North American Green" Erosion Control Mat

16.2 PERFORMANCE REQUIREMENTS

1. Intent for the Division of Water. Submit Notice of Intent: Fill out, sign and submit the Notice of Intent. Sample form is attached.

2. Prepare a Stormwater Pollution Prevention Plan (SWPPP): A Professional Engineer licensed to practice in the Commonwealth of Kentucky shall prepare and shall maintain, a SWPPP Plan. Update periodically as site conditions change. A guideline entitled "NPDES Stormwater Pollution Preventions Guideline Document" is available online at...

http://cfpub.epa.gov/npdes/stormwater/swppp.cfm.

3. Weekly inspection of all erosion and sediment control items. Inspection is also required after rainfall events of 0.5 inch or more. Sample inspection report forms are attached.

4. Provide "Filtrexx" 32" Diameter FilterSoxx with Growing Media per manufacturer's specifications. The contractor may manufacture these on-site or pre-manufactured Soxx may be delivered for installation. Stakes shall be installed through the middle of the Soxx on 5 ft centers using 2inch by 2 inch wooden stakes. Staking depth shall be minimum 1 ½ feet. The Soxx shall be seeded at the time of manufacture and installation to create a contained "green vegetated filter".

5. 4' High Filter Fabric shall be installed per manufacturer's specifications and in accordance with the standard detail.

6. North American Green Erosion Control Mat shall be installed per manufacturer's specifications in locations outlined on the construction plans. Install along channel sides to extend five (5) feet horizontally on either side of the channel. Install on all slopes of 4:1 or greater.

16.3 SUBMITTALS

1. NOI: Submit NOI to KPDES Branch, Division of Water, per attached instructions. A copy of the submitted NOI form shall be sent to the ENGINEER and the Owner.

2. SWPPP: Submit SWPPP to Kentucky Division of Water. A copy shall be sent to the ENGINEER and the Owner.

3. The SWPPP prepared for the KY DOW NOI may be submitted to the LFUCG for review to obtain a LFUCG Land Disturbance Permit.

4. Subcontractor Signatures: Signatures of all subcontractors for approval stating that they have read, understand and that they intend to comply with the SWPPP. A copy of the signatures shall be submitted to the Architect and the Owner.

16.4 EXECUTION

1. Continuous Service: The sediment and erosion control items are to be installed prior to the commencement of all other construction activities on site. Continuous maintenance shall be required until the next contract has been signed. To transfer the Notice of Intent, a letter is to be written and signed by the new contractor. Once this letter has been received and approved by the Division of Water the Contractor's responsibility shall be relieved.

2. Prepare Daily Field Reports per SWPPP requirements. A sample form is attached. Submit to regulatory agency as required.

3. Prepare Erosion and Sediment Control Inspection and Maintenance Report Form weekly per SWPPP requirements. A sample form is attached. Submit to regulatory agency as required.

4. Remove temporary erosion sediment control measures when site is 95% stabilized. Seed and protect any disturbed areas with permanent grass protect mixture.

5. he SWPPP shall be updated by the preparer as field conditions warrant.

6. Pollution Prevention measures shall not be constructed until the SWPPP has been accepted by the LFUCG.

7. No work on the project may commence until Pollution Prevention Measures are installed and accepted by the LFUCG and a Land Disturbance Permit is issued.

8. CONTRACTOR is responsible for filing all appropriate Notices of Termination (NOT) when the site is stabilized.

STORMWATER POLLUTION PREVENTION PLAN
INSPECTION AND MAINTENANCE REPORT FORM

KPDES Permit No._____
Project_____
Inspected By: _____ Title: _____
Date: _____ Time: _____ Weather: _____ Temp. Range: _____

Storm Water Inspection Checklist. Applies to All Areas that are Impacted by Construction			
Condition Observed	**Locations(s) or "Not Observed"**	**Corrective Action**	**Responsible / Complétion Date**
Polluant Sources			
Are there evidence of spilled materials (oil, fuel, beverage product) on ground)?			
Are there any debris piles with petroleum cans, chemical containers or other sources of possible pollution?			
Evidence of spilled materials in storm water (sheen on water, odor, unusual color, foam, sediment).			
Are there leaking pipes, pumps, valves and/or hose connections on construction equipment?			
Are there evidence of tracking on spilled materials on ground?			
Other conditions:			
Erosion Control			
Are there any bare areas which require temporary or permanent stabilization? (seeding, mulch, other?_____)			

Are all finished cut and fill slopes adequately stabilized?			
Do any structural practices show evidence of overtopping, breaks or erosion?			
Are all earthen structures seeded and mulched? Is vegetation providing adequate protection?			
Do any seeded areas require fertilizer, reseeding or additional mulch?			
Other conditions:			
Sediment Control			
Are perimeter sediment trapping measures in place and functioning properly?			
Have sediment-trapping practices been installed in the proper location and before extensive grading begins?			
Silt fences and in place and functional with no breaches.			
Is sediment leaving the site and/or damaging adjacent property?			
Is there mud on public roads or at intersections with public roads?			
Other conditions:			
Runoff Conveyance and Control			
Are all on-site drainage channels and outlets adequately stabilized? (channel lining, seeding, other_____; outlet stabilization_____)			
Are all operational storm sewer inlets protected so that sediment will not enter the system?			

Is there evidence of increased off-site erosion since the project began?			
Is there clogged storm drain?			
Are downstream waterways and property adequately protected from increases in stormwater runoff?			
Are there debris, trash, sediment, or other materials in drain structures?			
Other conditions:			
Dust Control			
Are there evidence of dust on surrounding areas, building & cars?			
Dust suppression applications this week?			
Other conditions:			
Hazardous Material Equipment Fueling			
Broken, cracked, or leaking secondary containment.			
Missing absorbent material or other spill cleanup materials near oil or chemical storage or dispensing areas.			
Are there chemical drums without secondary containment?			
Are there chemicals dispensed, poured or used outside without containment?			
Other conditions:			

Maintenance			
Leaking construction debris dumpsters/containers.			
Do any structural practices require repair or clean-out?			
Have temporary structural practices that are no longer needed been removed?			
Is any work occurring in streams? Is channel damage being minimized? Is stabilization or a temporary stream crossing needed?			
Are there open drums (no lids or bungs) ?			
Are utility trenches being backfilled and seeded properly?			
Vehicle or equipment maintenance performed outside without cover or secondary containment.			
Wash water from vehicle or equipment washing that has potential to flow to storm drain, ditch, or ground.			
Uncovered construction debris dumpster or roll off box (without lid or cover when not in use.			
Other conditions:			

Signature of Inspector: _____ **Date:** _____

16.5 MEASUREMENT AND PAYMENT

1. Payment for Erosion and Sediment Control shall be for SWPPP preparation and revision, installation, maintenance, and removal of Pollution Prevention measures and other work necessary to make the work compliant with Federal, State and Local regulations, laws and/or ordinances. A maximum of fifty (50) percent of the amount bid for Erosion and Sediment Control shall be payable until the project reached substantial completion. At substantial completion, the amount payable may be increased to ninety (90) percent of the bid amount. When the site is stabilized, the remainder shall be paid.

2. The Owner will make payment for the completed and accepted quantities under the following:

Pay Item	Pay Unit
All items required for Erosion and Sediment Control	Lump Sum

TECHNICAL SPECIFICATIONS

SECTION 17 – CRUSHED LIMESTONE

17.1 AGGREGATE FOR NO. 2 and NO. 9 CRUSHED LIMESTONE

Aggregate for no. 2 and no. 9 Crushed Limestone shall be limestone meeting the general requirements of Section 805 of the Kentucky Transportation Cabinet/ Department of Highways Standard Specifications for Road and Bridge Construction. This material shall be produced by using a crusher, grizzly, or sieve with openings to produce appropriate gradation. Gradation shall be as per Gradation charts in section 805 of the KDOH standard specifications.

17.2 METHOD OF PAYMENT

The Owner will make payment for the completed and accepted quantities under the following:

Pay Item	Pay Unit
NO. 2 Crushed Limestone	Ton
NO. 9 Crushed Limestone	Ton

TECHNICAL SPECIFICATIONS

SECTION 18 – PROJECT SIGN

18.1 SCOPE

The Work covered by this specification consists of furnishing all materials, equipment, and labor for erecting the Project Sign as indicated in the LFUCG Standard Drawing 323. All statements included with the drawing are pertinent with the exception of Line 1. Payment for the Project Sign will be as indicated below. .

18.2 BASIS OF PAYMENT

As stated in Part VIII *Technical Specifications* of the this Contract Document in Section 1.20 "Project Sign" is incidental to the contract price. Contractor shall install two sign at the locations identified at the Pre-Construction Meeting. This Technical Specification was clarified and amended during the Pre-Construction Meeting.

TECHNICAL SPECIFICATIONS

SECTION 19 – FINAL CLEANUP

19.1 SCOPE

The work will not be considered as completed, and final payment will not be made, until the right-of-way and all ground occupied by the CONTRACTOR is connection with the work has been cleared of all rubbish, equipment, excess materials, temporary structures, and weeds. Rubbish and all waste material of whatever nature shall be disposed of in waste areas provided by the CONTRACTOE. All property, both public and private, which has been damaged in the execution of the work, shall be replaced or restored in an acceptable manner. All ditches shall be drained and all space shall be left unobstructed and in such condition as acceptable to the ENGINEER.

19.2 BASIS OF PAYMENT

Final Cleanup shall be paid for by Lump Sum.

TECHNICAL SPECIFICATIONS

SECTION 20 - GEOTEXTILE CONSTRUCTION

20.1 SCOPE

Work for this Section shall be in accordance to Kentucky Department of Highways Standard Specifications Sections 214 and 843 (Type 1 for slope protection and channel lining, Type II for underdrains, Type III for subgrade or embankment foundation stabilization, and Type IV for drainage blankets and pavement edge drains), current edition and shall include all labor, excavation, materials, equipment, and incidentals necessary to complete the work.

20.2 BASIS OF PAYMENT

Accepted quantities for Geotextile Construction will be paid for at the Contract Unit Price per various types as quoted which shall be full compensation for all Work required under this Section and paid per square yard of geotextiles satisfactorily placed. All labor, materials (other than the geotextile fabric), equipment, and excavation shall be incidental to the placement of geotextile fabric (Type I, Type II, Type III or Type IV).

TECHNICAL SPECIFICATIONS

SECTION 21 – CLEANING & INTERNAL INSPECTION OF STORM SEWER PIPE: CCTV

21.1 SCOPE

A CLOSED CIRCUIT TELEVISION (CCTV) survey is required for all newly installed sewer pipe and/or any designated existing pipe shall be performed. The television survey shall be performed by an experienced CCTV Contractor approved by the LFUCG Division of Engineering.

The CCTV inspections should be performed by the approved contractor a minimum of thirty (30) days after any new pipe has been backfilled, unless otherwise approved by the Engineer.

21.2 GENERAL

All lines designed by the Engineer shall be internally inspected. The purpose of the inspection is to locate structural damage that may be present in the collection pipe.

Any structural damage found in the pipe impairing the CCTV inspection, shall be documented and the Engineer should be notified immediately. The Engineer and Owner will evaluate the damage and, if cost-effective, the Engineer will notify the Contractor in writing to proceed with cleaning or additional repairs. These repairs will be made at the unit prices shown on the Contractor's Bid Proposal.

The Owner makes no guarantee that all of the sewers to be entered are clear for the passage of a camera. The methods used for securing passage of the camera are to be at the option of the Contractor, and the costs must be included in the bid price for television inspection. The cost of retrieving the television camera, under all circumstances, when it becomes lodged during inspection, shall be incidental to this portion of the work.

No later than each Thursday morning, the Contractor's Project Coordinator shall provide the Engineer with a tentative weekly schedule, and shall also provide daily notification of those areas to be investigated.

21.3 EQUIPMENT

The CCTV mainline inspection system television shall be one specifically designed and constructed for such inspection. The inspection system shall be able to perform pan/tilt or pan/rotate operations. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The system shall be operable in 100 percent humidity conditions. The camera, television monitor and other components of the CCTV system shall be capable of producing a minimum 500-line resolution video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, equipment shall be removed and no payment made for unsatisfactory inspection.

21.4 RECOMMENDED METHOD FOR INTERNAL INSPECTION

The camera shall be moved through the sewers in the downstream direction at a uniform rate not to exceed 30 ft./min., stopping when necessary to insure proper documentation of the sewer's condition. Manual winches, power winches, TV cable and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions may be used to move the camera through the sewer line.

If during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole. If the camera again fails to pass through the entire manhole section, the Contractor shall notify the Engineer of the situation.

21.5 INSPECTION LOGS AND CD/DVDS

All CD/DVDS, and logs shall be labeled with the Contractors Name, Contract number, DVD number (logs must match that number) and with each Contractor the DVD/ logs must start at number 1 and progress upward till the end of this contract.

A log approved by the Engineer shall be provided for all line inspections listing the watershed, line segment ID, line segment location, upstream manhole depth, downstream manhole depth, pipe diameter, pipe material, defects and defect ratings, also see notes above. Printed and digital records shall be kept by the Contractor and will clearly show the location of each infiltration point observed during inspection. In addition, other points of significance such as locations of service connections, unusual conditions, roots, storm sewer connections, damaged pipe, presence of scale and corrosion and other discernible features will be recorded and a copy of such records in both hard copy and digital format will be supplied to the Engineer. The digital records must be in a Microsoft Database format (.mdb file extension) or other format approved by the Engineer. A key to all observations used shall be included on each log sheet.

The locations of all the defective areas to be repaired will be identified by logging the distance frame at each defect or point of interest measured from the center of the starting manhole to the plane of focus of the camera. The importance of accurate distance measurements is emphasized. Confirmation of measurement for location of defects shall be above ground by means of a meter device. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape or other suitable device, and the accuracy shall be satisfactory to the Engineer. Marking on the cable or the like, which would require interpolation for depth of manhole, will not be allowed.

The purpose of DVD recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. DVD recording playback shall be at the same speed that it was recorded. DVDs shall be considered property of the Owner and the Contractor shall possess backup copy of all DVDs until completion of the Contract. All CCTV work done must be recorded on DVD's using the software Visual Pipes and the Contractor must supply the LFUCG a readable copy of said software to view these DVD's.

21.6 FINAL ACCEPTANCE

Acceptance of this portion of work shall be made upon the successful review of the DVD submitted to the LFUCG. If the DVDs are of such poor quality and/or the sewer line needs additional cleaning that the Owner is unable to evaluate the condition of the sewer line or to locate service connections, the Contractor shall be required to re-televise and provide a suitable DVD of the line at no additional cost. If a suitable DVD cannot be provided of such quality that the Owner can review it, no payment shall be made for additional cleaning and/or closed circuit television (CCTV). Also, no payment shall be made for portions of lines not televised or portions where manholes cannot be negotiated with the television camera.

21.7 BASIS OF PAYMENT

The television survey shall be at the Contractor's expense and is incidental to the installation of the pipe.

TECHNICAL SPECIFICATIONS

SECTION 22 - CLEANING AND INTERNAL INSPECTION OF SANITARY SEWER PIPE: CCTV

2.01 CLEANING:

A. GENERAL INFORMATION:

The intent of sewer line cleaning is to remove foreign materials from the lines and restore the sewer to a minimum of 95% of the original carrying capacity or as required for installation of cured-in-place liners or polyethylene slipline pipe. Since the success of the other phases of work depends a great deal on the cleanliness of the lines, the importance of this phase of the operation is emphasized. It is recognized that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. Should such conditions be encountered, the Contractor will not be required to clean those specific manhole sections. If, however, in the course of normal cleaning operations, damage does result from pre-existing and unforeseen conditions such as broken pipe, the Contractor may be responsible. The Contractor should take every precaution to prevent accidental damage to the sewers being cleaned.

B. METHODS:

The designated sewer manhole sections shall be cleaned using a high-velocity jet. Selection of the equipment used shall be based on the conditions of the sewers at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. Extreme care should be taken to prevent flooding of public/private property. If, again successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned and the Engineer notified.

A. EQUIPMENT:

High-Velocity Jet (Hydrocleaning) Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole wall and floors. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall have minimum of 500 feet of 1-inch ID high-pressure hose, a minimum capacity of 60 gallons per minute (GPM), and a working pressure of at least 1,200 pounds per square inch (PSI). The equipment shall carry its own water tank capable of holding a minimum of 900 gallons, auxiliary engines, pumps and

hydraulically driven hose reel. The equipment may be either truck or trailer mounted as long as it adequately accomplishes the cleaning.

All controls shall be located so that the equipment can be operated above ground with minimal interference to traffic and/or danger to the operator.

B. MECHANICAL ROOT REMOVAL:

Roots shall be removed in the designated sections where root intrusion is a problem. Special attention should be used during the cleaning operation to assure complete removal of roots from joints. Any roots that could prevent the proper installation of cured-in-place liners or polyethylene slipline pipe shall be removed. Procedures shall include the use of mechanical equipment such as root augers, porcupine drags or similar equipment.

The root auger equipment shall be approximately the same diameter as the sewer being cleaned. The auger(s) shall be kept sharp and have an attachment mounted ahead of the cutter that will permit the tool to "ride into" the next length of pipe rather than be stopped by an irregularity or offset in the pipe wall.

The porcupine drag shall be of a smaller diameter than the sewer being cleaned. The porcupine shall have stiff wire bristles that project an adequate distance so as to contact the sewer walls and effectively remove the majority of roots encountered.

C. HEAVY CLEANING:

In the event that the hydraulic cleaning effort for a single line segment requires more than one hour to successfully remove all dirt, grease, rocks, sand, and other materials (excluding roots), the sewer line shall be considered in need of heavy cleaning subject to the approval of the Engineer, and will be paid on that basis.

D. MATERIAL REMOVAL:

All sand, rocks, roots, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to downstream manhole sections could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment and shall not be permitted.

The Contractor shall furnish all equipment and appurtenances required for removal of the debris from the sewer system. No extra payment will be made for removing or disposing of the debris since this is considered a part of the cleaning scope of work.

All materials shall be removed from the site no less often than at the end of each workday. Under NO circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work except in totally enclosed containers approved by the Engineer.

E. DISPOSAL OF DEBRIS:

Unit prices for cleaning shall include the cost of trapping and removing any and all roots, sediments, and residual wastes from sewer systems and manholes as cleaning progresses. Where a hydraulic jet sewer cleaner is used to scour and flush sewer lines, a vacuum unit or other suitable method as approved by the Engineer shall be used in conjunction with the hydraulic jet cleaner to remove and dewater the suspended matter from the downstream manhole.

The Contractor shall provide for adequate transportation and satisfactory disposal of the debris removed from the system.

F. ACCESSIBILITY OF WATER FOR CLEANING:

The Contractor shall be required to obtain all fresh water necessary for performance of work under this contract. Section 1.19 of these Technical Specifications provides a local telephone number for Kentucky American Water Company to make arrangements for fresh water supplies.

G. PROTRUDING TAP REMOVAL

Protruding taps shall be removed in the designated sections where service lateral pipe intrusion is a problem and specifically requested by the Engineer in writing. A power driven cutting device shall be used to cut the service lateral pipe to a length of ¼ inch or less intrusion. Monitoring of this process through CCTV is necessary to prevent damage to the sewer pipe and/or service lateral pipe. If damage does result from operator negligence, the Contractor will be responsible for making any repairs. The Contractor should take every precaution to prevent accidental damage to the sewer pipe. The CCTV inspection is to be included in the Protruding Tap Removal line item price and the videotape shall be submitted to the Engineer within one week after the repair is completed.

J. FINAL ACCEPTANCE:

Acceptance of this portion of the work shall be made upon the successful completion of the subsequent internal television inspection and shall be to the satisfaction of the Engineer. Where cleaning is not found to be satisfactory, additional cleaning, up to three passes may be required by the Engineer at no cost to the Owner.

If cured-in-place liner is to follow the television inspection, particular attention shall be given to the adequacy of the cleaning to insure that the condition of the host pipe shall be acceptable for liner installation.

2.02 INTERNAL INSPECTION:

A. GENERAL:

All lines designated by the Engineer shall be internally inspected. The purpose of the inspection is to locate structural damage that may be present in the collection pipe.

After cleaning, the collection pipe shall be visually inspected by means of closed circuit television. The inspection will be done one pipe section at a time and the flow in the section being inspected will be suitably controlled as specified. (See Section 3: SEWER FLOW CONTROL.)

Any structural damage found in the collection pipe shall be documented and the Engineer should be notified immediately. The Engineer and Owner will evaluate the damage and, if cost-effective, the Engineer will notify the Contractor in writing to proceed with additional repairs. These repairs will be made at the unit prices shown on the Contractor's Bid Proposal.

The Owner makes no guarantee that all of the sanitary sewers to be entered are clear for the passage of a camera. The methods used for securing passage of the camera are to be at the option of the Contractor, and the costs must be included in the bid price for television inspection. The cost of retrieving the television camera, under all circumstances, when it becomes lodged during inspection, shall be incidental to this portion of the work.

B. EQUIPMENT:

The television camera used for the inspection shall be one specifically designed and constructed for such inspection. The camera shall be small enough to pass through a six (6) inch diameter sewer and should be able to perform pan/tilt or pan/rotate operations. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operable in 100 percent humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, equipment shall be removed and no payment made for unsatisfactory inspection. Videotapes shall be VHS format and shall be recorded at standard speed.

The camera monitor shall be located within a vehicle that will accommodate three people to watch the sewer line inspection. The Engineer and Owner shall have access to view the television monitor at all times.

A skilled technician shall control the operation of the equipment from a control panel located in the vehicle and shall have control of the movement of the television camera at all times. This may be accomplished by means of a self-propelled camera unit, remote-control winches, by telephone or other suitable means of communications between the winches at either end of the line segment being inspected.

C. RECOMMENDED METHOD FOR INTERNAL INSPECTION:

The camera shall be moved through the sewers in the downstream direction at a uniform rate not to exceed 30 ft./min., stopping when necessary to insure proper documentation of the sewer's condition. Manual winches, power winches, TV cable and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions may be used to move the camera through the sewer line.

The camera will stop at each service connection and use the pan and rotate controls of the camera to inspect the condition of the service lateral. The camera operator shall perform a 360-degree rotation around each service connection and a full center view down the centerline of the lateral opening. The minimum time frame spent at each lateral location is 15 seconds. Additional time may be required for defective laterals. This is not a separate pay item.

If during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole. If the camera again fails to pass through the entire manhole section, the Contractor shall notify the Engineer of the situation.

D. INSPECTION LOGS AND VIDEOTAPES:

A log approved by the Engineer shall be provided for all line inspections listing the watershed, line segment ID, line segment location, upstream manhole depth, downstream manhole depth, pipe diameter, pipe material, defects and defect ratings. Printed and digital records shall be kept by the Contractor and will clearly show the location of each infiltration point observed during inspection. In addition, other points of significance such as locations of service connections, unusual conditions, roots, storm sewer connections, damaged pipe, presence of scale and corrosion and other discernible features will be recorded and a copy of such records in both hard copy and digital format will be supplied to the Engineer on a weekly basis. The digital records must be in a Microsoft Database format (.mdb file extension) or other format approved by the Engineer. A key to all observations used shall be included on each log sheet.

The locations of all the defective areas to be repaired will be identified by logging the distance frame at each defect or point of interest measured from the center of the starting manhole to the plane of focus of the camera. The importance of accurate distance measurements is emphasized. Confirmation of measurement for location of defects shall be above ground by means of a meter device. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape or other suitable device, and the accuracy shall be satisfactory to the Engineer. Marking on the cable or the like, which would require interpolation for depth of manhole, will not be allowed.

The purpose of tape recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Videotape recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. Videotapes shall be considered property of the Owner and the Contractor shall possess backup copies of all videotapes until completion of the Contract.

E. FINAL ACCEPTANCE:

Acceptance of this portion of work shall be made upon the successful review of the VHS tapes submitted to the LFUCG. If the tapes are of such poor quality and/or the sewer line needs additional cleaning that the Owner is unable to evaluate the condition of the sewer line or to locate service connections, the Contractor shall be required to re-televise and provide a suitable tape of the line at no additional cost. If a suitable tape cannot be provided of such quality that the Owner can review it, no payment shall be made for additional cleaning and/or closed circuit television

(CCTV). Also, no payment shall be made for portions of lines not televised or portions where manholes cannot be negotiated with the television camera.

F. MISCELLANEOUS:

No later than each Thursday morning, the Contractor's Project Coordinator shall provide the Engineer with a tentative weekly schedule, and shall also provide daily notification of those areas to be investigated.

BASIS OF PAYMENT:
The television survey shall be at the Contractor's expense and is incidental to the installation of the pipe.

TECHNICAL SPECIFICATIONS

SECTION 23 – HANDRAIL

23.1 SCOPE

The Work covered by this specification consists of furnishing all materials, equipment, and labor for erecting handrail as specified on the construction plans as indicated in the LFUCG Standard Drawing 316. All statements included with the standard drawing are pertinent with. Payment for the Project Sign will be as indicated below.

23.2 BASIS OF PAYMENT

Accepted quantities for Handrail will be paid for at the Contract Unit Price per Linear Foot as quoted and this shall be full compensation for all Work required under this Section. All labor, materials, equipment, and excavation shall be incidental to the installation of handrail.

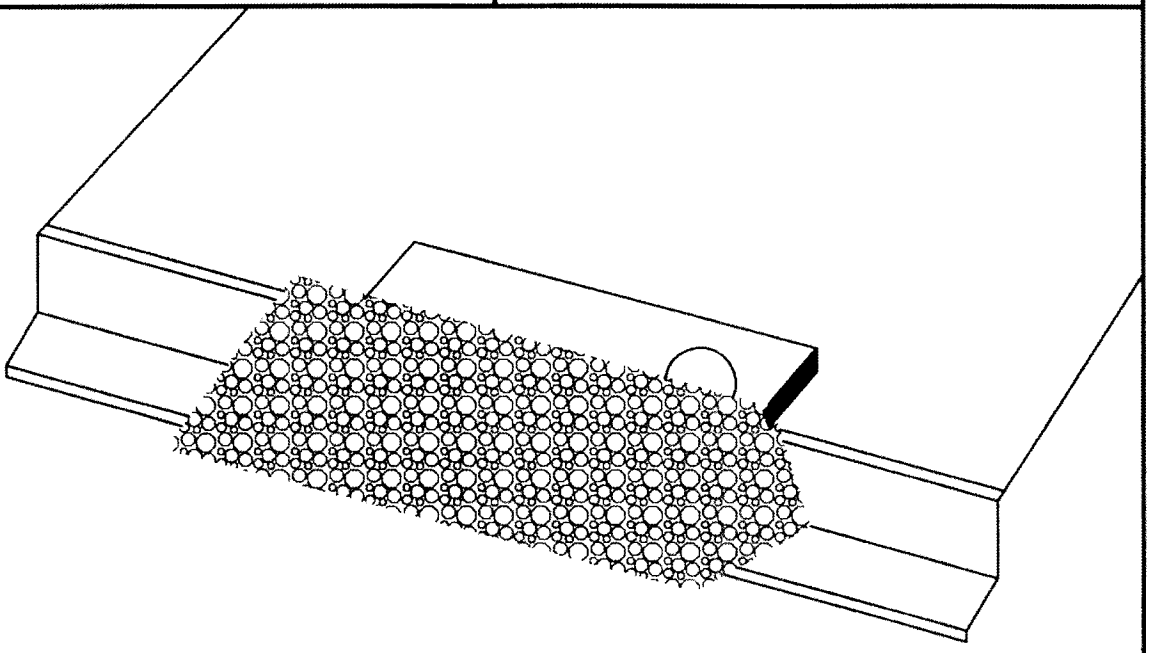
APPENDIX A

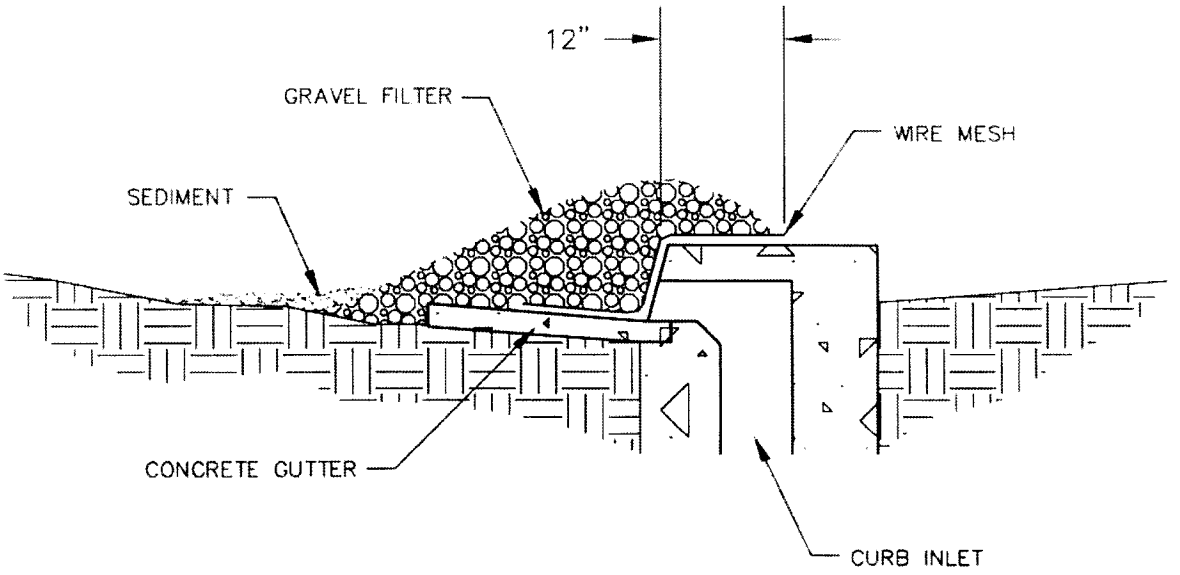
STORMWATER MANUAL

FIGURE 11-24

GRAVEL CURB INLET SEDIMENT FILTER

(EFFECTIVE DATE 8/29/11)



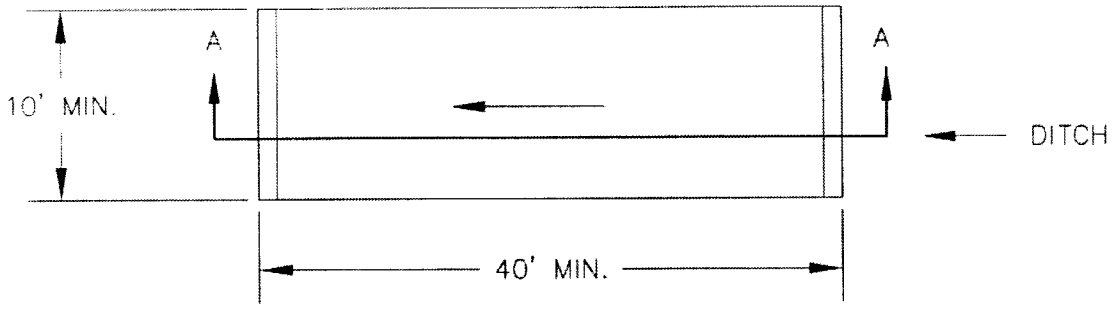


STORMWATER MANUAL

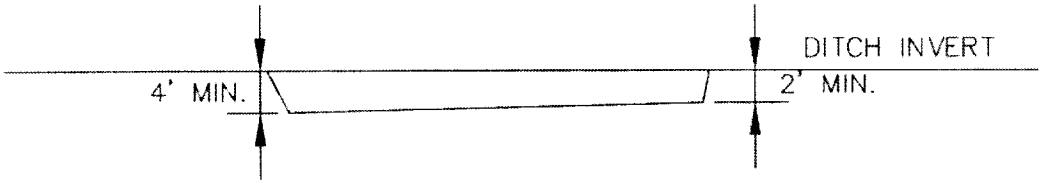
FIGURE 11–18

SEDIMENT TRAP

(EFFECTIVE DATE 8/29/11)



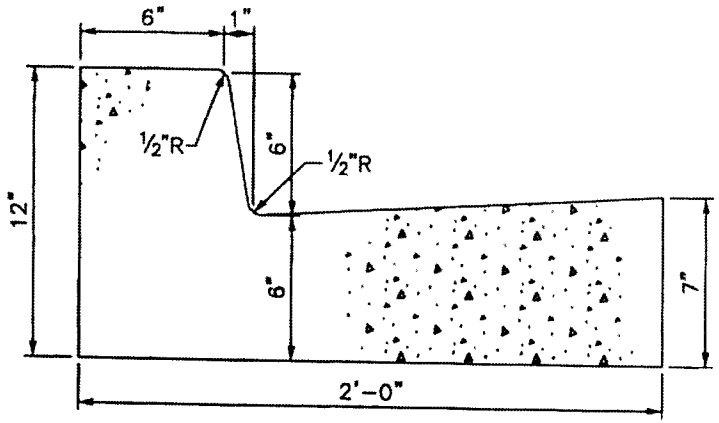
PLAN VIEW



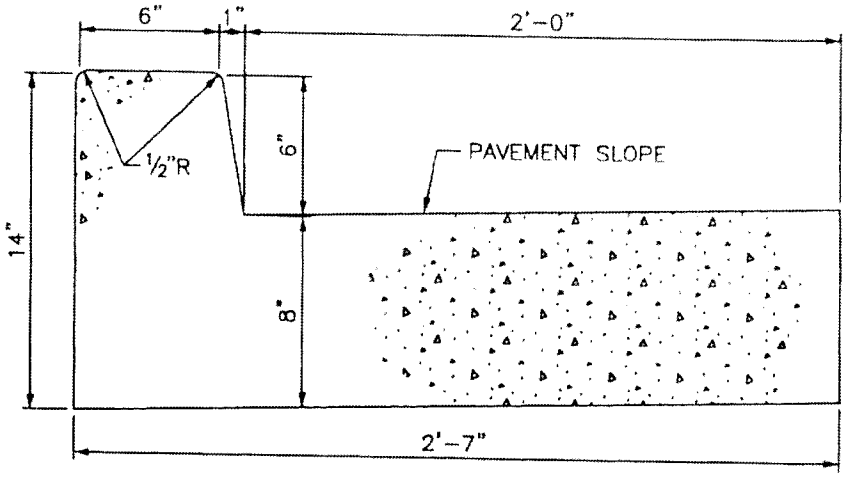
SECTION A–A

NOTES:

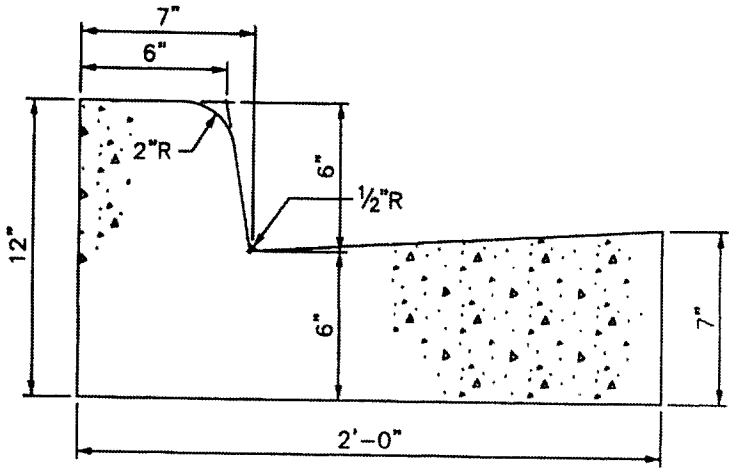
1) THE SIZE, SHAPE AND LOCATION OF TRAP MAY BE ADJUSTED FROM THAT SHOWN IN THE CONSTRUCTION PLANS, AS DIRECTED BY THE ENGINEER.
2) THE SEDIMENT TRAP MAY BE CONSTRUCTED AS DIRECTED BY THE ENGINEER AS LONG AS THE AREA AND DEPTH IS AT LEAST AS THAT INDICATED ON THE PLANS.
3) SEDIMENT TRAP SHALL BE CONSTRUCTED BY EXCAVATING THE BASIN IN NATURAL OR EXCAVATED CHANNELS. SEDIMENT DEPOSITS IN TRAP SHALL BE REMOVED EACH TIME THE TRAP IS APPROXIMATELY 50 PERCENT FILLED. WHEN THEIR USEFULNESS HAS ENDED, THE TRAPS SHALL BE REMOVED, SURPLUS MATERIAL DISPOSED OF AND THE ENTIRE DISTURBED AREA SHALL BE SEEDED AND PROTECTED, OR SODDED, AS DIRECTED. SEDIMENT TRAPS MAY REMAIN IN PLACE UPON COMPLETION OF THE PROJECT ONLY WHEN PERMITTED BY THE ENGINEER OR THE PLANS.



TYPE 1



TYPE 2



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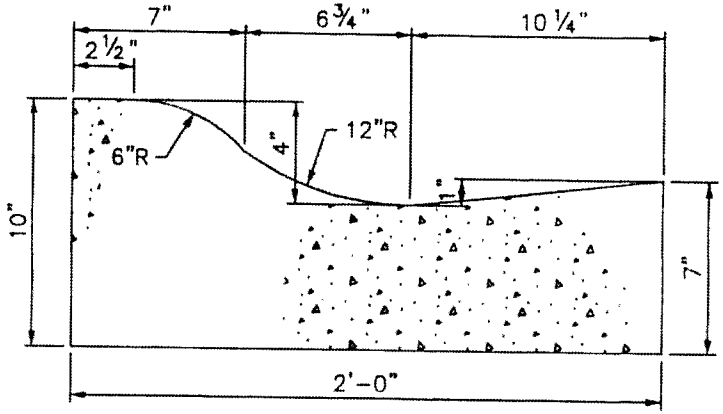


TYPE 4
(RESIDENTIAL LOCAL STREETS ONLY)

NOTES:

1. CONCRETE SHALL BE KDOT CLASS "A".
2. SAWED CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 20 FEET, WITH A MIN. DEPTH OF 3", IN ACCORDANCE WITH KDOT STANDARD SPECIFICATION.
3. EXPANSION JOINTS SHALL BE CONSTRUCTED AT ALL BREAKS IN ALIGNMENT, AT CONTACT WITH NEW OR EXISTING CONCRETE, AT ALL DRAINAGE INLETS, AT THE BEGINING AND ENDING POINTS OF CURVES, AND NOT TO EXCEED 200' MAXIMUM SPACING FOR SLIP FORM APPLICATION AND 30' MAXIMUM SPACING FOR HAND PLACED.
4. ALL CONCRETE SHALL BE CURED WITH WHITE PIGMENTED MEMBRANE FORMING COMPOUND (AASHTO M 148, TYPE 2).

NO.	DATE	REVISION DESCRIPTION	BY

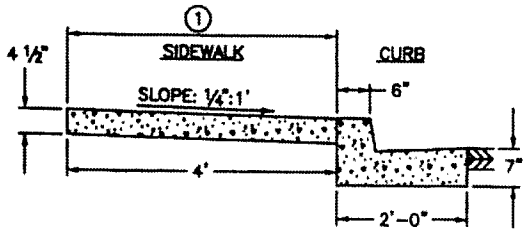
DIVISION OF ENGINEERING

CURB & GUTTER

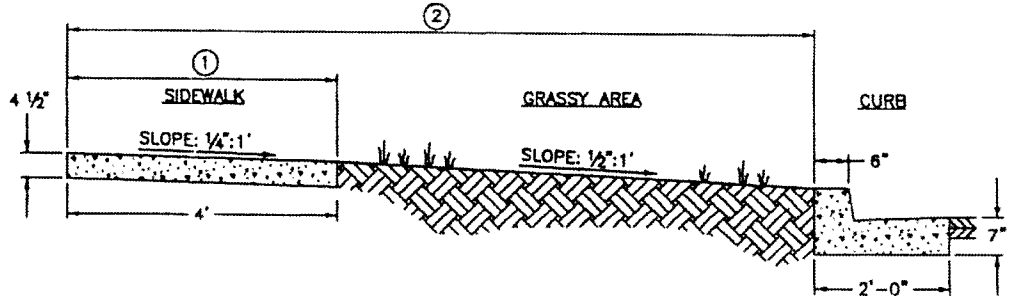
STANDARD DRAWING NO. 301

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08



SIDEWALK/CURB AND GUTTER



SIDEWALK/CURB AND GUTTER
WITH GRASS UTILITY STRIP

NOTES:

1. CONCRETE SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED ON A THOROUGHLY COMPACTED SUB-GRADE AND SHALL BE FOUR AND ONE HALF (4 ½) INCHES IN THICKNESS AND A MINIMUM WIDTH OF FOUR (4) FEET. CONCRETE SHALL HAVE SPECIFICATIONS FOR CLASS "A", KENTUCKY DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS, CURRENT EDITION. WHITE PIGMENTED (TYPE 2, CLASS "A" OR "B") CURING COMPOUND IS REQUIRED (ALSO KENTUCKY DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS, CURRENT EDITION).
2. EXPANSION JOINTS SHALL BE PLACED AT THIRTY-TWO (32) FOOT INTERVALS. IN EXISTING NEIGHBORHOODS, EXPANSION MATERIAL SHALL BE PLACED AT THE BEGINNING AND END OF NEWLY CONSTRUCTED AREAS.
3. THE SIDEWALKS SHALL BE PLACED ADJACENT TO THE STREET RIGHT-OF-WAY LINE. SLOPE TOWARD CURB SHALL BE ONE QUARTER (¼) OF AN INCH TO THE FOOT. CONSTRUCTION IN EXISTING NEIGHBORHOODS SHALL REQUIRE THE CONTRACTOR TO MATCH EXISTING GRADE AND SIDEWALK WIDTH UNLESS SPECIFIED OTHERWISE BY THE DIVISION OF ENGINEERING.

SHEET NOTES:

① NORMAL SIDEWALK WIDTH SHALL BE 4' UNLESS CHANGE IS AUTHORIZED BY URBAN COUNTY ENGINEER'S OFFICE.

② DISTANCE WILL VARY WITH ROAD CROSS-SECTION.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

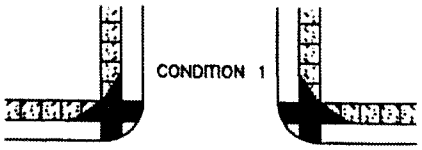
SIDEWALK CONSTRUCTION SPECIFICATIONS

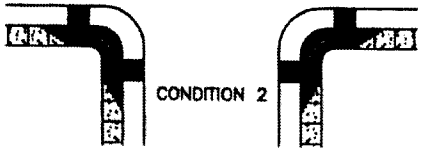
STANDARD DRAWING NO. 303

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

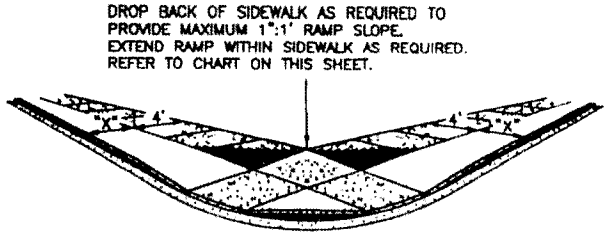
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



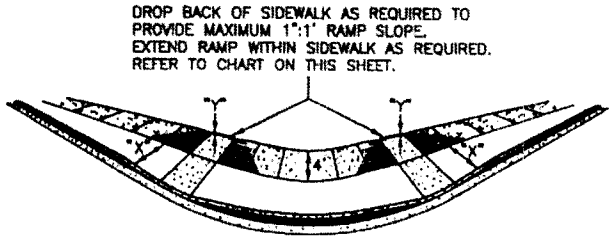


RAMP TYPE 1

NORMAL TREATMENT FOR ARTERIALS AND SIGNALIZED INTERSECTIONS



RAMP TYPE 1 CONDITION 1



RAMP TYPE 1 CONDITION 2

NOTE:
FOR USE WITH 6" HEADER CURB OR 6" CURB AND GUTTER

UTILITY STRIP WIDTH "X" ①	BACK OF 4' SIDEWALK DROP FROM NORMAL "Y"* ②
0	3"
1	2 1/2"
2	2"
3	1 1/2"
4	1"
5	1/2"
≥6	0

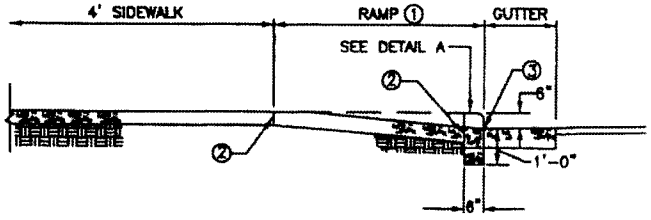
① 1/2":1' CROSS SLOPE ② 1/4":1' CROSS SLOPE
* WHERE ROLL CURB IS USED, "Y" DOES NOT APPLY.

NOTES:

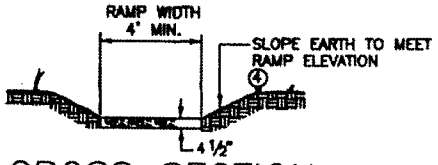
1. INLET LOCATIONS WILL VARY, DEPENDENT ON CROSSWALK AND RAMP LOCATION.
2. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. STEP-SAFE® TRANSPO INDUSTRIES TILE OR ENGINEER APPROVED EQUIVALENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. THE NORMAL GUTTER LINE SHOULD BE MAINTAINED THROUGH THE RAMP.
4. RAMPS SHOULD BE LOCATED WITHIN MARKED LIMITS OF CROSSWALKS.
5. WHERE NO CURB EXISTS, STREET EDGE SHALL BE SAW CUT, OR AS DIRECTED BY L.F.U.C.G. ENGINEER.

SHEET NOTES:

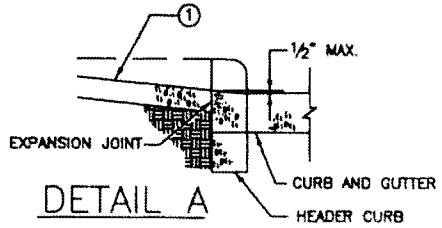
① MAXIMUM RAMP SLOPE 1":1'.
② 1/2" EXPANSION JOINT AT BACK OF CURBLINE AND SIDEWALK LINE.
③ NO BUMP PERMITTED.
④ SLOPE VARIES UNIFORMLY TO A MAXIMUM OF 1":1' AT GUTTER LINE.



PROFILE RAMP TYPE 1



CROSS SECTION RAMP TYPE 1



DETAIL A

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

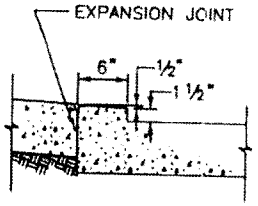
SIDEWALK
RAMP TYPE 1

STANDARD DRAWING NO. 304

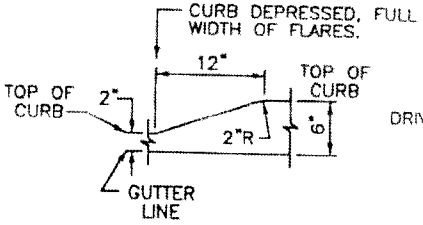
APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

MAXIMUM ALLOWABLE APRON AND DRIVEWAY WIDTHS

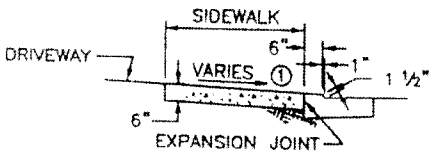
CLASSIFICATION	DRIVEWAY	APRON
SINGLE RESIDENTIAL	12'	18'
DOUBLE OR JOINT RESIDENTIAL	20'	26'



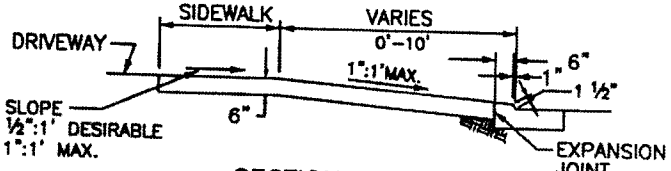
SECTION A–A



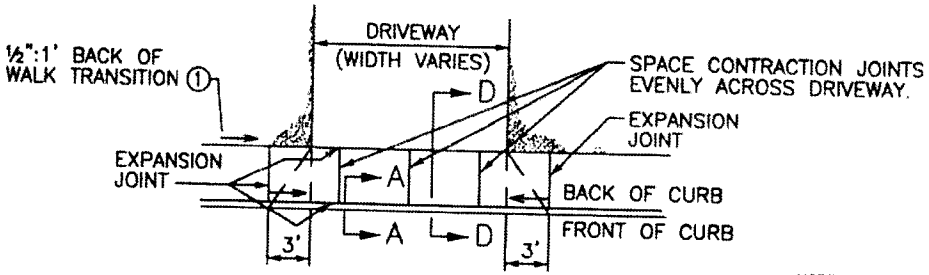
SECTION B–B



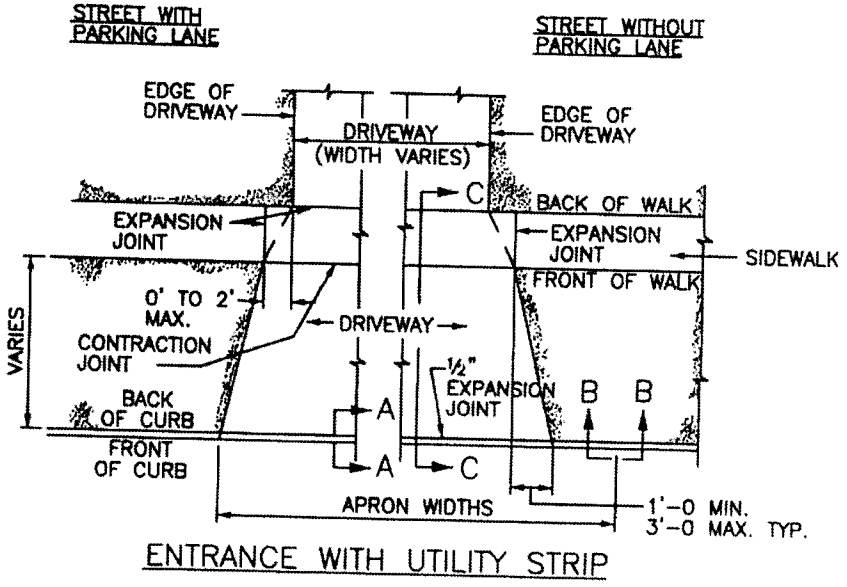
SECTION D–D



SECTION C–C



ENTRANCE WITHOUT UTILITY STRIP



ENTRANCE WITH UTILITY STRIP

NOTE:
FOR USE WITH 6" HEADER CURB OR 6" CURB AND GUTTER

BASED ON UTILITY STRIP WITH ½":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	1 ½"	7.29%	N/A
2'	1 ½"	5.21%	8.33%
4'	1 ½"	3.12%	8.33%
5'	1 ½"	2.08%	8.33%
6'	1"	2.08%	8.33%
8'	0"	2.08%	8.33%
10'	0"	2.08%	7.50%

BASED ON UTILITY STRIP WITH ¼":1' CROSS SLOPE

UTILITY STRIP WIDTH	DROP BACK OF 4' SIDEWALK	SIDEWALK SLOPE	SLOPE ON APRON
0'	1 ½"	7.29%	N/A
2'	1 ½"	4.17%	8.33%
3'	1 ½"	2.60%	8.33%
4'	1"	2.08%	8.33%
6'	0"	2.08%	7.64%
8'	0"	2.08%	6.25%
10'	0"	2.08%	5.42%

NOTES:

① DROP BACK OF SIDEWALK GRADE 1 ½" OVER 3' TO PROVIDE A MAXIMUM SLOPE OF 1":1'.

2. PROVIDE A SAWED JOINT ALONG CENTER LINE OF APRON.
3. MAXIMUM DROP AT BACK OF SIDEWALK SHALL NOT EXCEED 1 ½".
4. MAXIMUM CROSS SLOPE ON SIDEWALK SHALL NOT EXCEED 1":1' (8.3%).
5. MAXIMUM SLOPE ON APRON SHALL NOT EXCEED 1":1' (8.3%).
6. ENTIRE APRON FROM BACK OF CURB TO BACK OF SIDEWALK SHALL BE CONSTRUCTED WITH A SINGLE POUR.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

RESIDENTIAL ENTRANCE DETAILS

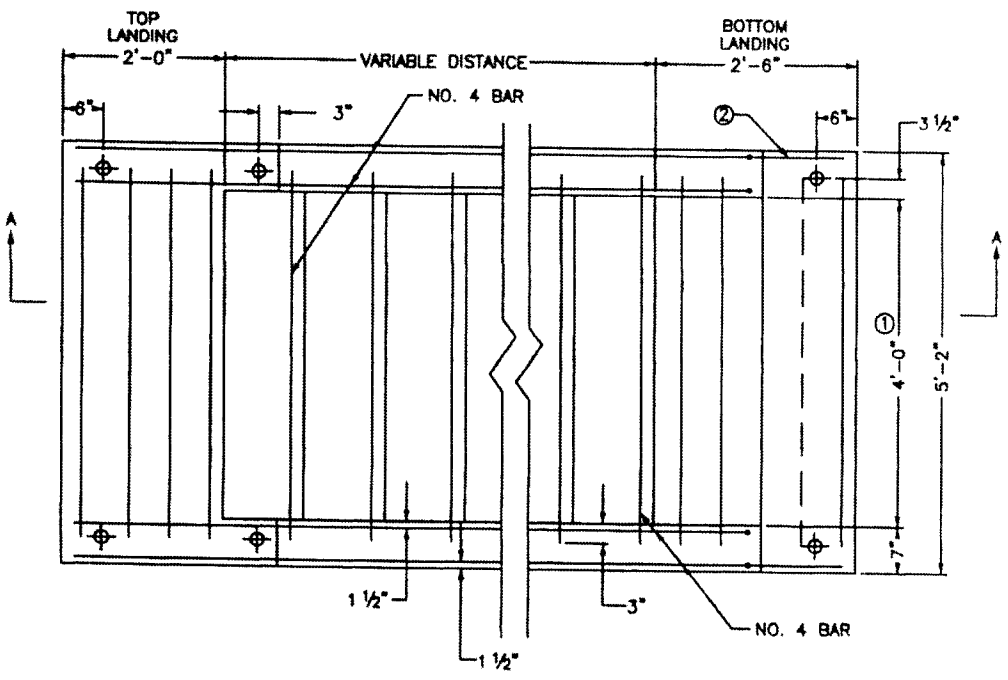
STANDARD DRAWING NO. 307

APPROVED [signature] DATE 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER [signature] DATE 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PLAN

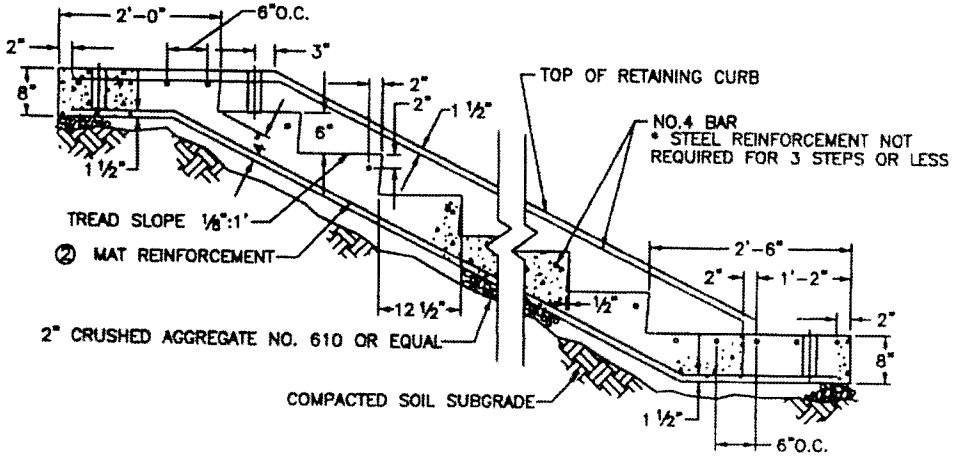
NOTES:

1. MAT REINFORCEMENT ②
   NO. 4 REINFORCEMENT BARS, LONG. BARS 6"O.C. AND TRANSV. BARS 12"O.C., MIN. GRADE 40, OR WELDED WIRE FABRIC–6X6–W4XW4, 58 LBS./100 SQ. FT.
2. NO. 4 REINFORCEMENT BARS ADDITIONALLY AS SHOWN.
3. ROUND ALL EXPOSED EDGES AND CORNERS ¼" R.
4. MAT REINFORCEMENT IN BOTTOM OF THE STEPS SHALL BE WIRE FABRIC OR BAR MAT ② .
5. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.

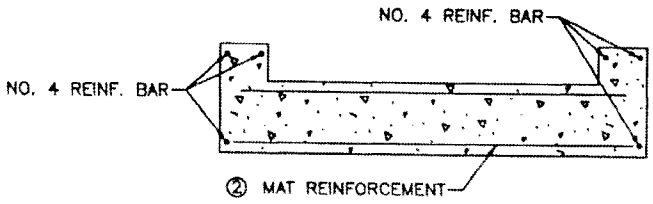
TABLE OF QUANTITIES

SLOPE	LOCATION	ADDITIONAL NO. 4 BAR REINF. (LBS)		MAT REINFORCEMENT WIRE FABRIC(SQ.FT.)		MAT REINFORCEMENT BAR MAT (LBS)		CU. YDS. CLASS "A" CONCRETE	
		4' WIDTH	①	4' WIDTH	①	4' WIDTH	①	4' WIDTH	①
2:1	BOTTOM LANDING	23.547	3.340	11.776	2.375	27.388	5.177	0.337	0.059
	INTERMEDIATE STEP	8.015	1.336	5.991	1.208	12.191	2.283	0.16	0.025
	TOP LANDING	22.483	3.340	9.504	1.917	20.708	3.897	0.265	0.051
1½:1	BOTTOM LANDING	23.603	3.340	12.602	2.542	28.613	5.400	0.36	0.062
	INTERMEDIATE STEP	7.431	1.336	5.268	1.063	11.119	2.088	0.17	0.027
	TOP LANDING	22.545	3.340	9.710	1.958	21.014	3.952	0.281	0.054

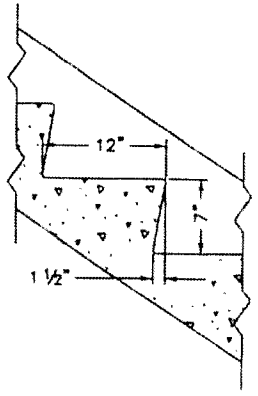
① APPROXIMATE QUANTITY TO ADD FOR EACH ADDITIONAL FOOT OF WIDTH OVER 4'–0".



SECTION A–A 2:1 SLOPE



STEP CROSS SECTION



STEP DETAIL FOR 1 ½:1 SLOPE

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CONCRETE STEPS

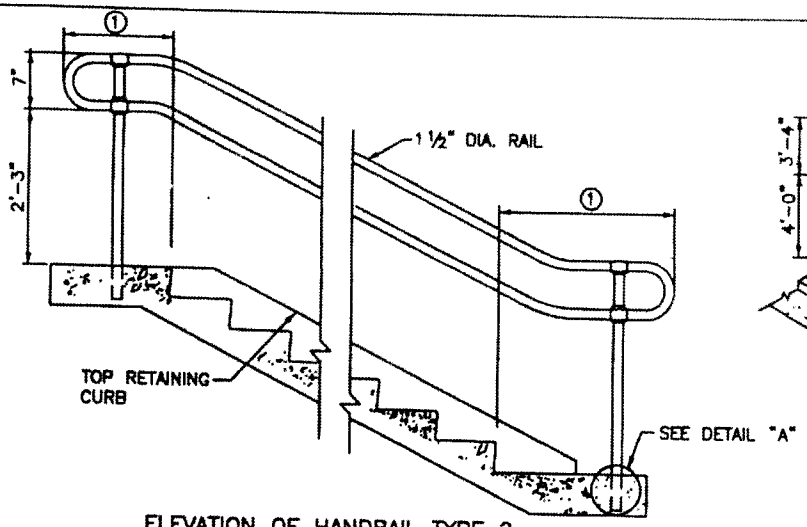
STANDARD DRAWING NO. 315

APPROVED _____ DATE 5/1/08

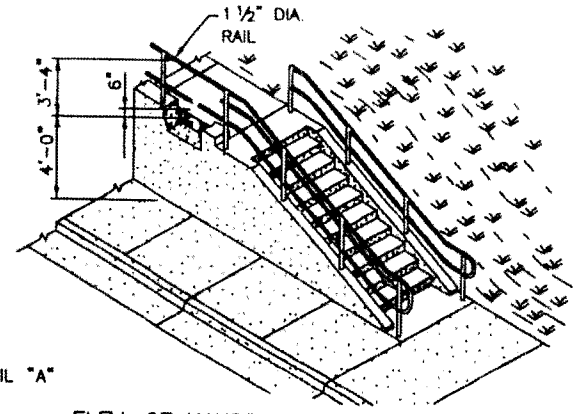
URBAN COUNTY ENGINEER _____

COMMISSIONER _____ DATE 5/1/08

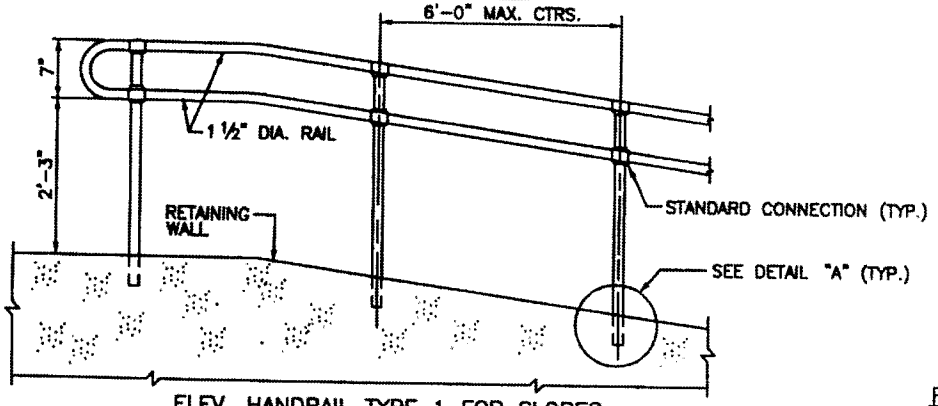
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



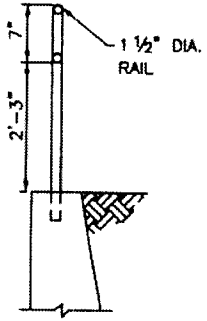
ELEVATION OF HANDRAIL TYPE 2



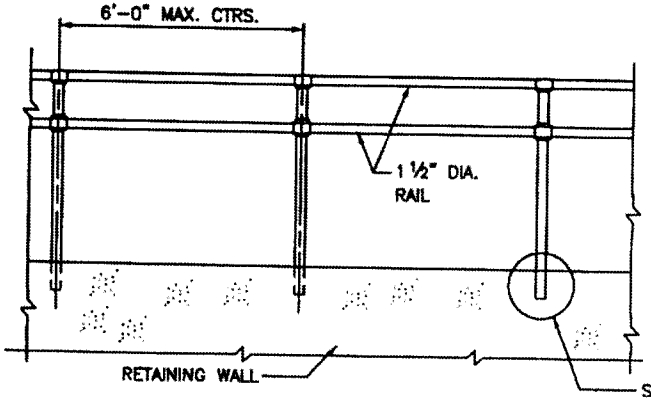
ELEV. OF HANDRAIL TYPE 1



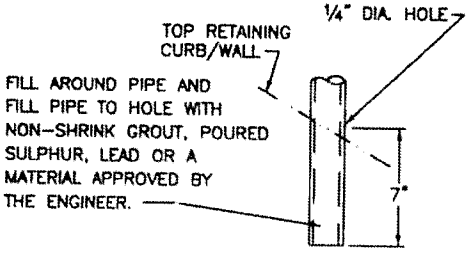
ELEV. HANDRAIL TYPE 1 FOR SLOPES



RT. SIDE ELEVATION



ELEVATION OF HANDRAIL TYPE 2



DETAIL "A"

NOTES:

1. ALL HANDRAILS SHALL COMPLY WITH THE LATEST EDITION OF THE AMERICANS WITH DISABILITIES ACT (ADA) GUIDELINES.
2. ANCHOR POST IN CORED OR FORMED HOLES (SEE DETAIL "A").
3. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.
4. HANDRAIL USED AS A TOP HANDRAIL ON STEPS AND HANDRAIL USED ON A RETAINING WALL SHALL BE REQUIRED WHEN THE ADJACENT FLOOR, GROUND LEVEL, ROAD, WALK, ETC. IS 4' OR MORE BELOW THE TOP OF THE RETAINING WALL. HANDRAIL SHALL BE UNIFORMLY CONSTRUCTED.
5. THE TOP OF THE RETAINING WALL OR CURB SHALL BE A MINIMUM OF 6" ABOVE THE ADJOINING SIDEWALK.
6. RAILS SHALL NOT ROTATE IN FITTINGS AND SHALL HAVE WELDED CONNECTIONS.
7. THE CLEAR SPACE BETWEEN HANDRAILS AND WALL SHALL BE 1½".
8. HANDRAILS SHOULD BE CONSTRUCTED OF DN 40 SCHEDULE 40 ALUMINUM PIPE IN ACCORDANCE WITH ASTM-B221 OR B210 ALLOY 6061-T6.

SHEET NOTE: ◯

① HANDRAILS SHALL EXTEND 12" BEYOND THE TOP RISER AND AT LEAST 12" PLUS THE WIDTH OF ONE TREAD BEYOND THE BOTTOM RISER. AT THE TOP, THE EXTENSION SHALL BE PARALLEL WITH THE FLOOR OR GROUND SURFACE. AT THE BOTTOM, THE HANDRAIL SHALL CONTINUE TO SLOPE FOR A DISTANCE OF THE WIDTH OF ONE TREAD FROM THE BOTTOM RISER. THE REMAINDER OF THE EXTENSION SHALL BE HORIZONTAL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

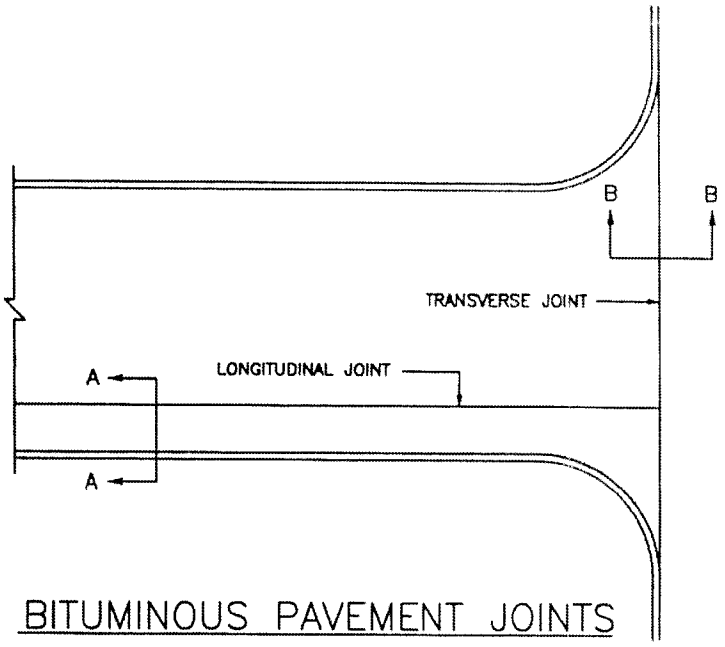
HANDRAIL

STANDARD DRAWING NO. 316

APPROVED _____ 5/1/08
URBAN DRAINAGE MANAGER DATE

_____ 5/1/08
COMMISSIONER DATE

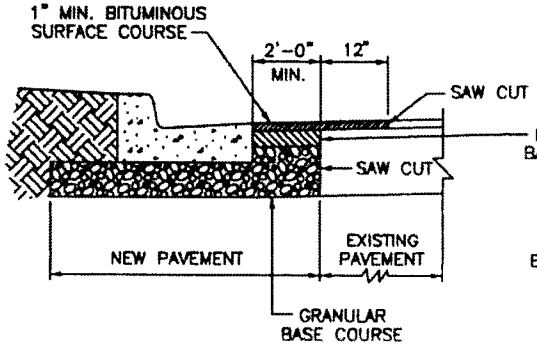
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



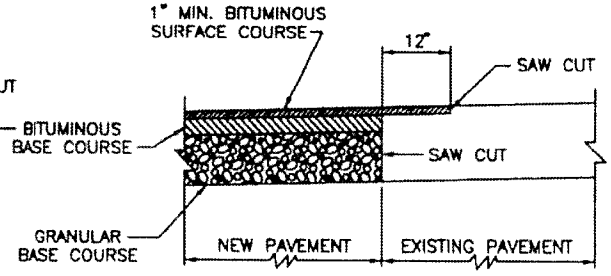
BITUMINOUS PAVEMENT JOINTS

NOTES:

1. ALL SAW-CUTS SHALL BE NEAT AND STRAIGHT.
2. IMMEDIATELY BEFORE LAYING NEW BITUMINOUS COURSES, ALL SAW CUT EDGES SHALL BE CLEANED OF DUST AND DEBRIS AND SPRAYED WITH A BITUMINOUS TACK COAT.
3. EDGE KEY SHALL NOT BE REQUIRED IF BOTH EXISTING AND NEW PAVEMENT ARE TO RECEIVE AN OVERLAY AS PART OF THIS CONTRACT.



SECTION A-A
LONGITUDINAL EDGE KEY



SECTION B-B
TRANSVERSE EDGE KEY

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

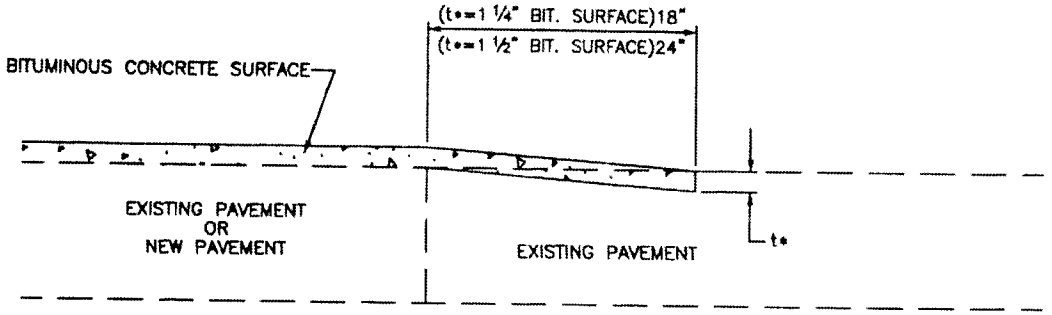
EDGE KEY

STANDARD DRAWING NO. 318

APPROVED [signature] DATE 5/1/08

URBAN COUNTY ENGINEER [signature] DATE 5/1/08

COMMISSIONER



EDGE KEY

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

TYPICAL EDGE KEY
FOR
MINIMUM OVERLAYS,
SHORT PROJECTS,
LOW SPEED

STANDARD DRAWING NO. 319

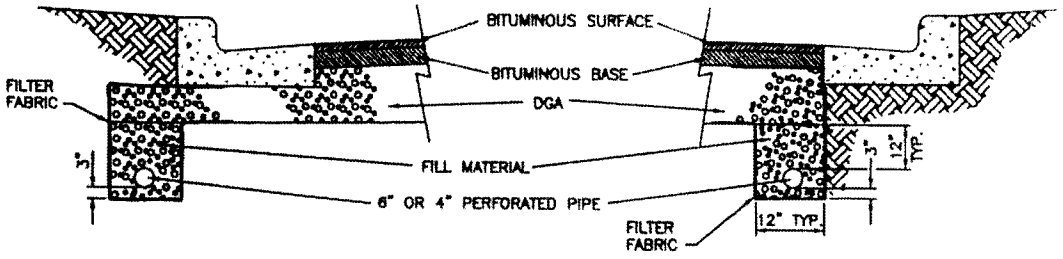
APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER _____

COMMISSIONER _____ DATE 5/1/08

TYPICAL SECTION

CASE 1

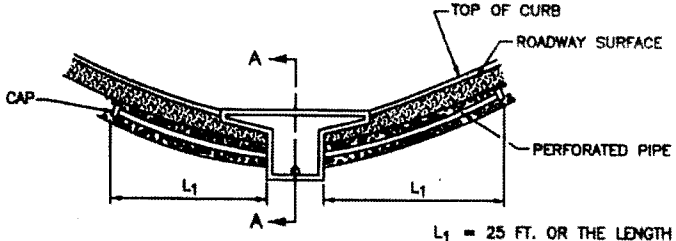


CASE 2

NOTES:

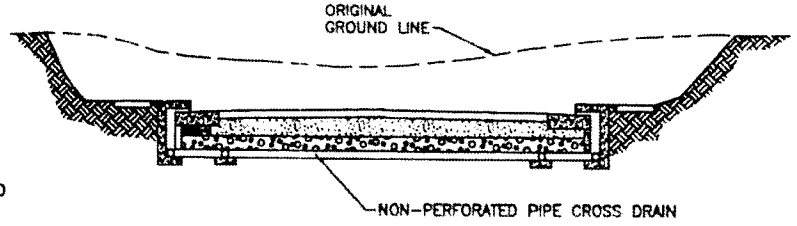
1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE SURFACING PHASE OF CONSTRUCTION, AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO CONSTRUCTING PAVING MATERIALS.
2. THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.
3. TERMINATE PERFORATED PIPE IN CATCH BASIN AT AN ELEVATION WHICH PROVIDES POSITIVE DRAINAGE (MAY REQUIRE ADDITIONAL OPENING IN CATCH BASIN WALL).
4. BACKFILL TO CONSIST OF NO. 78, 8, 9M COARSE AGGREGATE OR NATURAL SAND. THE FILL MATERIAL SHALL BE THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 6 INCHES LOOSE MEASUREMENT.
5. CONNECTIONS TO DRAINAGE STRUCTURES AND PIPE TERMINI SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE EXCEPT FOR PERFORATIONS.
6. ALL RAISED NON-PAVED MEDIANS SHALL HAVE SUBGRADE DRAINAGE ASSOCIATED WITH CURB AND GUTTER.

TYPICAL SUBGRADE DRAINAGE LOCATIONS

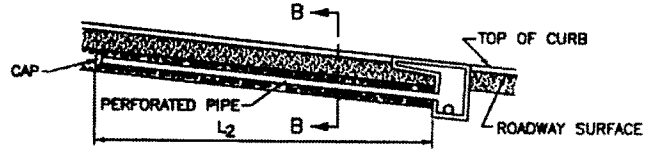


SAG VERTICAL CURVE

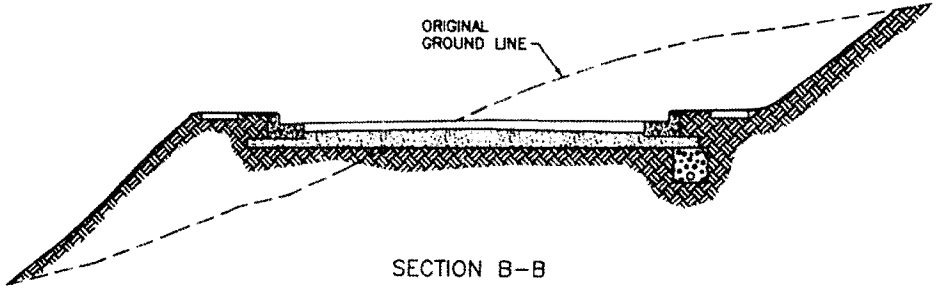
L_1 = 25 FT. OR THE LENGTH REQUIRED TO REACH THE 1% SLOPE POINT, WHICHEVER IS LARGER.



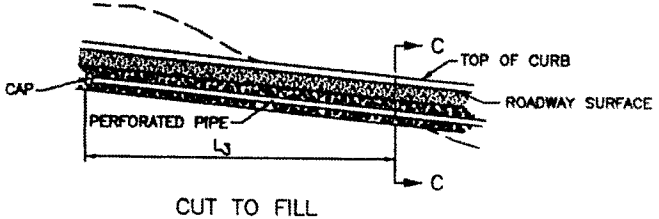
SECTION A-A



HILLSIDE L_2 = 50 FT. OR THE LENGTH TO THE CREST OF THE HILL, WHICHEVER IS LARGER.

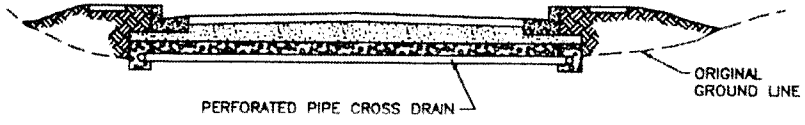


SECTION B-B



CUT TO FILL

L_3 = 25 FT. OR THE LENGTH REQUIRED TO REACH THE CREST OF THE HILL, WHICHEVER IS LARGER.



SECTION C-C

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

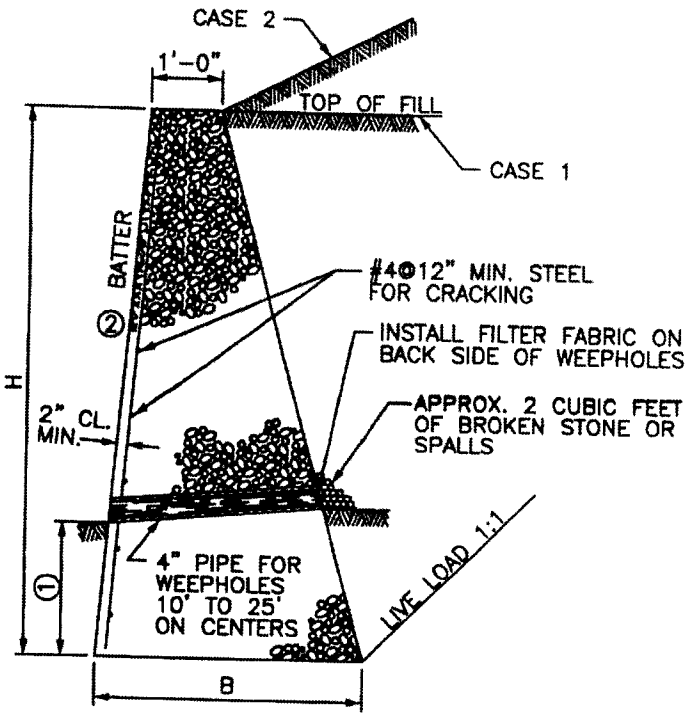
PERFORATED PIPE SUBGRADE DRAINAGE ALONG ROADWAY

STANDARD DRAWING NO. 320

APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER / COMMISSIONER _____ DATE 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



RETAINING WALL

H	B	END AREA SQ. FT.	VOLUME C.Y./L.F.
CASE 1 OR 2			
2'-6"	1'-3"	2.8125	0.1042
3'-0"	1'-6"	3.7500	0.1389
3'-6"	1'-9"	4.8125	0.1782
4'-0"	2'-0"	6.0000	0.2222
4'-6"	2'-3"	7.3125	0.2708
5'-0"	2'-6"	8.7500	0.3241
5'-6"	2'-9"	10.3125	0.3819
6'-0"	3'-0"	12.0000	0.4444
6'-6"	3'-3"	13.8125	0.5116
7'-0"	3'-6"	15.7500	0.5833
7'-6"	3'-9"	17.8125	0.6597
8'-0"	4'-0"	20.0000	0.7407
8'-6"	4'-3"	22.3125	0.8264
9'-0"	4'-6"	24.7500	0.9167
9'-6"	4'-9"	27.3125	1.0116
CASE 1			
10'-0"	5'-0"	30.0000	1.1111
10'-6"	5'-3"	32.8125	1.2153
11'-0"	5'-6"	35.7500	1.3241
11'-6"	5'-9"	38.8125	1.4375
12'-0"	6'-0"	42.0000	1.5556
CASE 2			
10'-0"	6'-0"	35.0000	1.2963
10'-6"	6'-3"	38.0625	1.4097
11'-0"	6'-6"	41.2500	1.5278
11'-6"	6'-9"	44.5625	1.6505
12'-0"	7'-0"	48.0000	1.7778

NOTES:

1. THE RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT ("H" DIMENSION) OF THE WALL IS 2'-6" TO 12'-0" PROVIDED THE FILL COMPLIES WITH THE FOLLOWING CONDITIONS:

   CASE 1 – TOP OF FILL IS LEVEL WITH TOP OF WALL.

   CASE 2 – WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES OF 2:1 OR LESS.

2. AREAS AND VOLUMES HAVE BEEN COMPUTED WITHOUT DEDUCTING FOR BEVELED EDGES OR PIPE DRAINS. WHEN A RETAINING WALL VARIES IN HEIGHT, THE PRISMOIDAL FORMULA SHALL BE USED IN COMPUTING VOLUMES.
3. GRAVITY TYPE RETAINING WALLS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
4. TRANSVERSE EXPANSION JOINTS 1/2 INCH IN WIDTH SHALL BE PLACED AT INTERVALS OF NOT OVER 30 FEET THROUGHOUT THE LENGTH OF RETAINING WALLS AND EXPANSION JOINT MATERIAL SHALL BE PLACED THEREIN. ALL EXPOSED EDGES SHALL BE BEVELED 3/4 INCH. THE WALLS SHALL NOT BE SURCHARGED EXCEPT IN SPECIAL CASES WHEREIN SPECIAL DRAWINGS WILL BE FURNISHED.

SHEET NOTES:

SPECIAL DESIGNS SHALL BE REQUIRED WHEN ANY ONE OF THE FOLLOWING CONDITIONS EXIST:

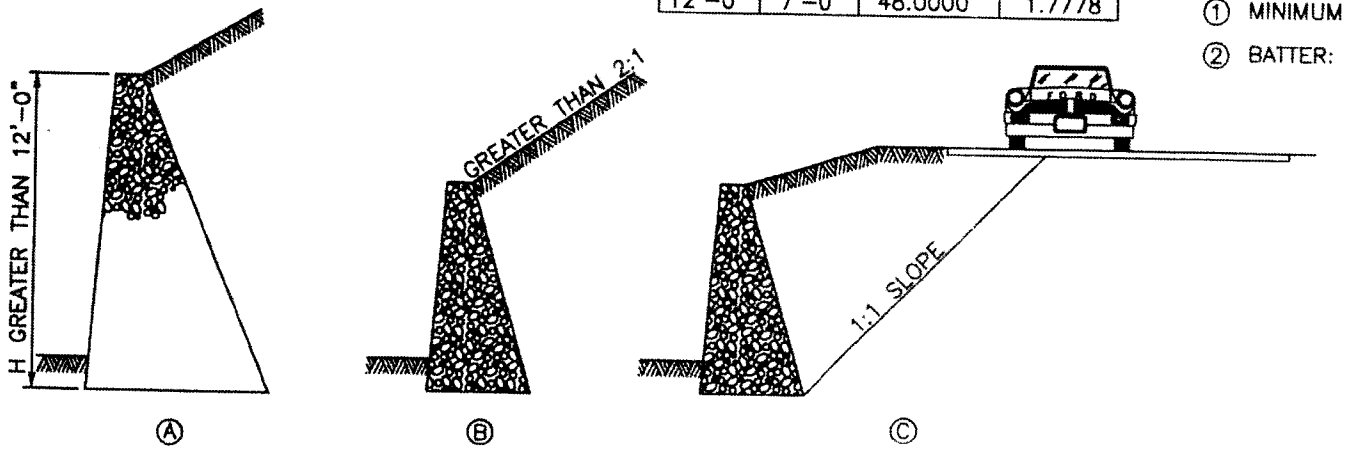
Ⓐ WALL HEIGHT IS GREATER THAN 12'-0" (CASE 1 OR CASE 2 FILL).

Ⓑ WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES GREATER THAN 2:1.

Ⓒ WALL IS SURCHARGED WITH A LIVE LOAD WITHIN THE LIMITS OF A 1:1 SLOPE EXTENDING FROM THE BASE OF THE WALL.

① MINIMUM VALUE FOR FIRM SOIL IS 2'-0".

② BATTER: H=3'-0" TO LESS THAN 5'-0" (VERTICAL)
H=5'-0" TO LESS THAN 10'-0" (1":1')
H=10'-0" TO 12'-0" (2":1')



SPECIAL DESIGNS REQUIRED

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

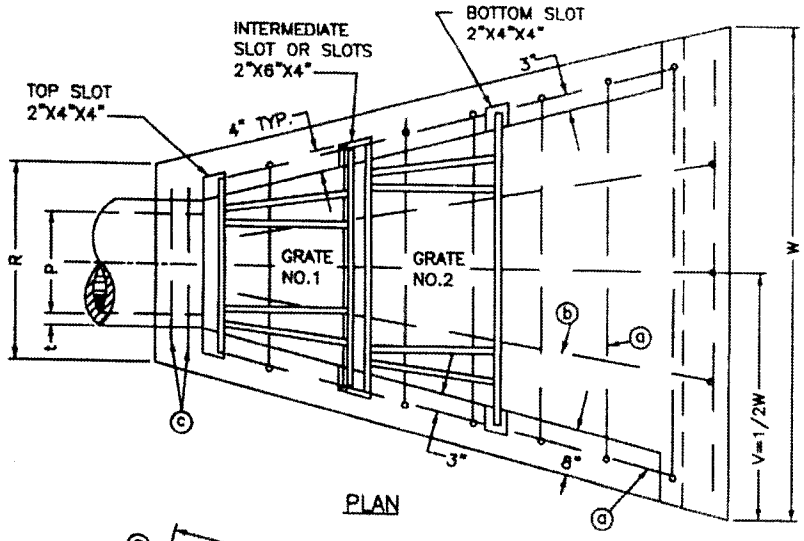
RETAINING WALL
GRAVITY TYPE

STANDARD DRAWING NO. 180

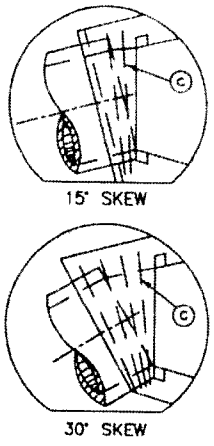
APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____
COMMISSIONER DATE

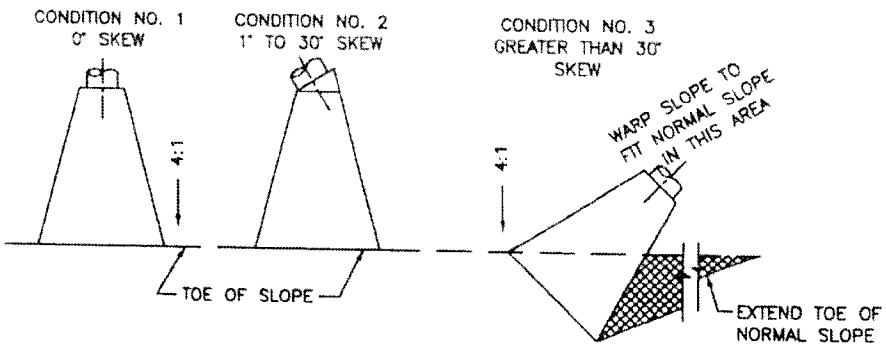
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

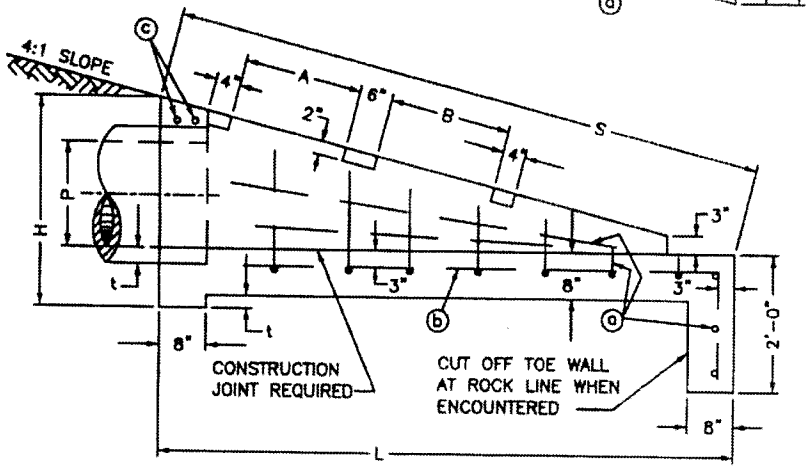


PLAN



PLAN VIEW OF STRUCTURE LOCATIONS

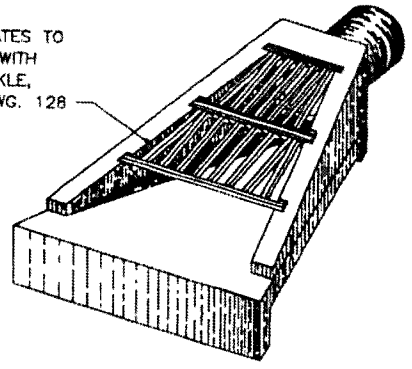




ELEVATION

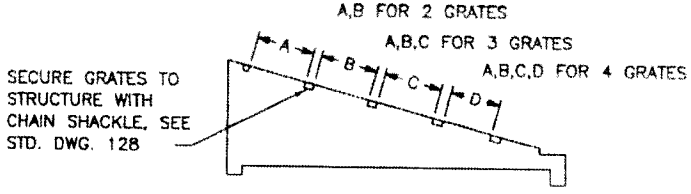
NOTES:

1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.
2. ONE ADDITIONAL (c) BAR WILL BE REQUIRED FOR EACH 15° SKEW.
3. t IS CONCRETE PIPE WALL THICKNESS.



18"–24" TRIMETRIC VIEW

DETAIL SHOWING LOCATION OF SLOTS FOR GRATES



SEE STD. DWG. 163 FOR GRATE DETAILS.

DIMENSIONS										
P	H	L	S	R	V	W	A	B	C	D
18"	3'-0"	8'-6"	8'-9 1/8"	2'-11 1/2"	3'-7 1/2"	7'-3"	1'-9"	1'-9"	–	–
24"	3'-7"	10'-8"	11'-0"	3'-6 1/2"	4'-5 1/2"	8'-11"	2'-9"	2'-9"	–	–
30"	4'-2"	12'-10"	13'-2 3/4"	4'-1 1/2"	5'-3 1/2"	10'-7"	2'-9"	2'-9"	1'-9"	–
36"	4'-9"	15'-0"	15'-5 1/2"	4'-8 1/2"	6'-1 1/2"	12'-3"	2'-9"	2'-9"	1'-9"	1'-9"

NO. OF GRATES REQ'D	
2'	3'
2	–
–	2
1	2
2	2

NO. 4 REINFORCEMENT BARS NUMBER–LENGTH AND WEIGHT				CLASS "A" CONC.
ⓐ	ⓑ	② ⓒ	LBS.	CU.YD.
14 AT 6'–5"	3 AT 8'–6"	2 AT 2'–8"	81	1.8
16 AT 8'–0"	3 AT 10'–6"	2 AT 3'–3"	111	2.7
18 AT 9'–7"	3 AT 12'–9"	2 AT 3'–10"	146	3.8
20 AT 11'–4"	3 AT 15'–0"	2 AT 4'–5"	187	5.1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SLOPED AND FLARED BOX INLET–OUTLET 18"–24"–30"–36" ALL SKEWS

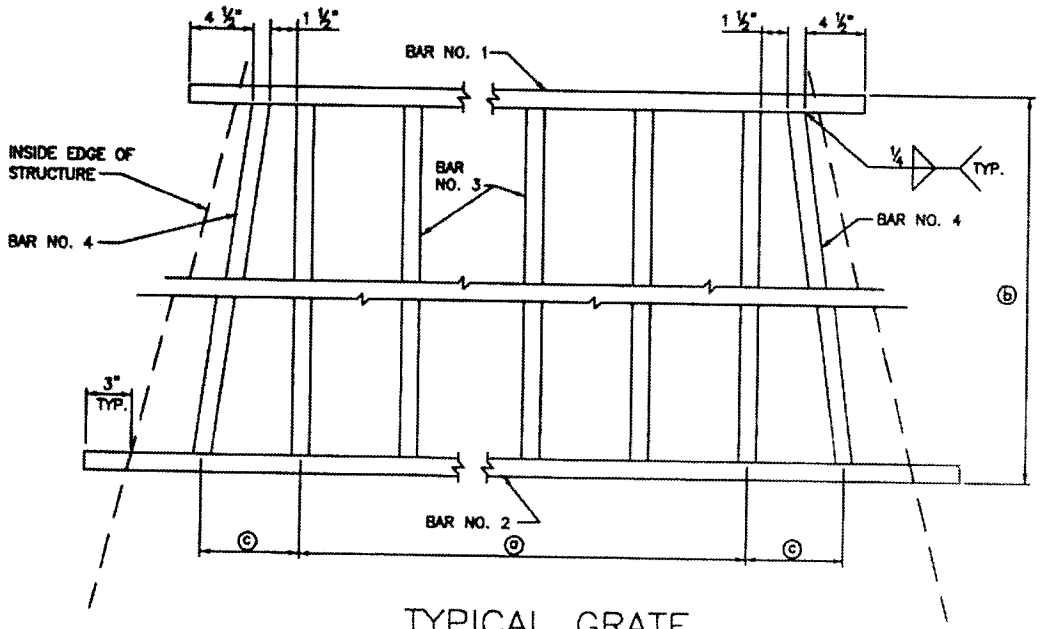
STANDARD DRAWING NO. 162

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

BOX INLET–OUTLET SIZE	GRATE		BAR NO. 1	BAR NO. 2	BAR NO. 3		BAR NO. 4	LBS. STRUCTURAL STEEL	
	NO.	SIZE	LENGTH	LENGTH	NO. BARS	LENGTH	LENGTH	EACH GRATE	TOTAL
18"	1	2'–0"	2'–6 ½"	3'–5 ¾"	4	1'–10"	1'–10 ¼"	116	272
	2	2'–0"	3'–7 ⅝"	4'–6 ⅞"	6	1'–10"	1'–10 ¼"	156	
24"	1	3'–0"	3'–1 ½"	4'–6 ⅝"	5	2'–10"	2'–10 ⅜"	187	454
	2	3'–0"	4'–8 ½"	6'–1 ⅜"	8	2'–10"	2'–10 ⅜"	267	
30"	1	3'–0"	3'–8 ½"	5'–1 ½"	6	2'–10"	2'–10 ⅜"	215	796
	2	3'–0"	5'–3 ½"	6'–8 ⅝"	9	2'–10"	2'–10 ⅜"	294	
	3	2'–0"	6'–10 ½"	7'–9 ¾"	13	1'–10"	1'–10 ¼"	287	
36"	1	3'–0"	4'–3 ½"	5'–8 ½"	7	2'–10"	2'–10 ⅜"	242	1218
	2	3'–0"	5'–10 ½"	7'–3 ⅝"	10	2'–10"	2'–10 ⅜"	321	
	3	2'–0"	7'–5 ½"	8'–4 ¾"	14	1'–10"	1'–10 ¼"	308	
	4	2'–0"	8'–6 ¾"	9'–5 ⅞"	16	1'–10"	1'–10 ¼"	347	



TYPICAL GRATE

NOTES:

ⓐ EQUALLY SPACE BARS NO. 3.

ⓑ SIZE OF GRATE EITHER 2'–0" OR 3'–0".

ⓒ 5 ½" FOR 2'–0" GRATE, 7" FOR 3'–0" GRATE.

1. ALL COMPONENTS ARE 1" x 2" STRUCTURAL STEEL BARS.
2. SEE STD. DWG. 162.
3. SECURE GRATE TO STRUCTURE WITH CHAIN SHACKLE, SEE STD. DWG. 128.

NO.	DATE	REVISION DESCRIPTION	BY

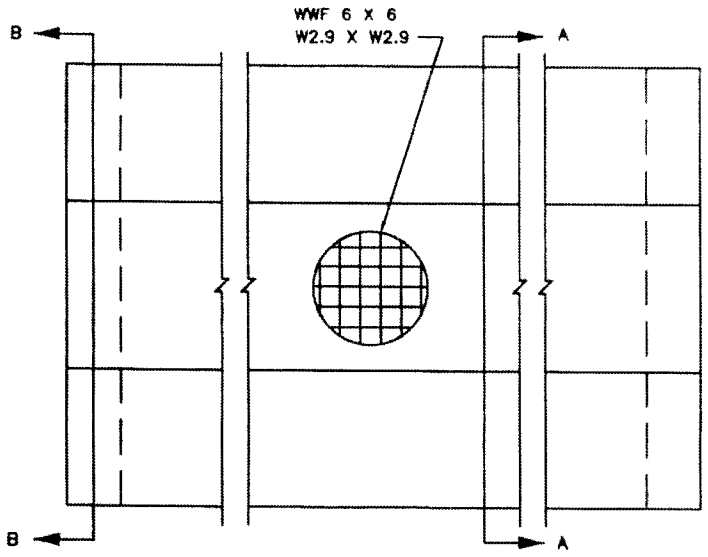
DIVISION OF ENGINEERING

GRATES FOR SLOPED AND FLARED BOX INLET–OUTLET

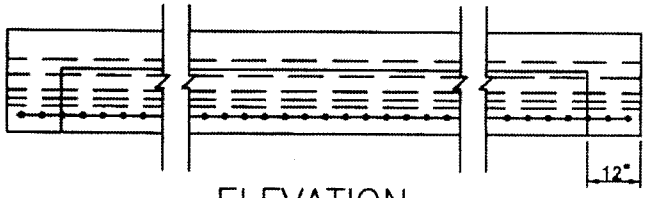
STANDARD DRAWING NO. 163

APPROVED BY _____ DATE 5/1/08
URBAN COUNTY ENGINEER

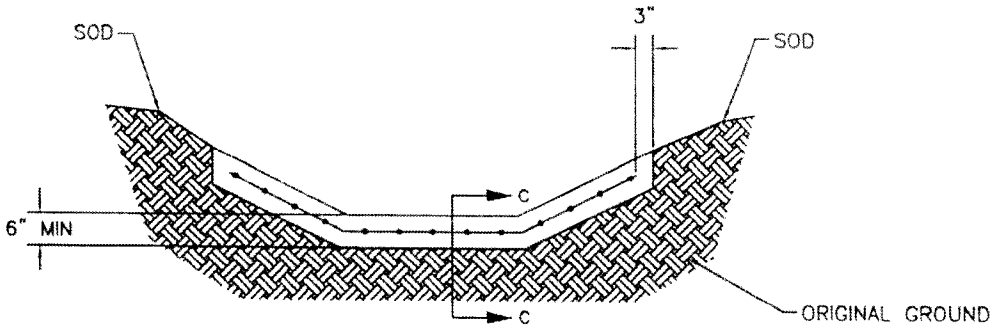
_____ DATE 5/1/08
COMMISSIONER



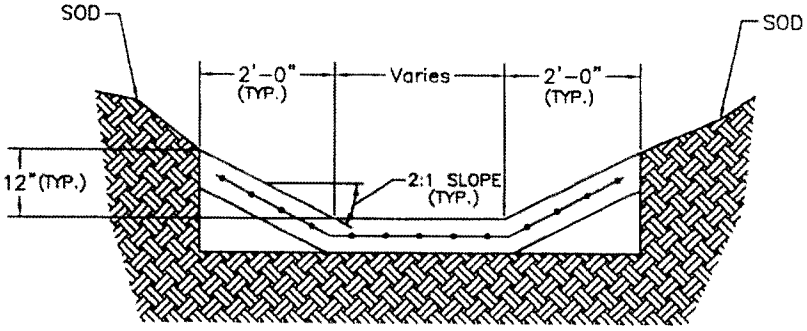
PLAN



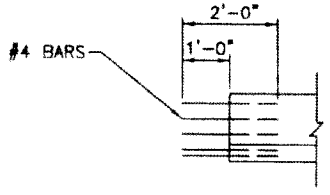
ELEVATION



SECTION A–A



SECTION B–B



SECTION C–C
(@ CONSTRUCTION JOINT)

NOTES:

1. USE "CLASS A" CONCRETE THROUGHOUT.
2. COMPACTION, FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK (USE WHITE COMPOUND).
3. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE POURING OF THE PAVED DITCH, NO. 4 TIE BARS SPACED 6" O.C. SHALL BE USED (SEE SECTION C–C).
4. INTERMEDIATE ANCHORS MAY BE REQUIRED BY THE ENGINEER FOR SPECIAL CASES. A SPECIAL DESIGN WILL BE REQUIRED IN THIS SITUATION.
5. SHOULD THE TERRAIN OF THE EXISTING GROUND BE SO THAT WATER WOULD DRAIN INTO THE DITCH FROM ONE SIDE ONLY, THEN SODDING WILL BE REQUIRED ON THAT ONE SIDE ONLY OF THE DITCH.
6. EXPANSION JOINTS & SEALER REQUIRED ON ENDS ABUTTING STRUCTURES AND ANCHORS ON ENDS NOT ABUTTING STRUCTURES.
7. IF FIBER REINFORCED CONCRETE IS USED THE WWF 6 x 6 MAY BE ELIMINATED.
8. DO NOT PLACE PAVED DITCH ON DISTURBED SOIL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

PAVED DITCH

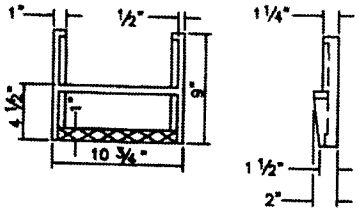
STANDARD DRAWING NO. 132

APPROVED _____ DATE 5/1/08

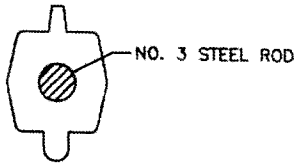
URBAN COUNTY ENGINEER _____ DATE 5/1/08

COMMISSIONER

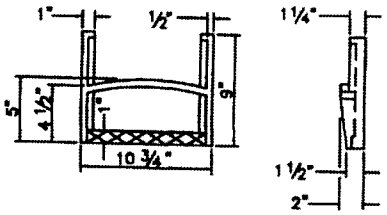
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



STEP TYPE NO. 1



SECTION B–B



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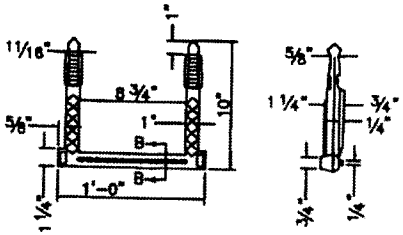
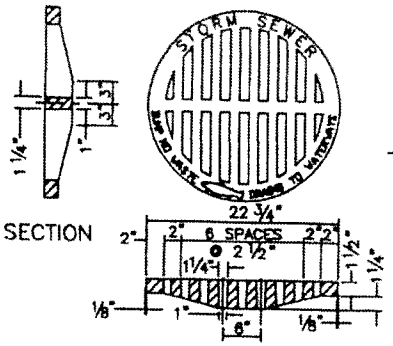


STEP TYPE NO. 3

STEP TYPE NO. 4

MANHOLE STEPS



SECTION

GRATING COVER

FRAME

SOLID COVER

MANHOLE FRAME AND COVERS

NOTES:

1. MINIMUM WEIGHT FOR THE 7" FRAME SHALL BE 185 LBS.
2. MINIMUM WEIGHT FOR THE SOLID COVER SHALL BE 120 LBS.
3. CASTINGS TO MEET ASTM A–48 CLASS 35.

NOTES:

1. STEPS SHALL BE ASPHALT COATED CAST IRON OR POLYPROPYLENE PLASTIC COATED STEEL ROD OR OF A TYPE AND SIZE APPROVED BY THE ENGINEER.
2. STEPS SHALL BE SPACED APPROXIMATELY 12" TO 16" O.C. VERTICALLY SO AS TO FORM A CONTINUOUS LADDER.
3. STEPS SHALL BE REQUIRED IN MANHOLES WHEN THE STRUCTURE IS 4 FEET AND GREATER IN DEPTH. (MEASURE FROM FLOWLINE OF LOWEST PIPE TO TOP OF STRUCTURE.)
4. THE TREADS OF ALL STEPS SHALL HAVE ANTI–SKID PROPERTIES FOR HAND AND FOOT GRIPS.
5. MANHOLE STEPS SHALL BE INSTALLED IN A VERTICAL LINE AND SHALL COMPLY WITH OSHA STANDARDS IN ALL RESPECTS.
6. FOR CAST–IN–PLACE OR PRECAST CIRCULAR AND NON–CIRCULAR MANHOLES.
7. FIRST STEP SHALL BE NO MORE THAN 18" FROM TOP OF RIM.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

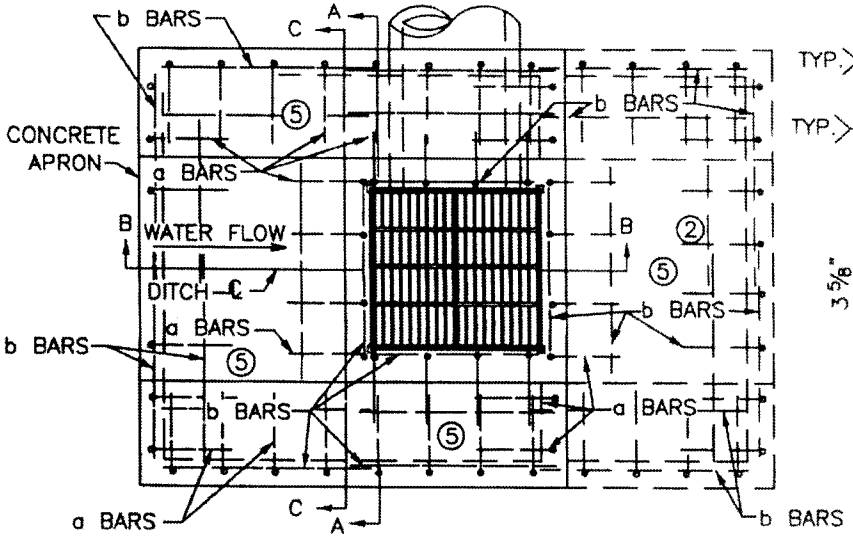
MANHOLE FRAMES, COVERS, & STEPS

STANDARD DRAWING NO. 103

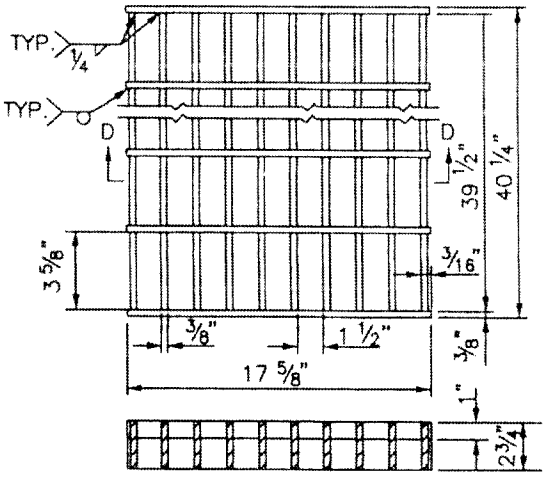
APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/02

COMMISSIONER — DATE

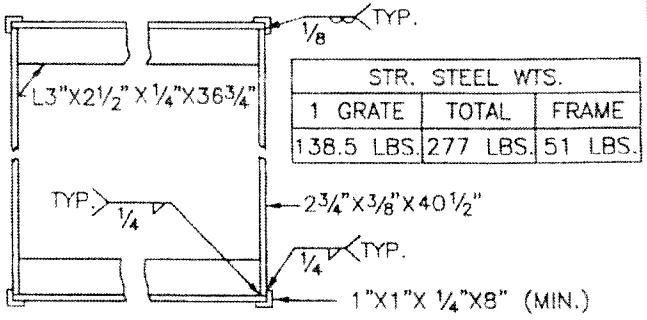


PLAN



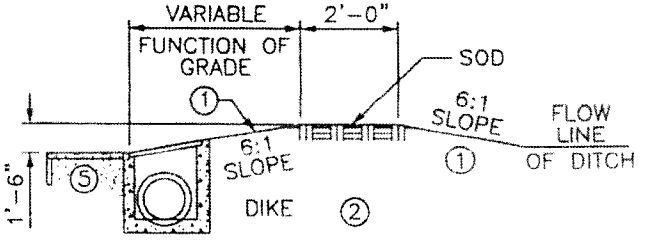
SECTION D–D

DETAIL OF GRATE
(TWO REQUIRED)

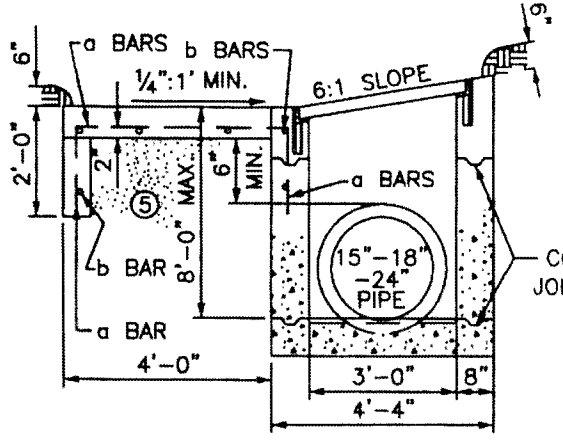


STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS.	277 LBS.	51 LBS.

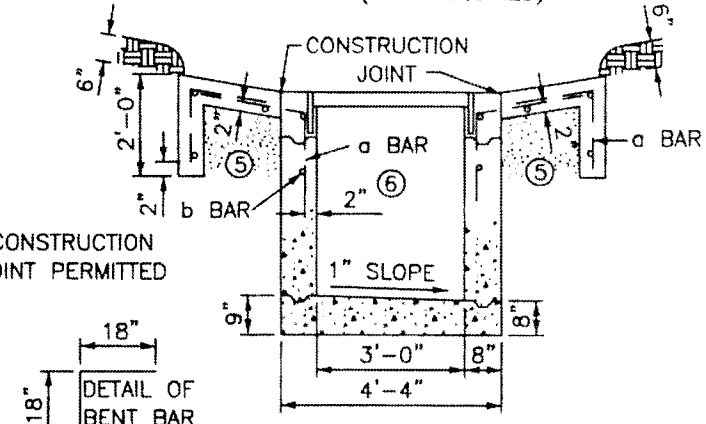
DETAIL OF FRAME



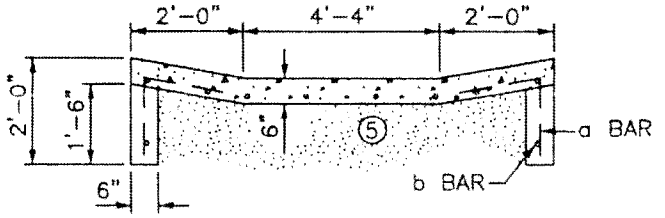
SECTION OF DIKE



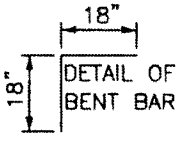
SECTION B–B



SECTION A–A



SECTION C–C



1. 6 : 1 Slopes are with reference to ditch grade.
2. When a box inlet is placed in a sag, omit the earth dike and longitudinal slope of the grate, and provide a concrete apron on each side of the inlet.
3. Rate of increase or decrease 0.36 cu. yd. per foot in height.
4. Deduct approximately 0.1 cu. yd. of concrete per pipe.
5. [Compact] Compact this volume with D.G.A. base or equivalent.
6. Steps are required for depths greater than 4' refer to Std. Dwg. 103.

APPROX. QUANTITIES

TYPE	CONCRETE 3'–9" ③ BOX	REINF. STEEL
SAG	4.4 CU. YD. ④	282 LBS.
GRADE	3.4 CU. YD. ④	192 LBS.

BILL OF REINFORCEMENT

BAR	NO.	SIZE	LENGTH	APPROX. SPACING
a	40 OR 56	#5	3'–0"	12" C TO C
b	25 OR 40	#4	4'–0"	AS SHOWN

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

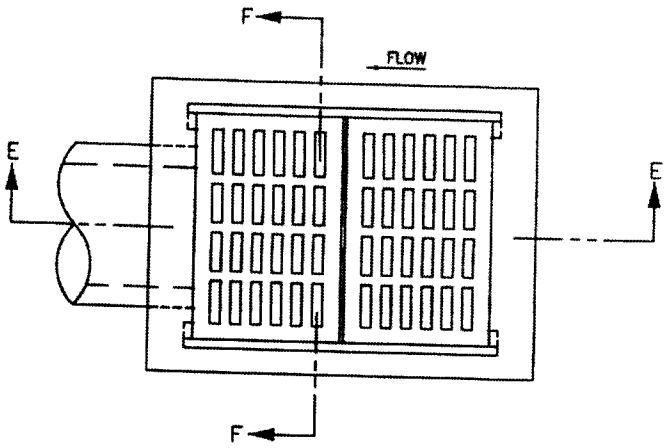
SURFACE INLET TYPE "A"

STANDARD DRAWING NO. 120

APPROVED — URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

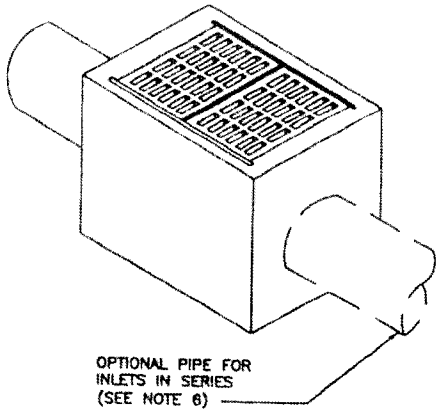


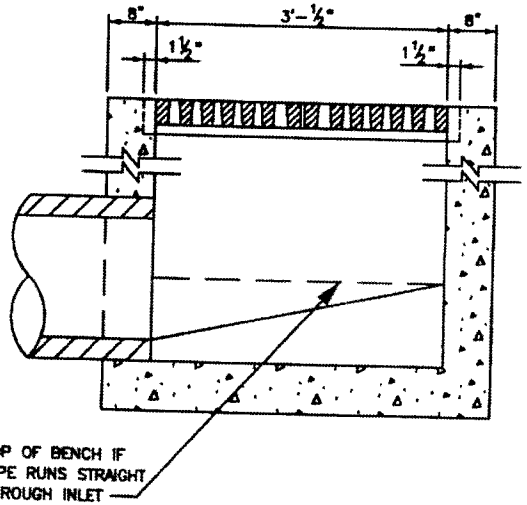
PLAN VIEW

NOTES:

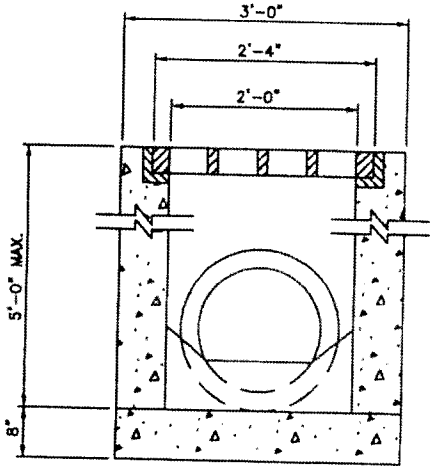
1. NO. 5 STEEL SHALL BE USED THROUGHOUT ON 12" CENTERS.
2. ALL STEEL SHALL HAVE A 2" MINIMUM CLEARANCE TO ANY CONCRETE FACE.
3. NO STEEL IS REQUIRED IN THE BOTTOM SLAB.
4. ALL VERTICAL STEEL SHALL EXTEND 4" INTO BOTTOM SLAB.
5. FOR USE IN PAVED AREAS ONLY.
6. PROVIDE MINIMUM 0.1' SLOPE THROUGH STRUCTURE FOR PIPES IN SERIES. CARRY TROUGH THROUGH. ONLY STRAIGHT THROUGH CONNECTIONS ARE ALLOWED.

ISOMETRIC VIEW

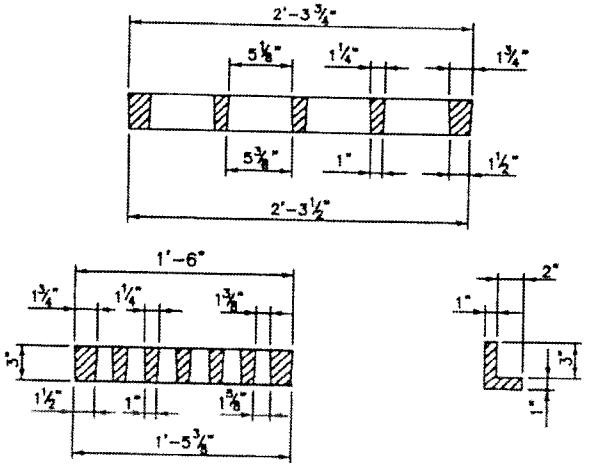




SECTION E–E



SECTION F–F



GRATE DETAILS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

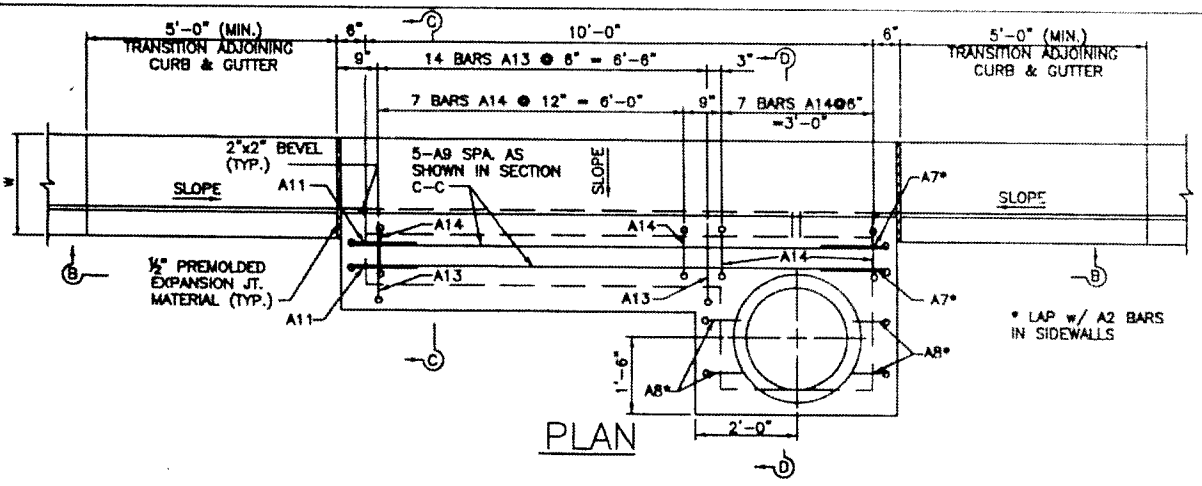
SURFACE INLET TYPE "B"

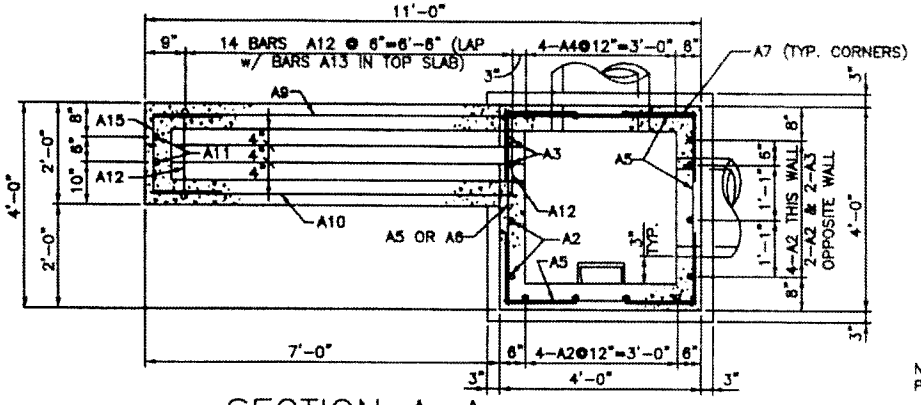
STANDARD DRAWING NO. 121

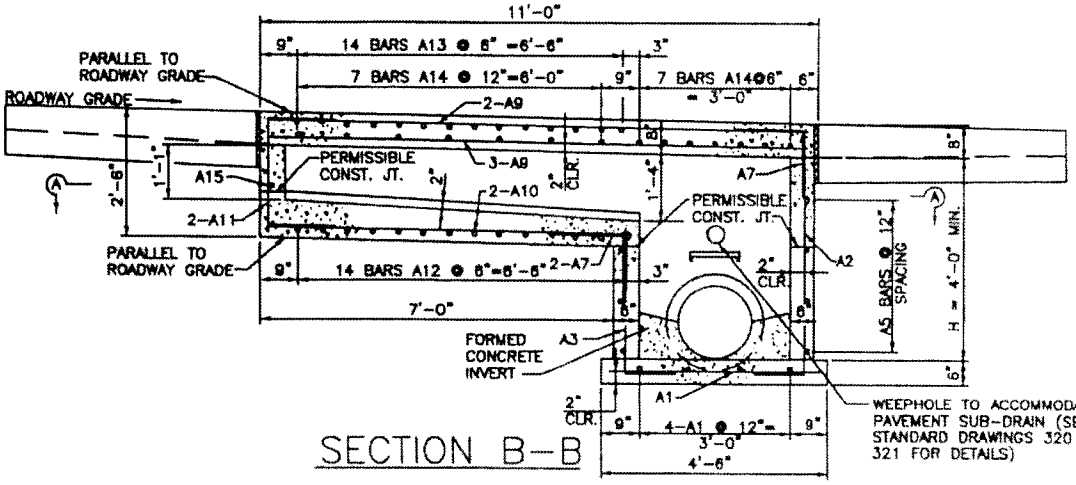
APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

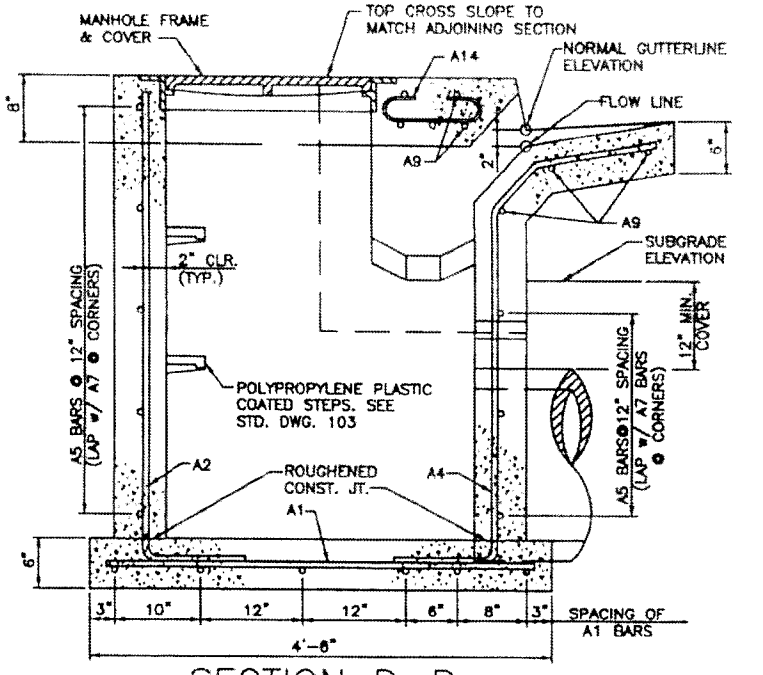
COMMISSIONER — DATE

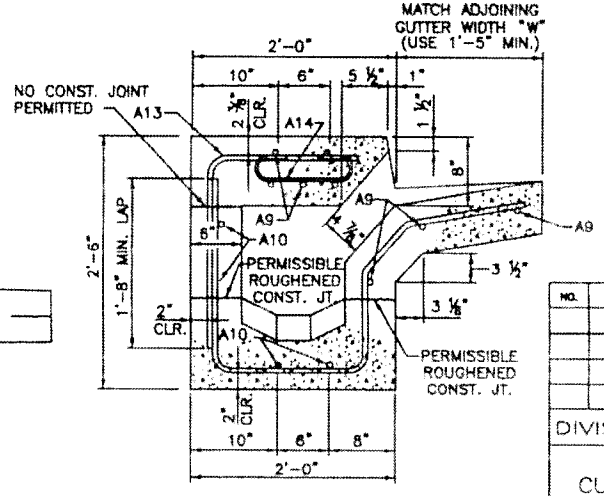
LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT











SEE STD. DWG. 122-2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "A"
4'X4' BOX
15"-18" PIPES

STANDARD DRAWING NO. 122-1

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE

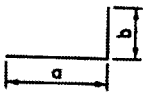
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

BILL OF REINFORCEMENT

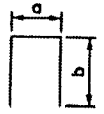
MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
A1	STR	#5	10	4	2	FOOTING								
A2	1	#5	10	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
A3	1	#5	2	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
A4	3	#5	4	H+(2'-4")		CHAMBER FRONT WALL								
A5	STR	#5	15*	3	8	CHAMBER WALLS								
A6	STR	#5	2	2	2	CHAMBER ABOVE THROAT								
A7	1	#5	19*	2	8	CORNERS	1	4	1	4				
A8	1	#5	4	2	1	CHAMBER WALLS & TOP	1	4	0	9				
A9	STR	#5	8	10	8	TOP SLAB & APRON								
A10	STR	#5	4	7	2	THROAT								
A11	2	#5	2	4	8	THROAT	2	1 3/8	1	4				
A12	4	#5	14	6	1	THROAT & APRON								
A13	1	#5	14	3	5	THROAT	1	11	1	6				
A14	5	#3	14	1	11	TOP SLAB	0	11 1/2	0	7	0	3	0	8 1/2
A15	2	#5	1	4	2	END THROAT	1	6	1	4				

* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-A5 & 4-A7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES



TYPE 1



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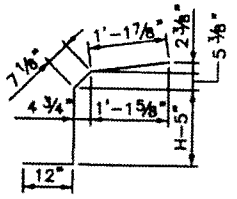

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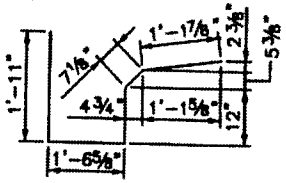

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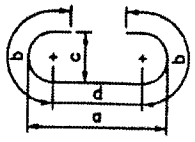
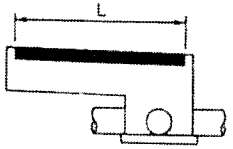
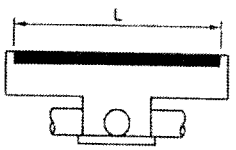


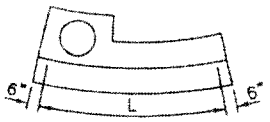
TYPE 5



GRADE



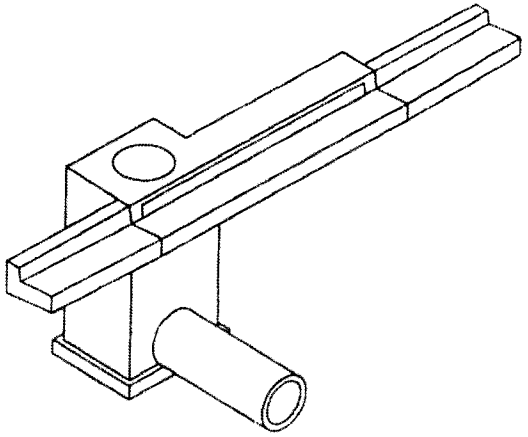
SAG



CURVE LENGTH

DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED ¾" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS A9 & A10 AND INCREASE OR DECREASE IN NUMBER OF BARS A12, A13 & A14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS A2, A4, AND A5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS A9, A10 SHALL BE SHOP FABRICATED RADIALLY.

WORK THIS DWG. WITH STD. DWG. 122-1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

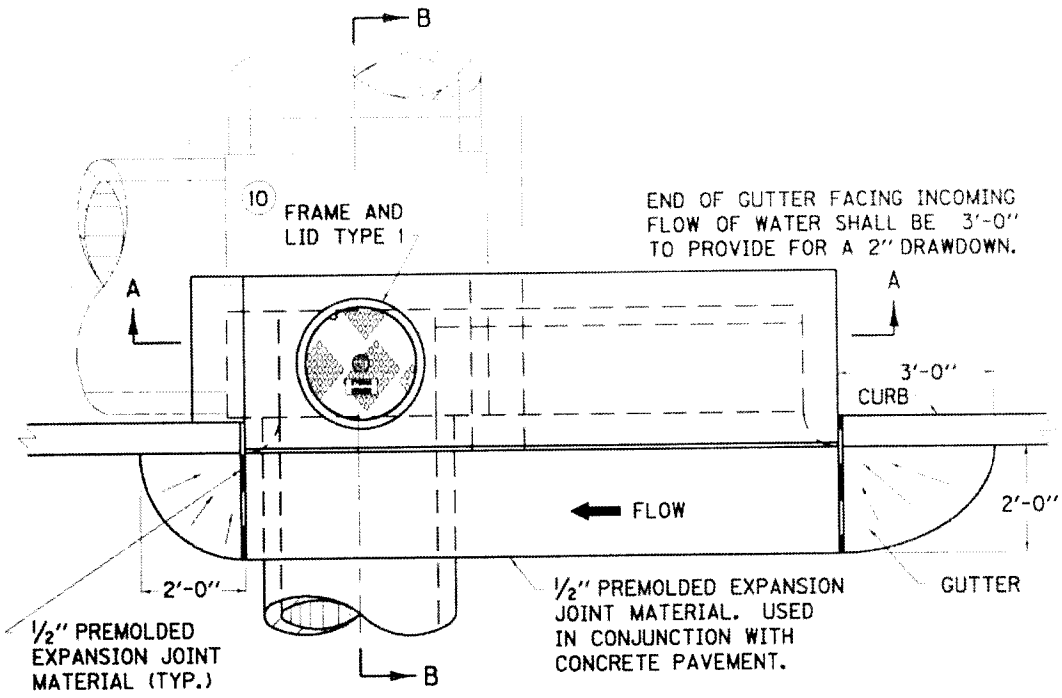
CURB BOX INLET TYPE "A"
4'X4' BOX
15'-18" PIPES

STANDARD DRAWING NO. 122-2

APPROVED: 5/1/02
URBAN COUNTY ENGINEER — DATE

COMMISSIONER — DATE

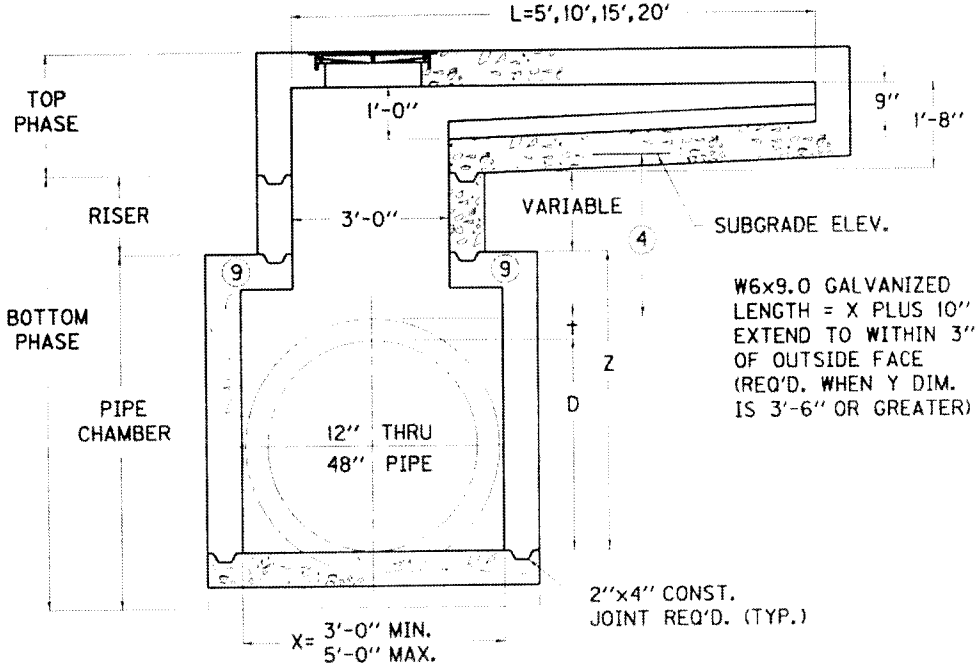
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



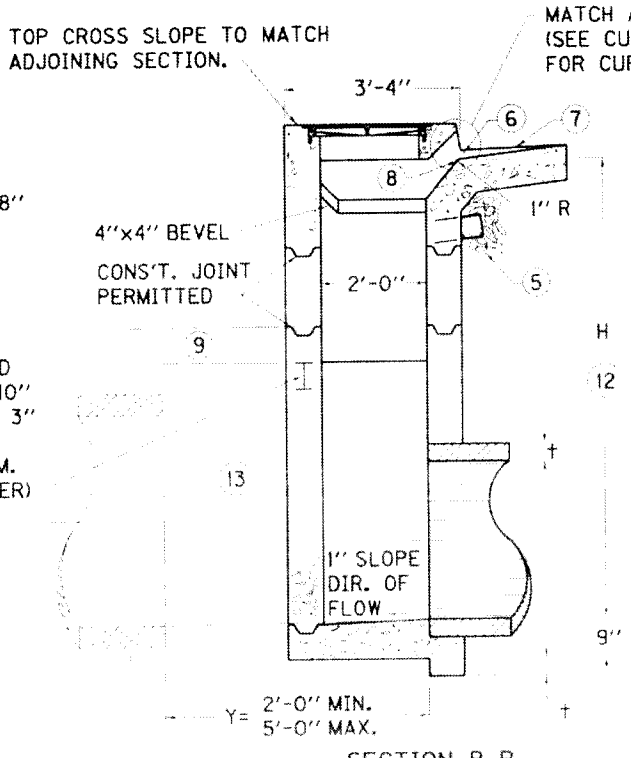
PLAN VIEW

~ NOTES ~

1. INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) BID ITEM: CURB BOX INLET TYPE A (Δ)
   Δ (B) = BOTTOM PHASE ONLY, Δ (T) = TOP PHASE ONLY
   NO SUFFIX INDICATES COMPLETE INLET.
2. SEE CUR. STD. DWG. RDB-271, RDB-272, RDB-273, RDB-400, RDB-410 AND RDB-420 FOR STEEL PATTERN, DIMENSIONS AND QUANTITIES.
3. ALL WALLS, SLABS AND GUTTERS ARE 8" THICK UNLESS OTHERWISE INDICATED.
4. 2'-0" DESIRED COVER, 1'-0" MINIMUM COVER.
5. SPALLS OR CRUSHED STONE AROUND END OF 4" OR 6" PIPE FOR SUBGRADE DRAINAGE.
6. 2" MINIMUM DRAWDOWN.
7. GUTTER CROSS SLOPE.
8. FLOW LINE (2" BELOW NORMAL GUTTERLINE ELEVATION).
9. LID MAY BE RAISED OR LOWERED IF APPROVED BY THE ENGINEER.
10. SEE CUR. STD. DWG. RDM-100 FOR FRAME AND LID TYPE 1.
11. NOTE: "†" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
12. MINIMUM HEIGHTS
    H = Z + 1'-8" FOR STANDARD CURB
    H = Z + 1'-10" FOR ISLAND CURB
    H = Z + 1'-5" FOR BARRIER CURB
13. CHAMBER MAY BE SHIFTED TO ROADWAY SIDE OF BOX PROVIDED THERE IS 1'-0" MINIMUM COVER BETWEEN SUBGRADE ELEVATION AND TOP OF PIPE.



SECTION A-A



SECTION B-B

RISER
CU. YD. CONC. PER FT. HT.
0.3

USE WITH CUR. STD. DRAWINGS, RDB-271, RDB-272, RDB-273, RDB-400, RDB-410, RDB-420 AND RDM-100.

KENTUCKY DEPARTMENT OF HIGHWAYS

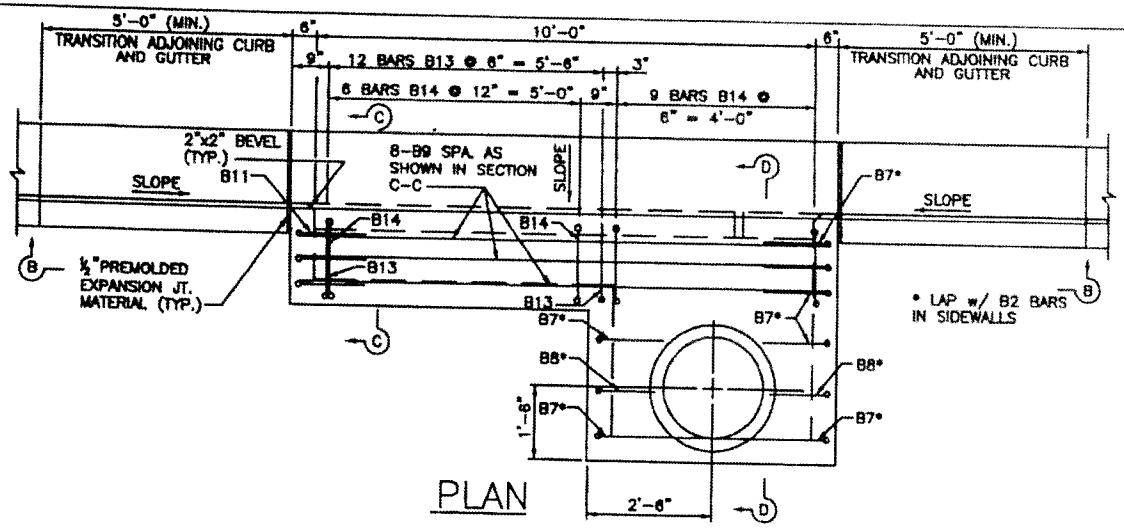
CURB BOX INLET TYPE A

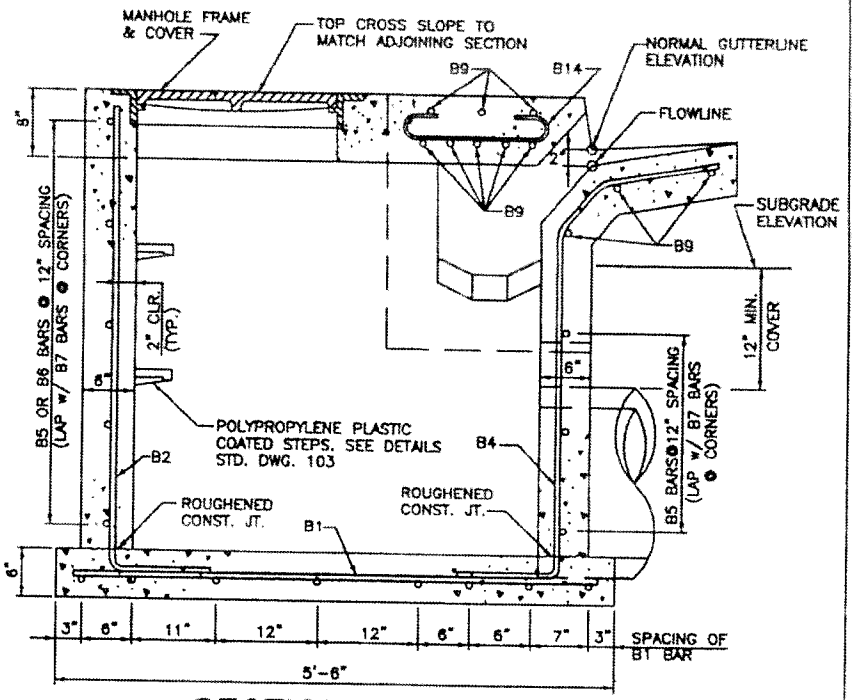
(DETAIL DRAWING)

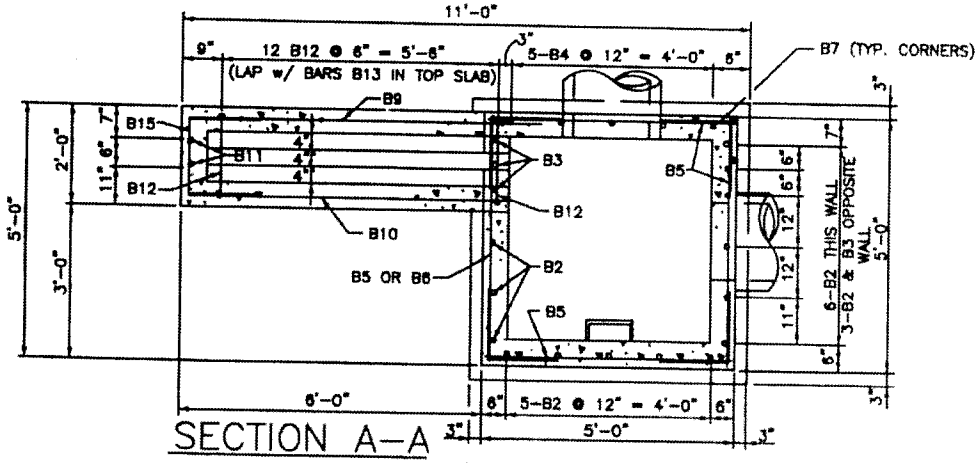
STANDARD DRAWING NO. RDB-270-08

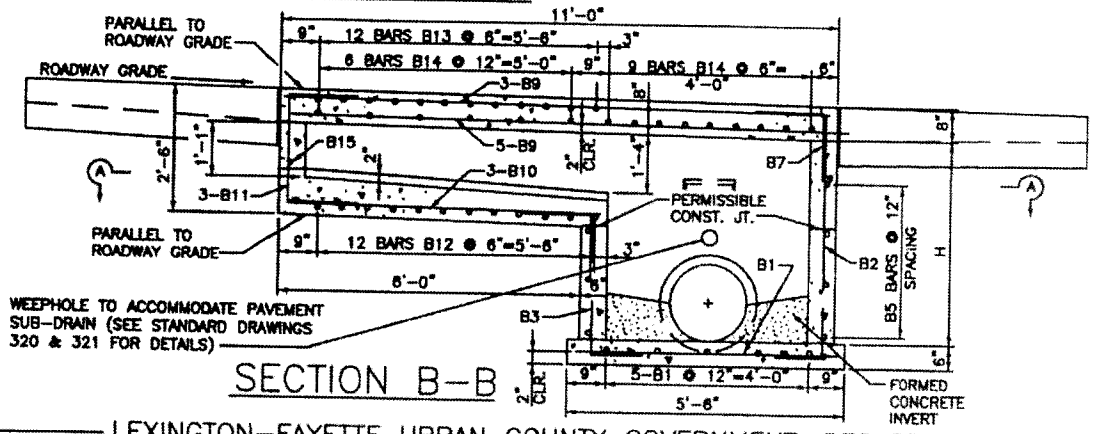
11-21-07

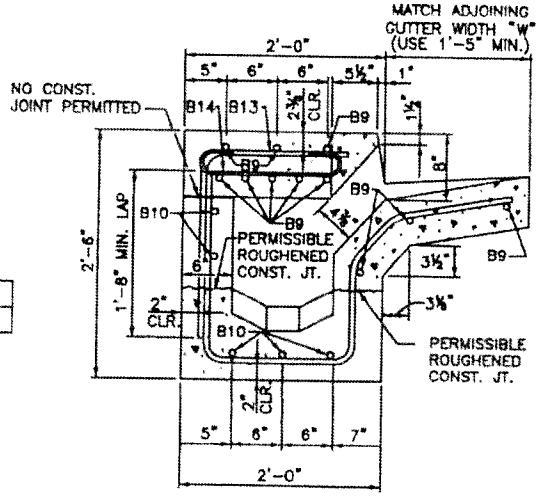
11-21-07











SEE STD. DWG. 123-2 FOR BILL OF REINFORCEMENT & ADDITIONAL DETAILS.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

CURB BOX INLET TYPE "B" 5'X5' BOX 15"-24" PIPES

STANDARD DRAWING NO. 123-1

APPROVED: URBAN DRAINAGE ENGINEER — DATE 5/1/01

COMMISSIONER — DATE 5/1/01

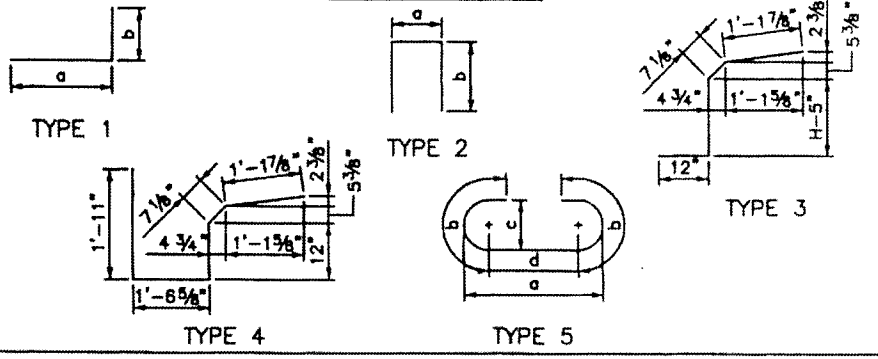
LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

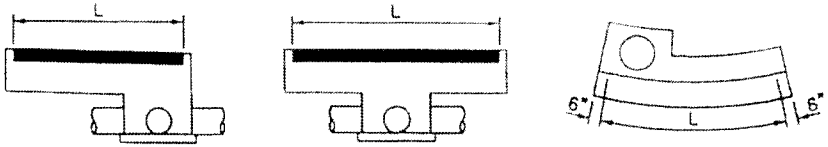
BILL OF REINFORCEMENT

MARK	TYPE	SIZE	NO.	LENGTH FT.	LENGTH IN.	LOCATION	a FT.	a IN.	b FT.	b IN.	c FT.	c IN.	d FT.	d IN.
B1	STR	#5	13	5	2	FOOTING								
B2	1	#5	14	H+(1'-10")		CHAMBER WALLS	1	0	H+10"					
B3	1	#5	3	H-4"		CHAMBER WALLS	1	0	H-(1'-4")					
B4	3	#5	5	H+(2'-4")		CHAMBER FRONT WALL								
B5	STR	#5	15*	4	8	CHAMBER WALLS								
B6	STR	#5	2	3	2	CHAMBER ABOVE THROAT								
B7	1	#5	25*	2	8	CORNERS	1	4	1	4				
B8	1	#5	2	2	6	CHAMBER WALLS & TOP	1	4	1	2				
B9	STR	#5	11	10	8	TOP SLAB & APRON								
B10	STR	#5	5	6	2	THROAT								
B11	2	#5	3	4	8	THROAT	2	1 5/8	1	4				
B12	4	#5	12	6	1	THROAT & APRON								
B13	1	#5	12	3	5	THROAT	1	11	1	6				
B14	5	#5	15	2	4	TOP SLAB	1	5	0	7	0	3	1	2
B15	2	#5	1	4	1	END THROAT	1	6	1	4				

* NO. OF BARS REQUIRED FOR H=4'-0"
ADD OR DEDUCT 4-B5 & 4-B7 FOR EACH 1'-0" INCREASE OR DECREASE IN H.

BAR TYPES

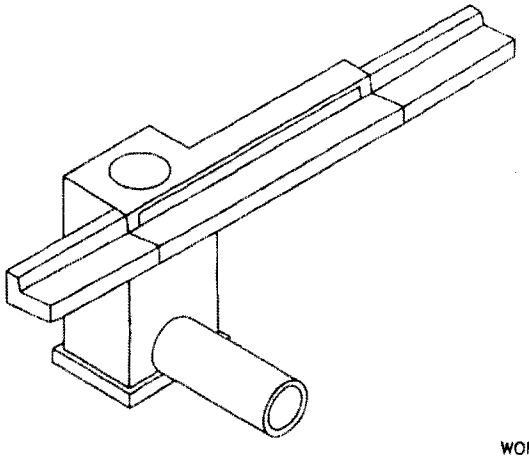




GRADE SAG CURVE LENGTH

DETAIL 'A'

APPLICABLE SITUATIONS



ISOMETRIC VIEW

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. STEEL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60. ALL EXPOSED EDGES SHALL BE BEVELED 3/4" UNLESS OTHERWISE SHOWN.
2. THIS DRAWING DEPICTS A CURB BOX INLET IN A GRADE SITUATION. FOR CURB BOX BOX IN SAG SITUATION, DETAILS SHALL BE MODIFIED AS INDICATED IN DETAIL 'A'.
3. THE STANDARD OPENING LENGTH IS 10'-0" AS DETAILED HERE. THIS LENGTH MAY BE INCREASED OR DECREASED BASED ON HYDRAULIC ANALYSIS AND APPROVAL BY THE LEXINGTON-FAYETTE COUNTY URBAN GOVERNMENT ENGINEER. MODIFICATION TO THE OPENING LENGTH WILL REQUIRE MODIFICATION OF LENGTH OF BARS B9 & B10 AND INCREASE OR DECREASE IN NUMBER OF BARS B12, B13 & B14 MAINTAINING THE SAME MAXIMUM SPACING SHOWN ON THIS DRAWING.
4. MAXIMUM "H" FOR APPLICATION OF THIS DRAWING SHALL BE 10 FEET.
5. FIELD BEND OR CUT BARS B2, B4, AND B5 AS NECESSARY WHERE PIPES PENETRATE CHAMBER WALLS.
6. FOR CURB BOX INLET IN CURVE WITH CURB RADIUS OF LESS THAN 25', LONGITUDINAL BARS B9, B10 SHALL BE SHOP FABRICATED RADIALLY.
7. 30" PIPE MAY BE APPROVED IF BOTH PIPES ARE INSTALLED ON THE SAME LINE.

WORK THIS DWG. WITH STD. DWG. 123-1

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

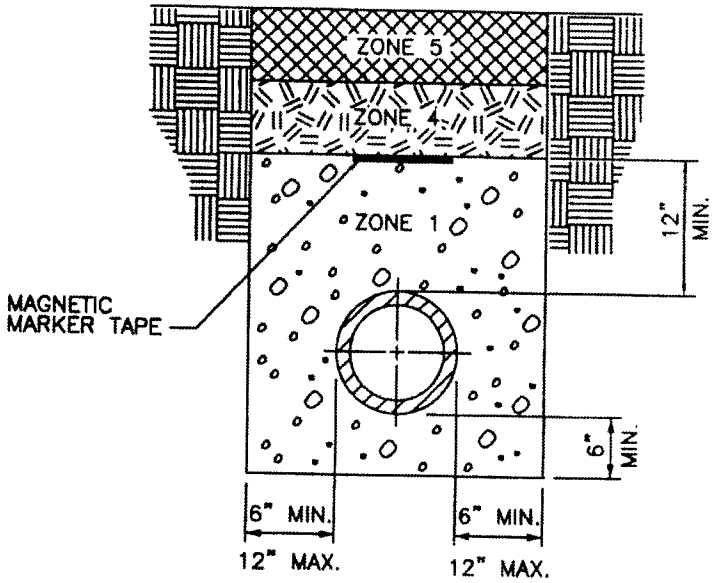
CURB BOX INLET TYPE "B"
5'X5' BOX
15"-24" PIPES

STANDARD DRAWING NO. 123-2

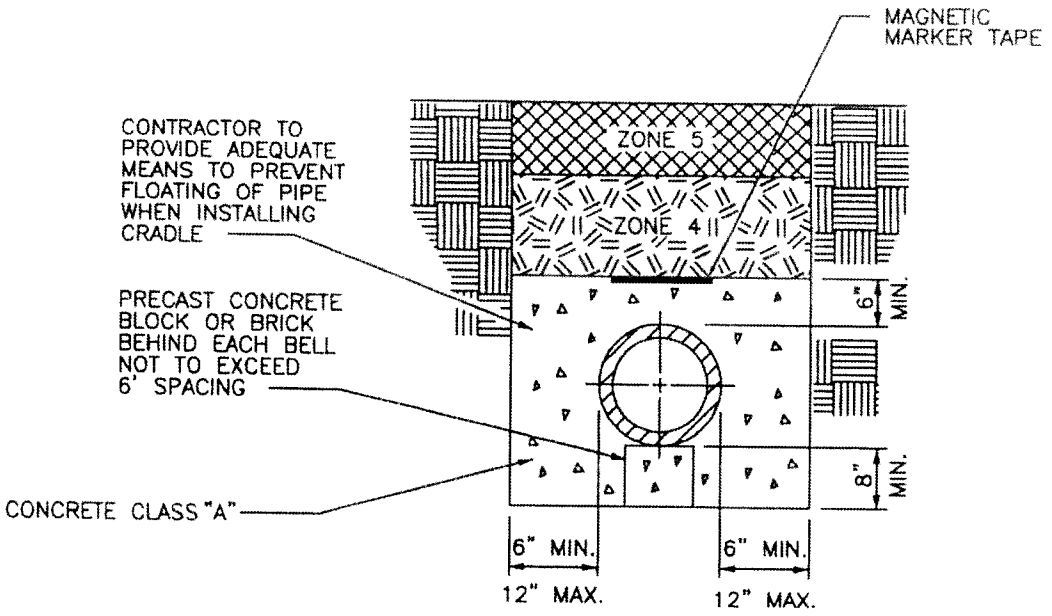
APPROVED _____ DATE 5/1/08
URBAN DRAINAGE ENGINEER

_____ DATE 5/1/08
COMMISSIONER

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



PIPE LAID IN ROCK OR SOIL TRENCH



STANDARD CONCRETE ENCASEMENT (NOTE: AS REQUIRED BY DESIGN)

PIPE BACKFILL DESCRIPTIONS	
ZONE 1	NO. 9 STONE
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL (NO ROCK GREATER THAN 6" DIAMETER), NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. COVER, UP TO AND INCLUDING ZONE 4 SHALL BE ESTABLISHED BEFORE TRENCH EXCAVATION.
2. ALL SANITARY SEWER LINES CONSTRUCTED FROM NON-METALLIC MATERIALS SHALL HAVE MAGNETIC MARKER TAPE INSTALLED IN THE TRENCH ABOVE THE SANITARY SEWER LINE.
3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.

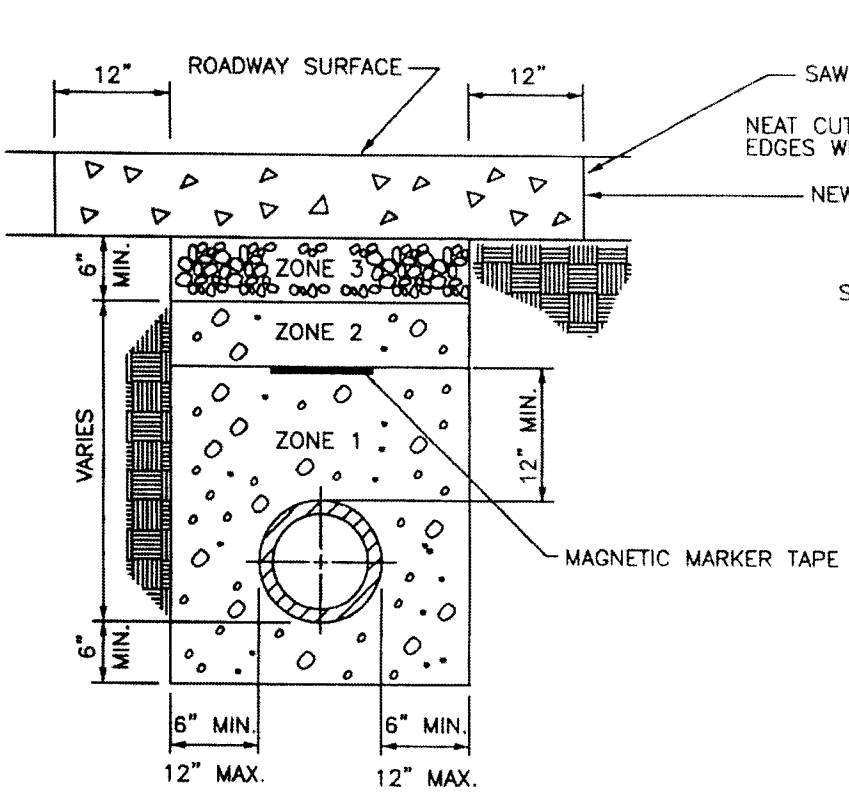
NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

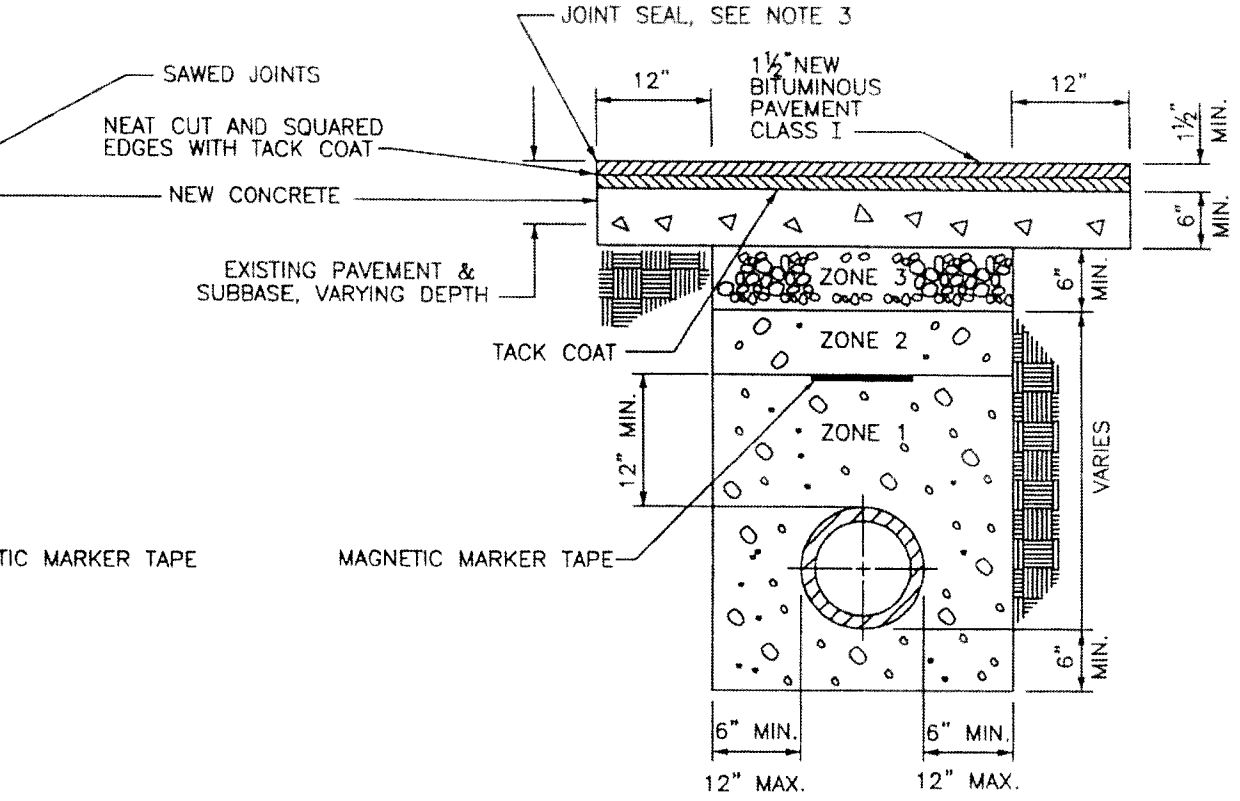
TRENCHING, LAYING, BACKFILLING AND BEDDING OUTSIDE R/W LIMITS

STANDARD DRAWING NO. 200

APPROVED: [signature] 5/1/08
DATE
FAYETTE COUNTY ENGINEER
[signature] 5/1/08
COMMISSIONER DATE



CONCRETE PAVEMENT



BITUMINOUS PAVEMENT

PIPE BACKFILL DESCRIPTIONS	
ZONE 1	NO. 9 STONE
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL, (NO ROCK GREATER THAN 6" DIAMETER), NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6"MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
2. JOINT SEAL PERIMETER OF CUT PAVEMENT WITH FLEXMASTER POURABLE CRACK SEALANT 1109 OR APPROVED EQUAL.
3. MAGNETIC MARKER TAPE FOR SANITARY SEWER ONLY.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

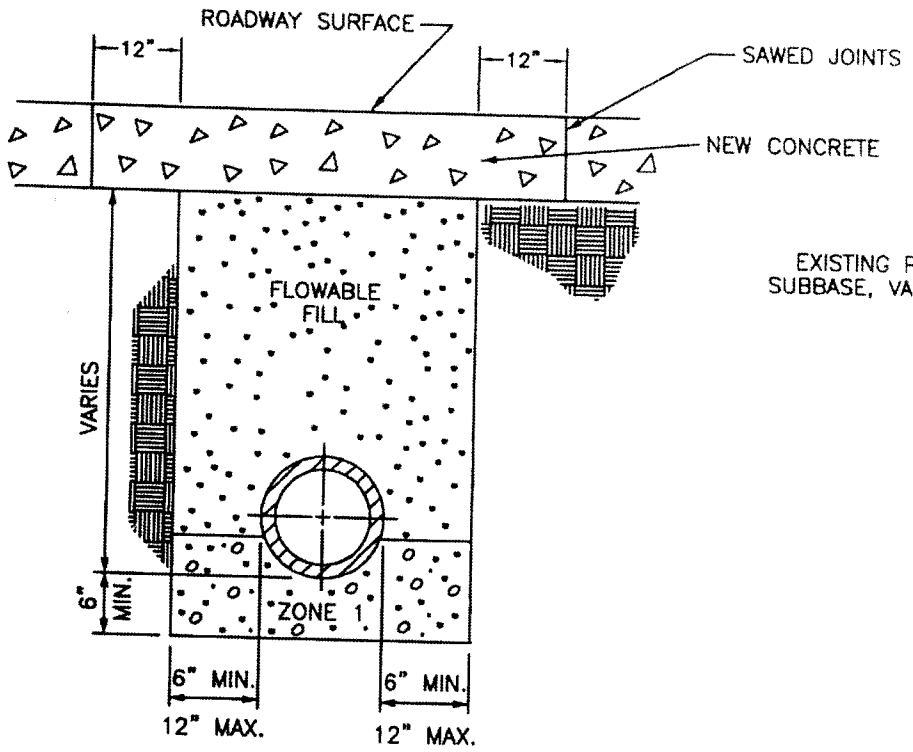
TRENCHING, LAYING, BACKFILLING AND BEDDING UNDER STREET PAVEMENT

STANDARD DRAWING NO. 201-1

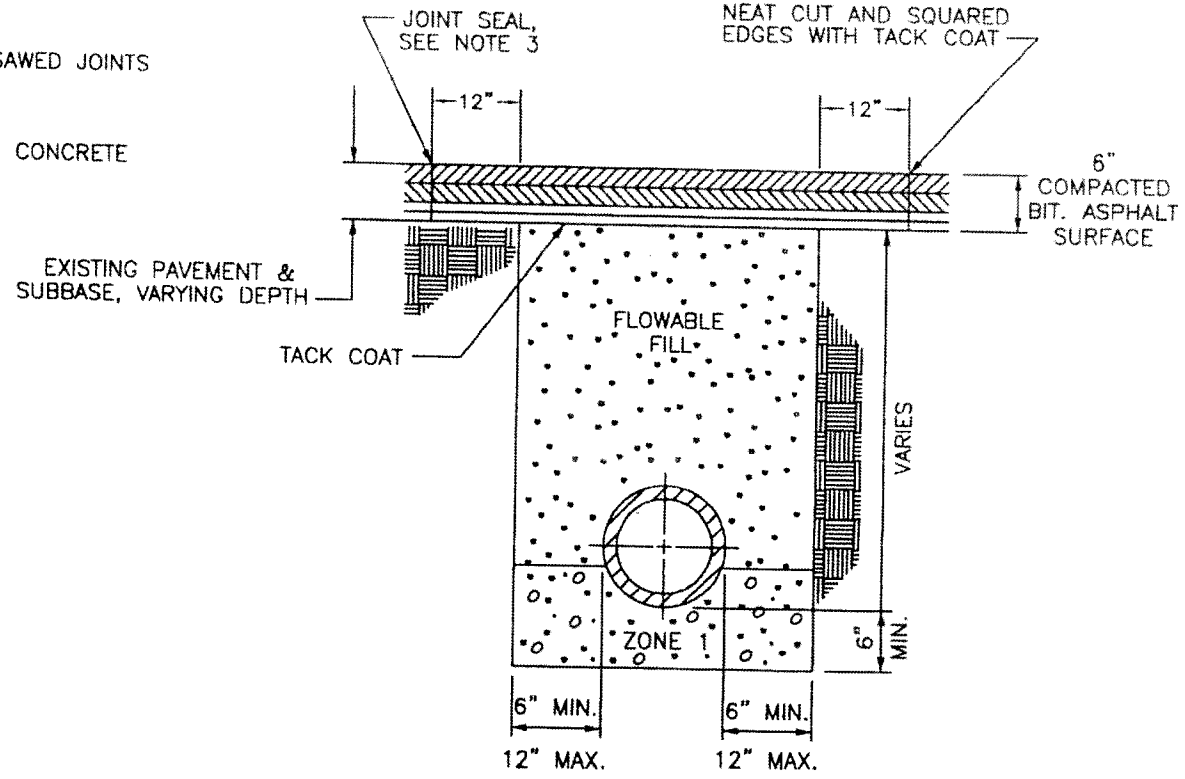
APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



CONCRETE PAVEMENT



BITUMINOUS PAVEMENT

PIPE BACKFILL DESCRIPTIONS	
ZONE 1	**NO. 9 STONE**
ZONE 2	NO. 9 OR NO. 57 STONE
ZONE 3	COMPACTED DGA
ZONE 4	CONSOLIDATED SOIL, (NO ROCK GREATER THAN 6" DIAMETER), NO. 9, OR NO. 57 STONE
ZONE 5	12" MAX. TOPSOIL, NO ROCK ALLOWED

NOTES:

1. PER KYTC SPECIFICATION 601.03.03 FROM STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION EDITION 2004, OR MOST RECENT.
2. REPLACE CONCRETE PAVEMENT WITH NEW CONCRETE PAVEMENT, 6" MINIMUM OR EXISTING THICKNESS, WHICHEVER IS GREATER.
3. JOINT SEAL PERIMETER OF CUT PAVEMENT WITH FLEXMASTER POURABLE CRACK SEALANT 1109 OR APPROVED EQUAL.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

TRENCHING, LAYING, BACKFILLING, AND BEDDING UNDER STREET PAVEMENT USING FLOWABLE FILL

STANDARD DRAWING NO. 201-2

APPROVAL _____ DATE 5/1/08

URBAN COUNTY ENGINEER

COMMISSIONER _____ DATE

TABLE OF:

MAXIMUM ALLOWABLE FILL HEIGHTS

(LIVE LOAD NOT INCLUDED)

DIAMETER (INCHES)	DUCTILE IRON PIPE	POLYVINYL CHLORIDE (PVC) PIPE	
	CLASS 50 *	SDR-35	SDR-26 HEAVY WALL
	MAXIMUM DEPTH OF COVER (FEET)	MAXIMUM DEPTH OF COVER (FEET)	MAXIMUM DEPTH OF COVER (FEET)
4	–	–	–
6	20	15	–
8	20	15	–
10	20	15	–
12	20	15	–
14	20	–	–
15	–	15	–
16	20	–	–
18	20	–	20
20	18	–	–
21	–	–	20
24	17	–	20
27	–	–	20
30	14	–	–
36	14	–	–
42	13	–	–
48	13	–	–

* LIGHTEST CLASS OF DUCTILE IRON PIPE

NOTES:

1. DEPTH IS BASED ON LAYING CONDITION UTILIZING NO. 9 STONE ENCASING PIPE FROM 6" MINIMUM BELOW PIPE TO A PLANE, LEVEL WITH THE TOP OF THE PIPE AND 6" TO 12" NO. 9 STONE TO EDGE OF TRENCH.
2. WEIGHT OF SOIL AND ROCK COVER MIX IS ASSUMED TO BE APPROXIMATELY 120 LB./CU. FT.
3. DUCTILE IRON PIPE HAS FLEXIBLE LINING.
4. DESIGN ENGINEERS SHOULD USE THIS STANDARD DRAWING FOR GENERAL GUIDELINES AND SHOULD CHECK THEIR DESIGN FOR SAFE, NON-DESTRUCTIVE FILL HEIGHTS FOR ACTUAL BRAND OF PIPE PROPOSED.
5. SPECIAL TRENCHING DETAILS AND PROCEDURES SHOULD BE USED WHERE FILL DEPTHS ARE HIGHER THAN THOSE SHOWN IN TABLE.
6. INSTALLATIONS REQUIRING A DEPTH GREATER THAN 20', MUST BE APPROVED BY THE ENGINEER.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

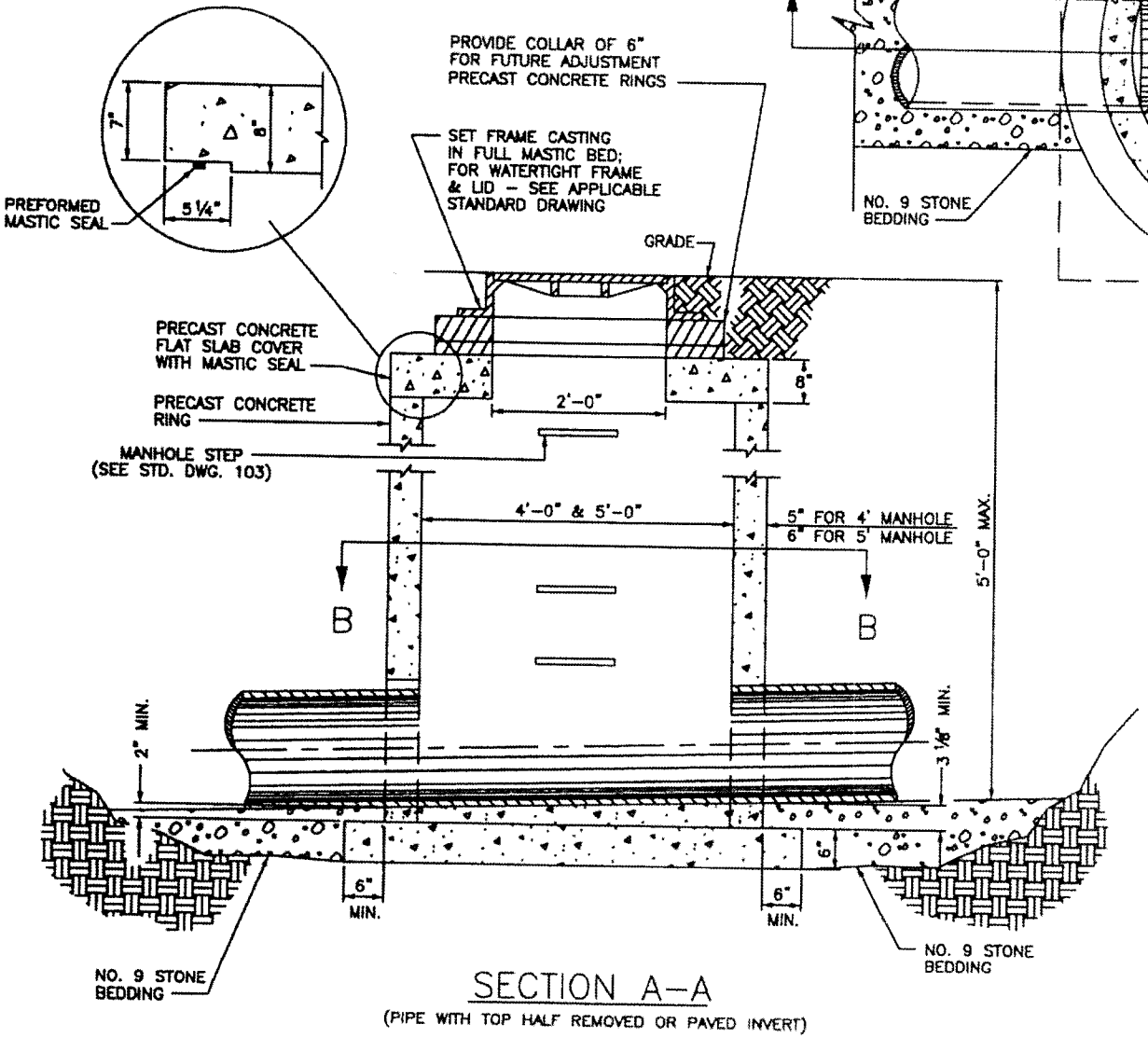
SANITARY SEWER PIPE: TYPES & MAXIMUM ALLOWABLE FILL HEIGHTS

STANDARD DRAWING NO. 204

APPROVAL: [signature] DATE 5/1/08

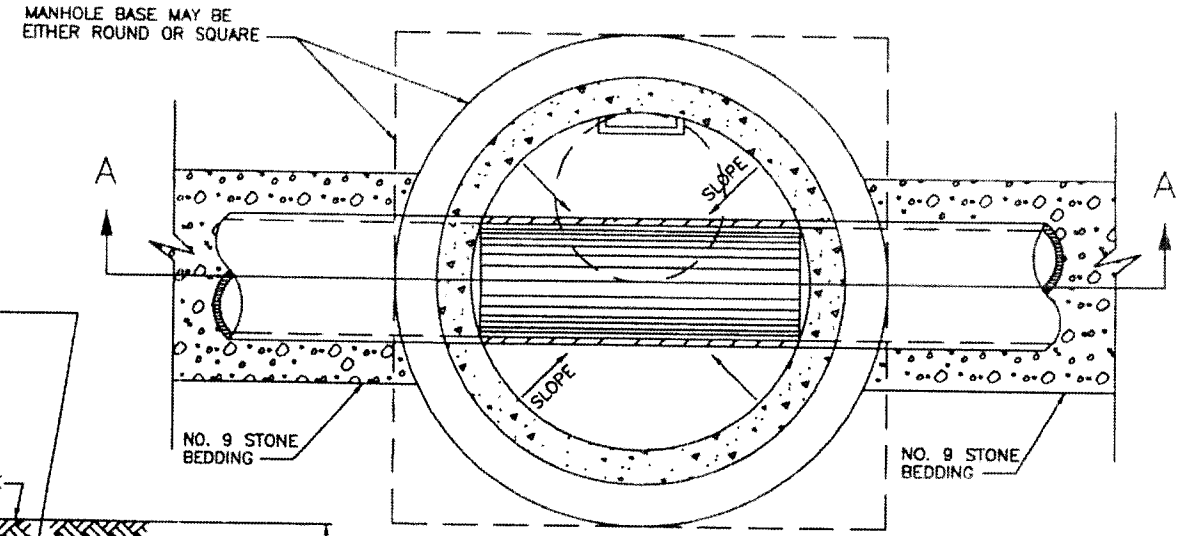
URBAN COUNTY ENGINEER

COMMISSIONER [signature] DATE 5/1/08



SECTION A–A

(PIPE WITH TOP HALF REMOVED OR PAVED INVERT)



SECTION B–B

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI–FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 FOR WATER STOP DETAIL.
4. MANHOLES MUST PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

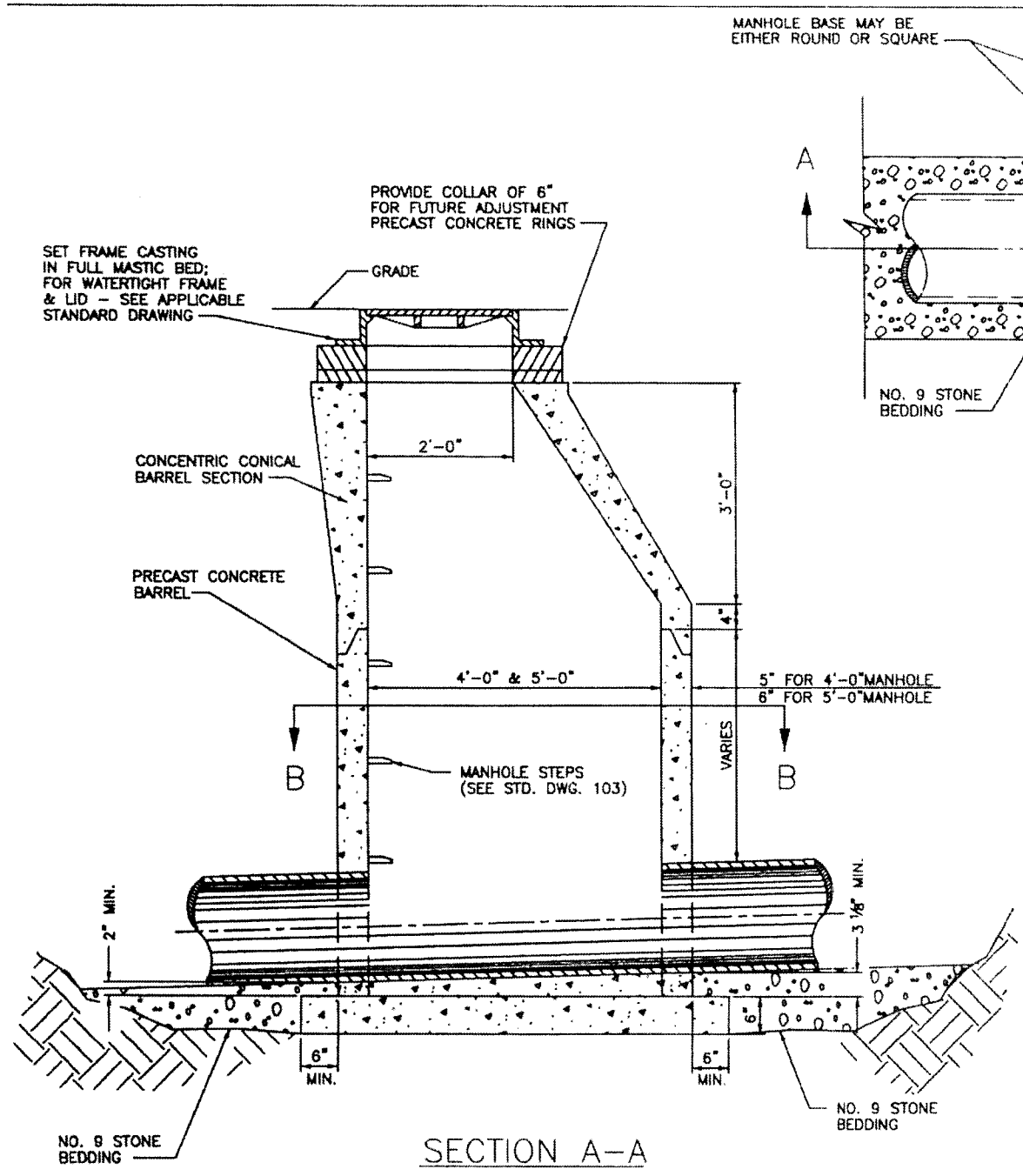
TYPICAL PRECAST CONCRETE SHALLOW MANHOLE FOR PIPES 24" AND LARGER

STANDARD DRAWING NO. 210

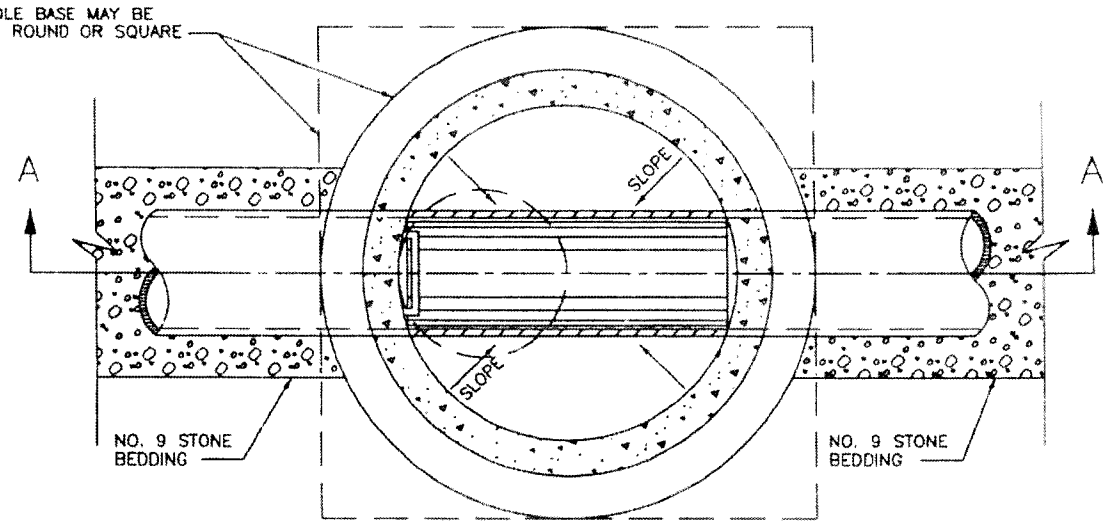
APPROVED: [signature] DATE 5/1/08

URBAN COUNTY ENGINEER / COMMISSIONER [signature] DATE 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



SECTION A–A



SECTION B–B

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI-FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 FOR WATER STOP DETAIL.
4. NO REINFORCEMENT NEEDED IN BOTTOM SLAB AT DEPTHS UP TO 12'. AT DEPTHS GREATER THAN 12' REINFORCE WITH NO. 4 BARS – 12" C–C.
5. A DIFFERENCE OF FLOW ELEVATION MORE THAN 24" REQUIRES AN OUTSIDE DROP. (SEE STD. DWG. 212)
6. MANHOLE STEPS SHALL BE ALIGNED WITH STRAIGHT SIDE OF CONCENTRIC CONE SECTION, AND ALIGNED OVER THE OUTLET PIPE.
7. PIPES SHALL NOT ENTER THE CONE SECTION.
8. MANHOLES MUST PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

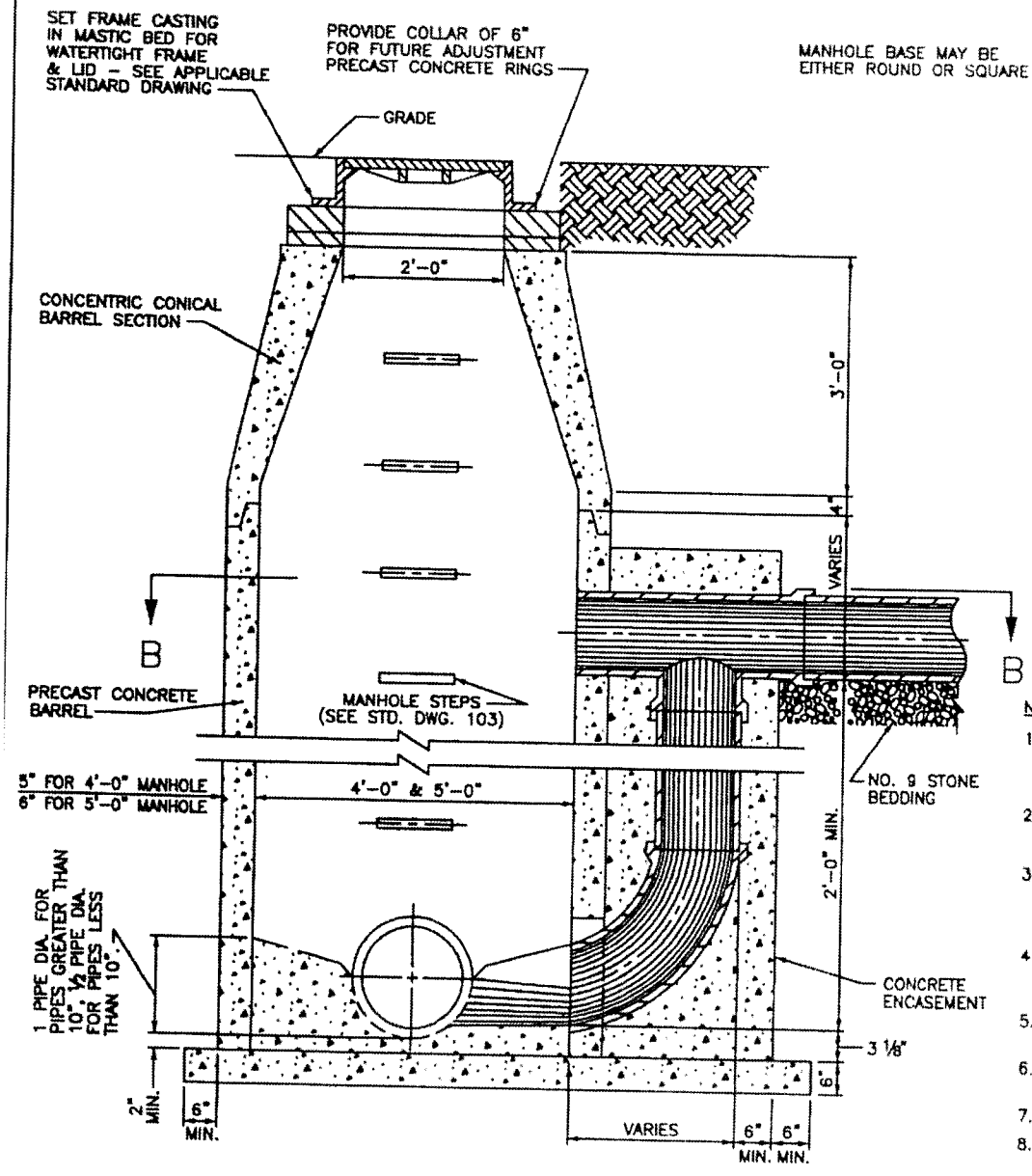
TYPICAL STANDARD PRECAST CONCRETE MANHOLE FOR PIPES UP TO 24"

STANDARD DRAWING NO. 211

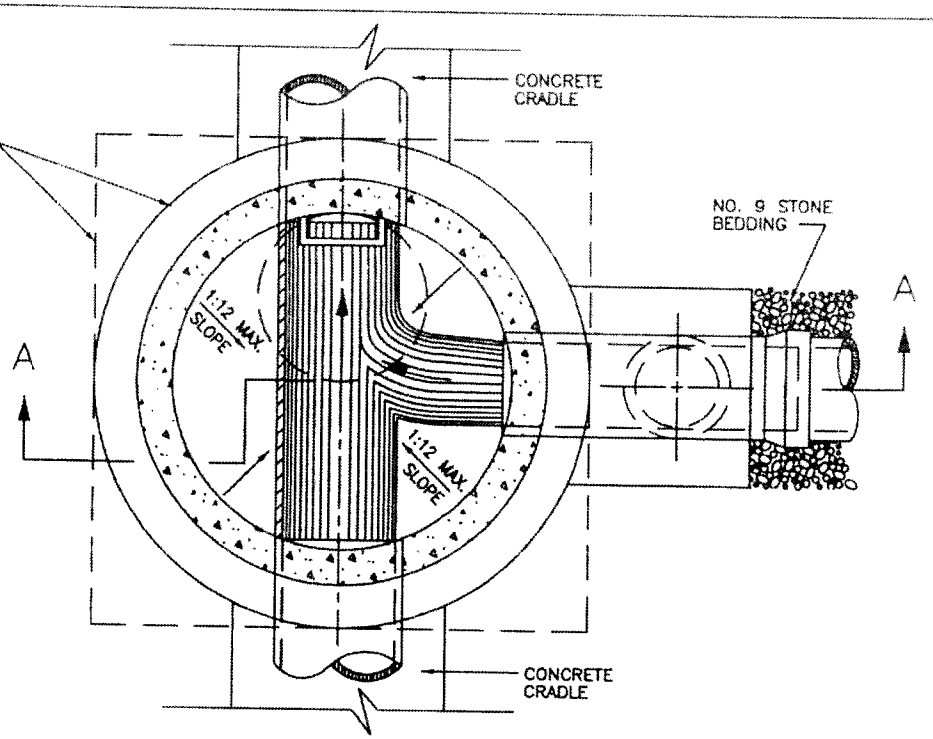
APPROVED: URBAN COUNTY ENGINEER AND COMMISSIONER — DATE 5/1/08

DATE 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



SECTION A–A



SECTION B–B

NOTES:

1. ALL BARREL JOINTS BETWEEN BASE AND BARREL, BETWEEN BARREL AND TOP, BETWEEN TOP AND ADJUSTING RINGS, BETWEEN ADJUSTING RINGS AND FRAME SHALL HAVE ONE OUTER MASTIC SEAL AND AN INNER SEAL OF NONSHRINK GROUT.
2. COAT OUTSIDE OF ADJUSTING RINGS WITH SEMI–FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. WATER STOPS SHOULD BE PROVIDED FOR INLETS AND OUTLETS OF EVERY MANHOLE, DESIGNED FOR TYPE OF PIPE USED AND WITH EXPANSIVE GROUT. SEE STD. DWG. 213 APPLICABLE FOR WATER STOP DETAIL.
4. NO REINFORCEMENT NEEDED IN BOTTOM SLAB AT DEPTHS UP TO 12'. AT DEPTHS GREATER THAN 12' REINFORCE WITH NO. 4 BARS – 12" C–C.
5. PROVIDE A MINIMUM FALL OF 0.1 FOOT FROM DROP TO MANHOLE OUTLET.
6. MANHOLES SHALL PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.
7. PIPE SHALL NOT ENTER CONE SECTION.
8. MANHOLE STEPS SHALL BE ALIGNED WITH STRAIGHT SIDE OF CONCENTRIC CONE SECTION, AND ALIGNED OVER OUT–LET PIPE.
9. DO NOT USE IN CASES WHERE THE DROP IS 2'–0" OR LESS.

NO.	DATE	REVISION DESCRIPTION	BY

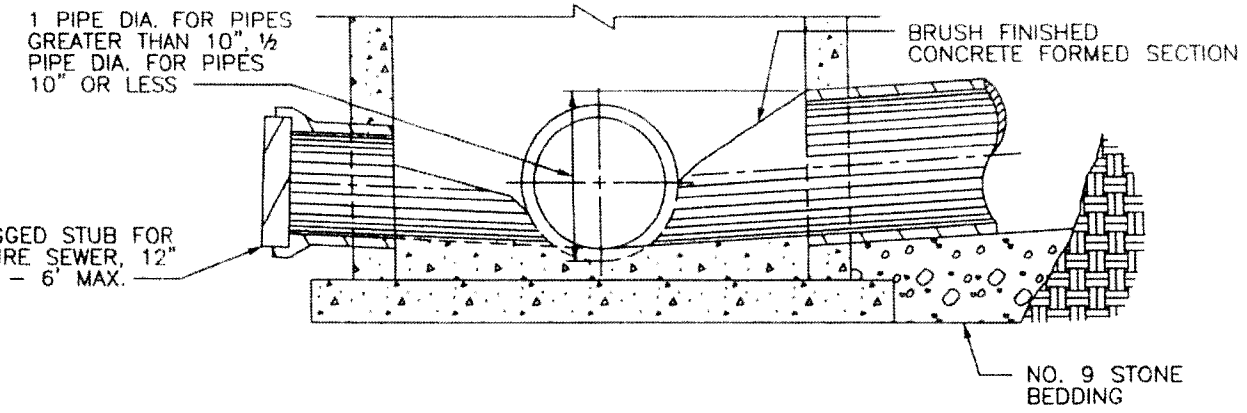
DIVISION OF ENGINEERING

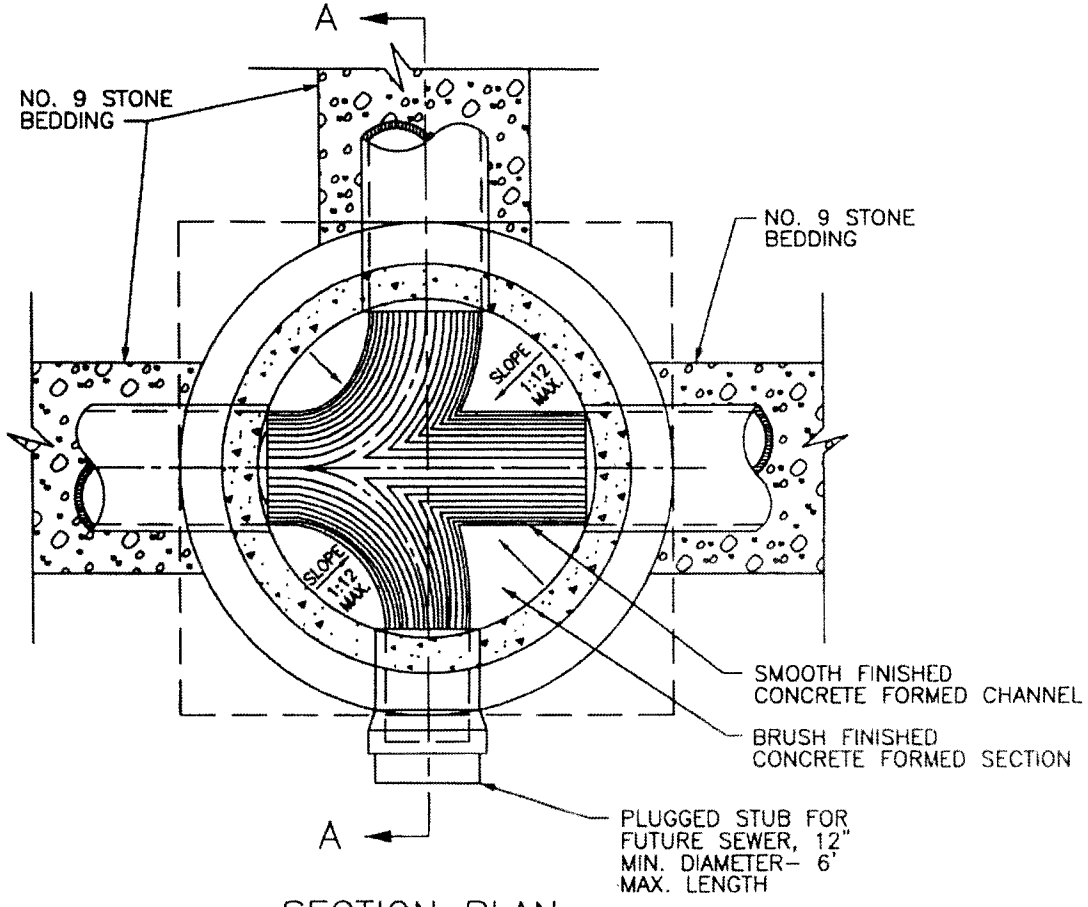
TYPICAL PRECAST CONCRETE DROP MANHOLE FOR PIPES UP TO 36"

STANDARD DRAWING NO. 212

APPROVED [redacted] DATE 5/1/01

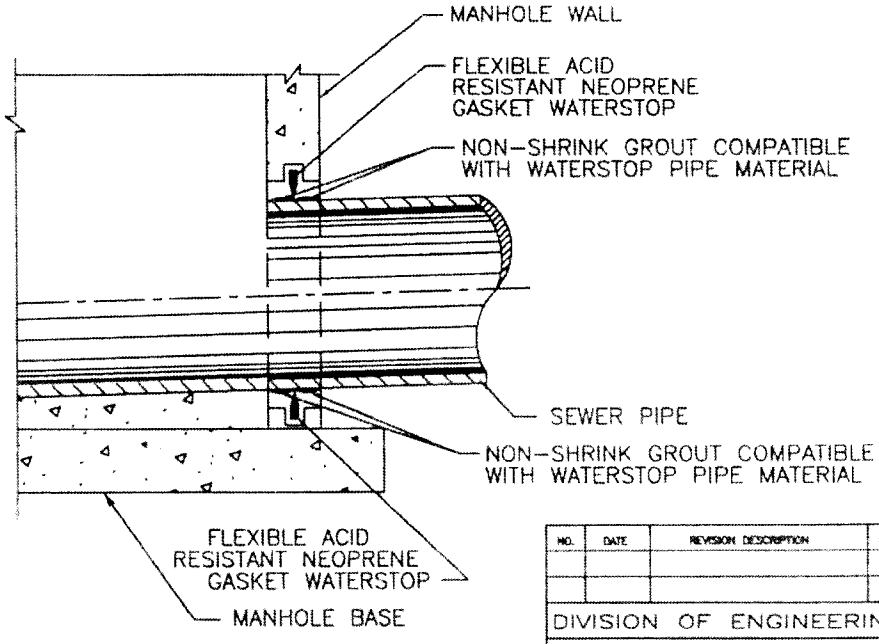
URBAN COUNTY ENGINEER/COMMISSIONER [redacted] DATE [redacted]





SECTION PLAN

SECTION A–A



WATER STOP DETAIL

NOTE:

MANHOLES SHALL PASS VACUUM TEST PER ASTM C–1244 PRIOR TO ACCEPTANCE.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

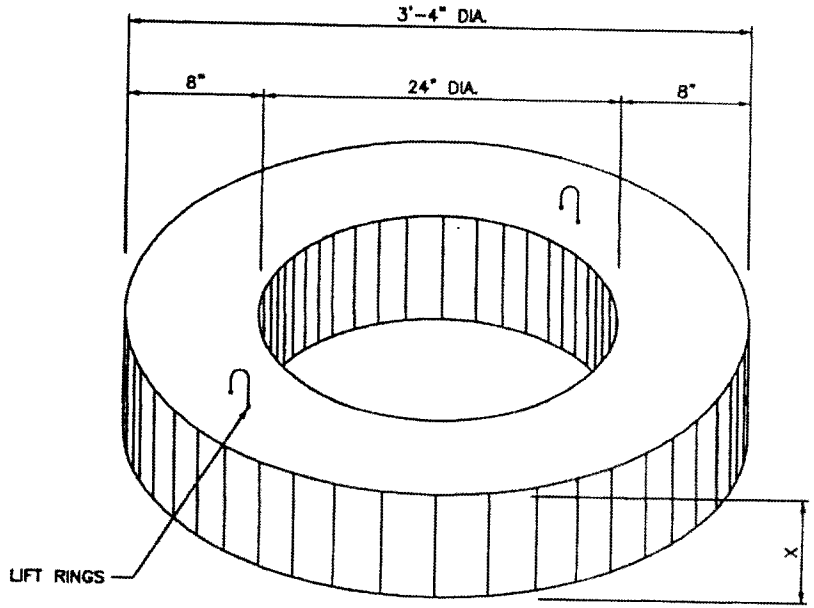
STANDARD MANHOLE JUNCTION AND WATER STOP DETAILS

STANDARD DRAWING NO. 213

APPROVAL
URBAN COUNTY ENGINEER — DATE 5/1/08
COMMISSIONER — DATE 5/1/08

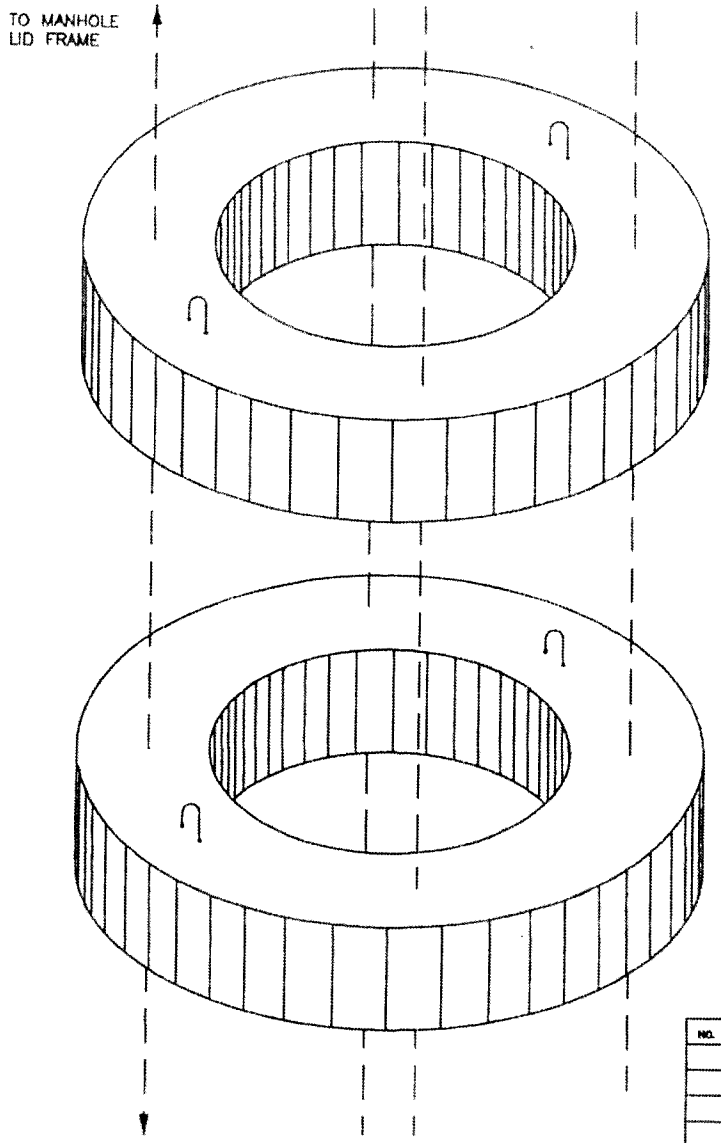
NOTES:

1. LIFT RINGS TO BE CUT BEFORE ADDING THE NEXT RING OR TOP.
2. COAT OUTSIDE AND IN BETWEEN ADJUSTING RINGS WITH SEMI-FIBRATED ASPHALT DAMPROOFING COMPOUND APPLIED BY BRUSH OR SPRAY.
3. GRADE RINGS WITH NON-PARALLEL SURFACES MAY BE USED TO ADJUST CASTING TO SLOPED SURFACE.
4. CONCRETE: CLASS "A" 3500 PSI AT 28 DAYS, AND IN ACCORDANCE WITH ASTM C-478, OR LATEST EDITION.
5. NO MORE THAN 2 GRADE RINGS MAY BE USED AT ONE LOCATION AND THE MAXIMUM HEIGHT OF ALL RINGS USED SHALL NOT EXCEED 12 INCHES.
6. APPLY MASTIC BETWEEN ALL JOINTS.



GRADE RING WIDTH CHART

X	WEIGHT LBS.
2"	140
3"	210
4"	279
6"	419
8"	560
12"	730



TO MANHOLE ECCENTRIC CONE SECTION

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

SEWER MANHOLE ADJUSTMENT GRADE RINGS

STANDARD DRAWING NO. 214

APPROVAL

URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE 5/1/08

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT

GENERAL NOTES

1. SHALLOW MANHOLE TYPE CONSTRUCTION SHOWN ON STD. DWG. 210 MAY BE USED FOR ALL MANHOLES UP TO 5' IN DEPTH.
2. ALL DIMENSIONS ARE BASED ON SIZE OF LARGEST PIPE IN MANHOLE.
3. MANHOLES FOR PIPE LARGER THAN 36" SHALL BE SPECIALLY DESIGNED.
4. BOTTOM SLAB OF MANHOLES SHALL BE SPECIALLY DESIGNED WITH REGARD TO AREA, THICKNESS, AND REINFORCING IN SITUATIONS WHERE HIGH WATER TABLE OR UNSTABLE SOIL CONDITIONS EXIST.
5. MANHOLE STEPS SHALL BE INSTALLED IN A VERTICAL LINE AND SHALL COMPLY WITH OSHA STANDARDS IN ALL RESPECTS.
6. ALL FLOORS OF MANHOLES SHALL SLOPE AT LEAST 1" PER FT. FROM WALL TO CHANNELS AND SHALL HAVE SMOOTH FLOAT AND BRUSH FINISH.
7. CHANNEL SURFACE OF MANHOLES FROM INLET TO OUTLET SHALL HAVE SMOOTH FLOAT FINISH.
8. ELEVATIONS OF PIPES IN MANHOLES SHALL BE SUCH THAT THE TOP OF ALL INFLUENT PIPES WILL BE AT AN EL-EVATION EQUAL TO OR GREATER THAN THE TOP OF THE EFFLUENT PIPE.
9. A MINIMUM FALL OF 0.10 FOOT SHALL BE PROVIDED.
10. BASE OF MANHOLES GREATER THAN 12' DEEP TO BE REINFORCED WITH NO. 4 BARS AT 12" BOTH WAYS.
11. ASPHALT DAMPROOFING COMPOUND IS REQUIRED ON PRECAST MANHOLES IN WET AREAS OR OTHERWISE AS DIRECTED BY THE ENGINEER.
12. LEAKS IN MANHOLES OBSERVED DURING CONSTRUCTION OR INSPECTION SHALL BE CORRECTED IMMEDIATELY.
13. MANHOLES SHALL PASS VACUUM TEST PER ASTM C-1244 PRIOR TO ACCEPTANCE.
14. ALL INLETS, INCLUDING LATERALS, MUST HAVE FLOW CHANNELS.
15. NEW CONNECTIONS TO EXISTING SANITARY SEWER MANHOLES MUST REPLACE EXISTING BRICK MANHOLES OR DAMAGED MANHOLES AT NO EXPENSE TO THE LFUCG.
16. FIELD POURED BASES (DOGHOUSE MANHOLES) SHALL ONLY BE ALLOWED WITH PRIOR APPROVAL OF THE LFUCG.

SPECIFICATIONS

1. CASTINGS SHALL BE ASTM A-48, CLASS 35.
2. CONCRETE FOR MANHOLES, CRADLE ENCASEMENT, ETC. SHOWN IN THESE DETAILS SHALL BE CLASS "A".
3. CONCRETE MANHOLE BARREL CONSTRUCTION SHALL CONFORM TO ASTM C-478 OR ITS LATEST REVISION.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

MANHOLE SIZE STANDARDS AND GENERAL NOTES FOR DEEP MANHOLES

STANDARD DRAWING NO. 216

APPROVAL _____ DATE 5/1/08
URBAN COUNTY ENGINEER

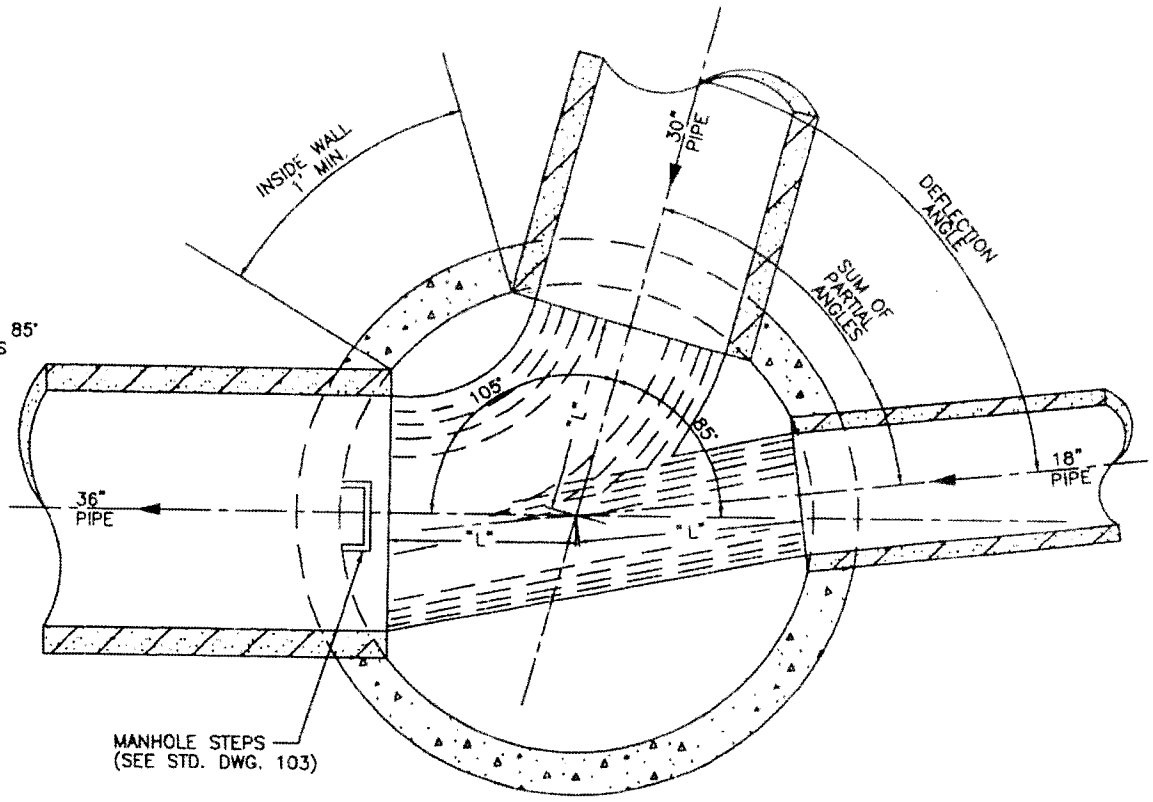
_____ DATE 5/1/08
COMMISSIONER

CIRCULAR MANHOLE NOTES:

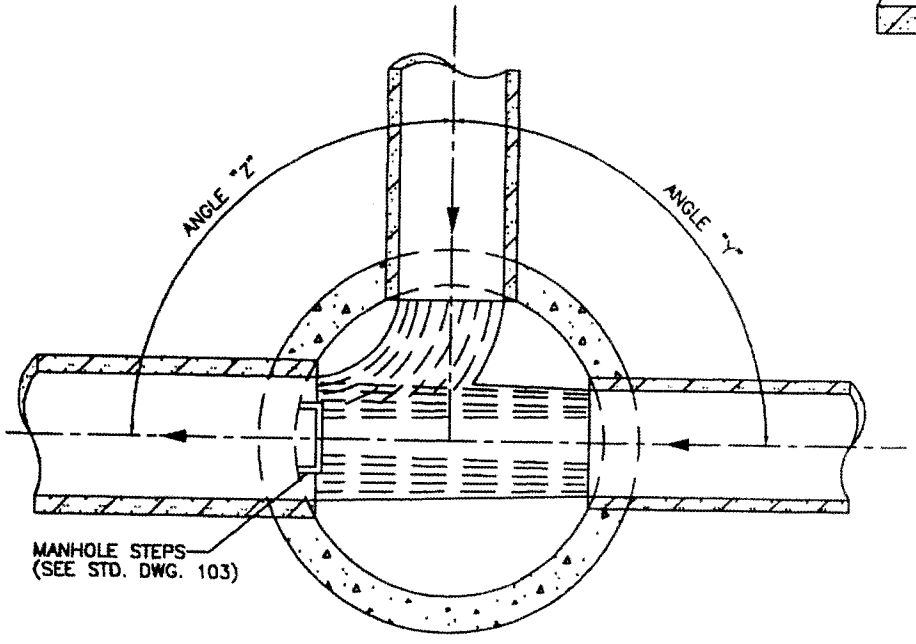
1. THE ANGLE BETWEEN ANY TWO PIPES (e.g. ANGLE "Y" OR "Z") MUST BE GREATER THAN THE SUM OF THE PARTIAL ANGLES. REFER TO SEPARATE STANDARD DRAWINGS FOR TABLE OF MINIMUM PARTIAL ANGLES. ANGLES SMALLER THAN LISTED ON TABLE SHALL REQUIRE LARGER MANHOLE SELECTION.
2. THE MAXIMUM DEFLECTION ANGLE BETWEEN ANY INCOMING PIPE AND THE CENTERLINE EXTENSION OF THE DISCHARGE PIPE SHALL BE NO MORE THAN 90° FOR PIPES UP TO 24" IN DIAMETER. THE MAXIMUM DEFLECTION ANGLE FOR 27" TO 36" PIPES SHALL BE 75°.

EXAMPLE FOR SANITARY MANHOLE SIZE SELECTION:

FOR MANHOLE SHOWN AT RIGHT, THE ANGLE BETWEEN THE 18" AND 30" PIPES IS 85° AND THE ANGLE BETWEEN THE 30" AND 36" PIPES IS 105°. THE TABLE INDICATES THAT FOR A 5'–0" DIAMETER MANHOLE THE MINIMUM PARTIAL ANGLE FOR AN 18" PIPE IS 34° AND FOR A 30" PIPE IS 50°. THE SUM OF THE PARTIAL ANGLES IS 84°, THIS SUM IS LESS THAN THE 85° THEREFORE, A 5'–0" MANHOLE DIAMETER IS ACCEPTABLE.



PLAN SECTION



PLAN SECTION

TABLE OF MINIMUM PARTIAL ANGLES FOR SANITARY MANHOLES

PIPE SIZE	MANHOLE SIZE			
	4'–0"		5'–0"	
	P. ANGLE	L. DIST.	P. ANGLE	L. DIST.
15"	38°	1'–10"	30°	2'–3"
18"	43°	1'–8"	34°	2'–3"
24"	53°	1'–6"	39°	2'–2"
27"	–	–	45°	2'–0"
30"	–	–	50°	1'–11"

NO.	DATE	REVISION DESCRIPTION	BY

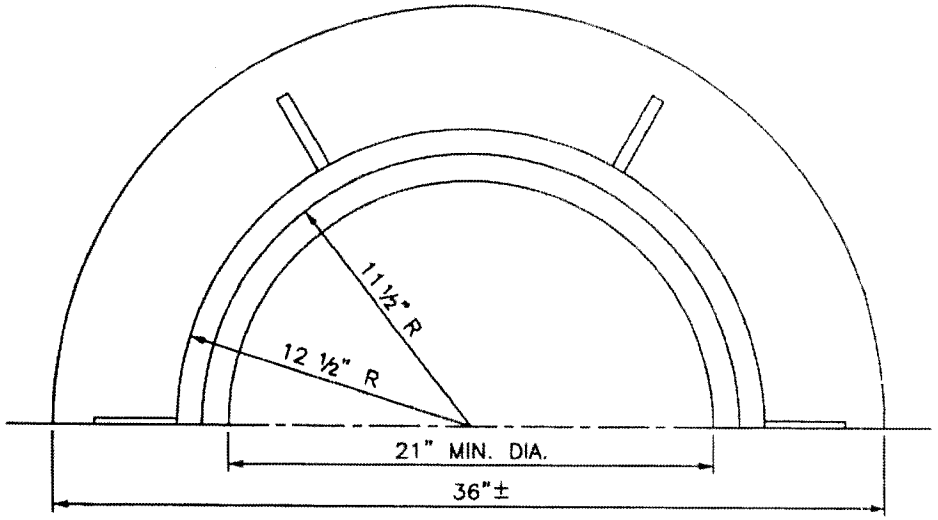
DIVISION OF ENGINEERING

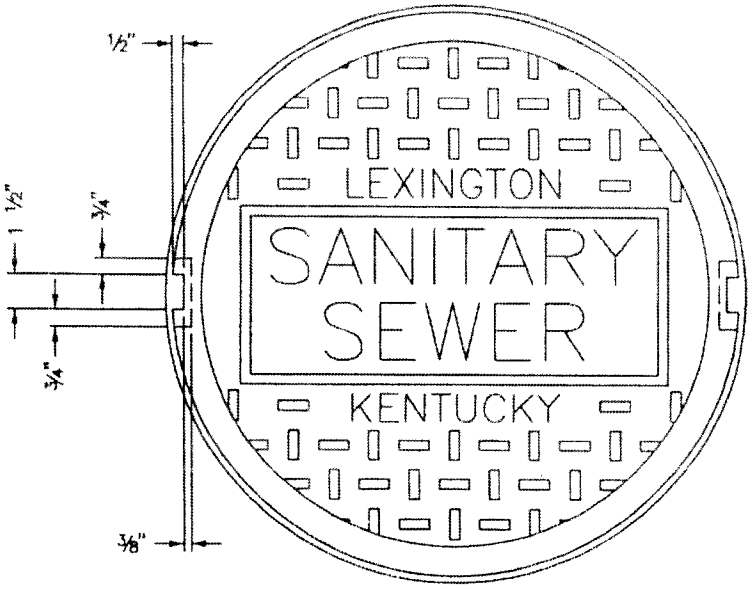
DEFLECTION ANGLE CRITERIA FOR SANITARY MANHOLES

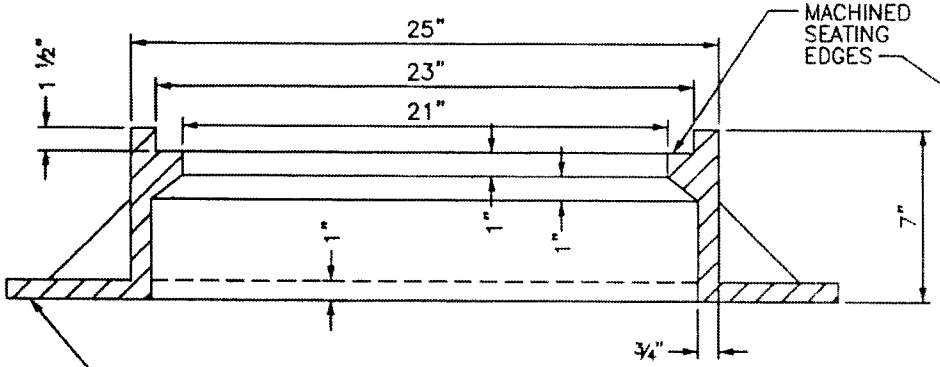
STANDARD DRAWING NO. 217

APPROVED: [signature] 5/1/08 DATE

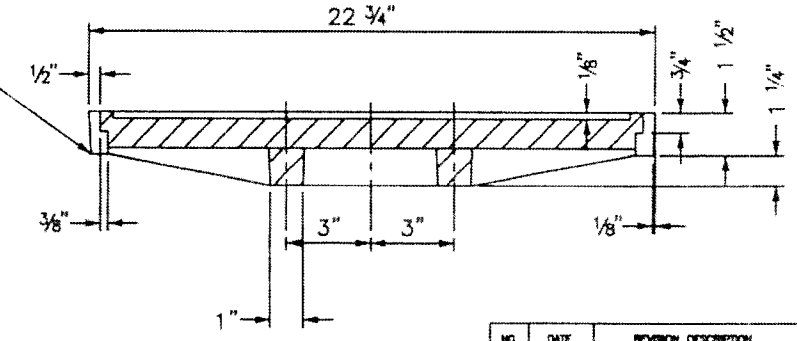
URBAN COUNTY ENGINEER / COMMISSIONER [signature] 5/1/08 DATE







FRAME DETAIL



COVER DETAIL

NOTE:

MANHOLE FRAME & LID ASSEMBLY SHALL HAVE A MINIMUM LID WEIGHT OF 120 LBS. AND A TOTAL MINIMUM FRAME & LID WEIGHT OF 305 LBS. WITH ALL STEEL IN ACCORDANCE WITH ASTM A-48 CLASS 35 SPEC.

NO.	DATE	REVISION DESCRIPTION	BY

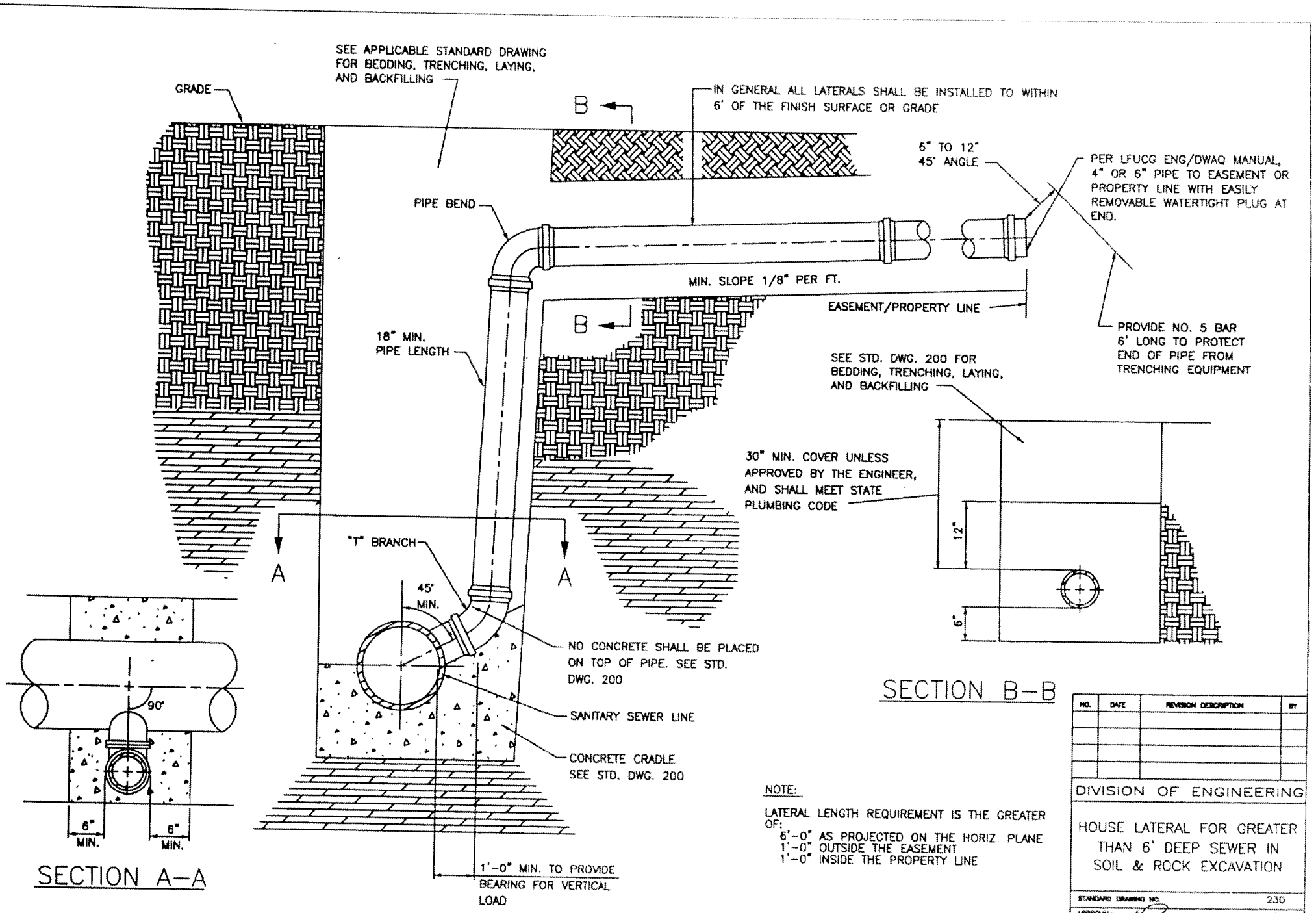
DIVISION OF ENGINEERING

STANDARD CIRCULAR
MANHOLE FRAME & COVER

STANDARD DRAWING NO. 220

APPROVAL: URBAN COUNTY ENGINEER / COMMISSIONER — DATE 5/1/08

DATE 5/1/08



SECTION A–A

SECTION B–B

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'-0" AS PROJECTED ON THE HORIZ. PLANE
- 1'-0" OUTSIDE THE EASEMENT
- 1'-0" INSIDE THE PROPERTY LINE

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL & ROCK EXCAVATION

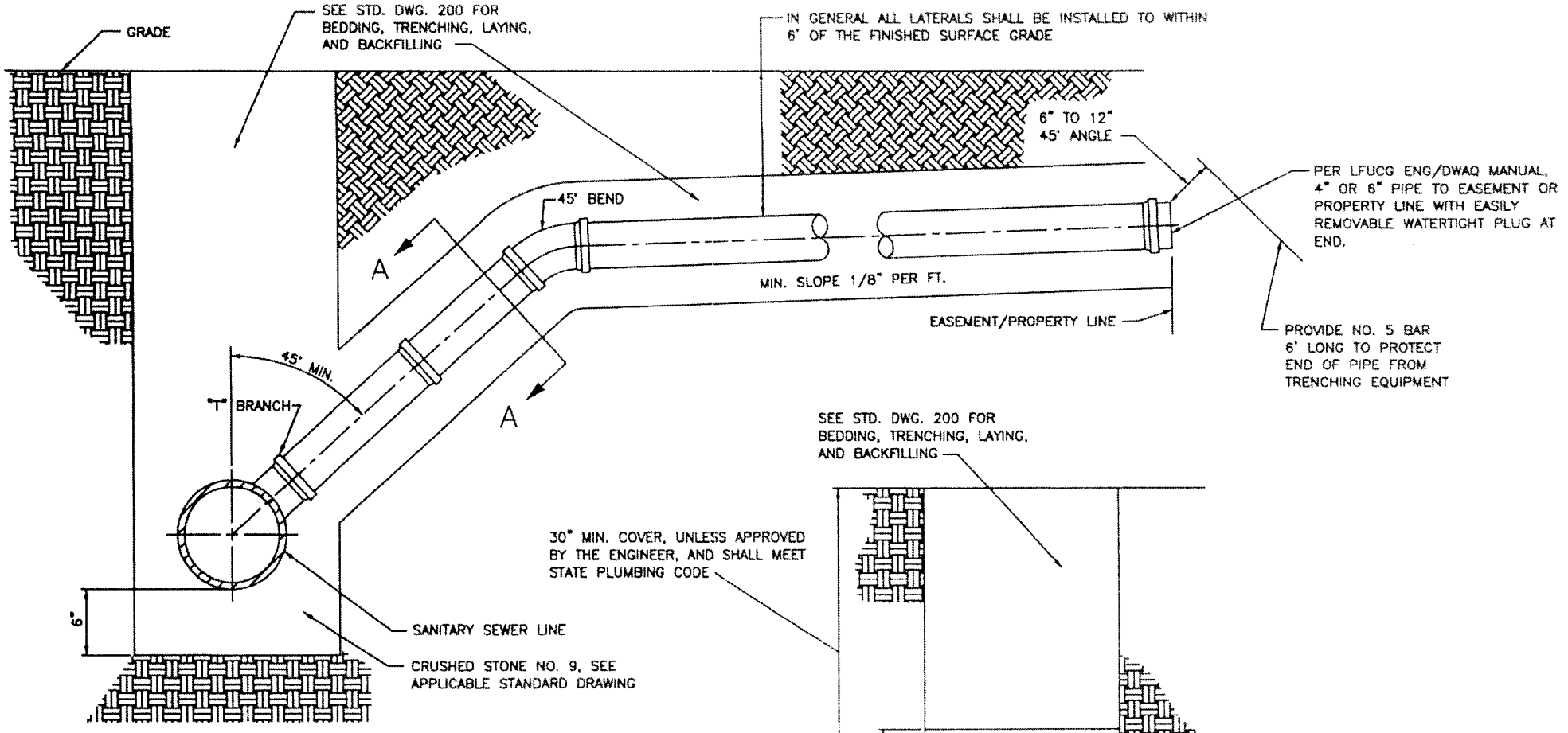
STANDARD DRAWING NO. 230

APPROVAL _____ 5/1/08 DATE

URBAN COUNTY ENGINEER

COMMISSIONER _____ 5/1/08 DATE

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



SECTION A–A

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'–0" AS PROJECTED ON THE HORIZ. PLANE
- 1'–0" OUTSIDE THE EASEMENT
- 1'–0" INSIDE THE PROPERTY LINE

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

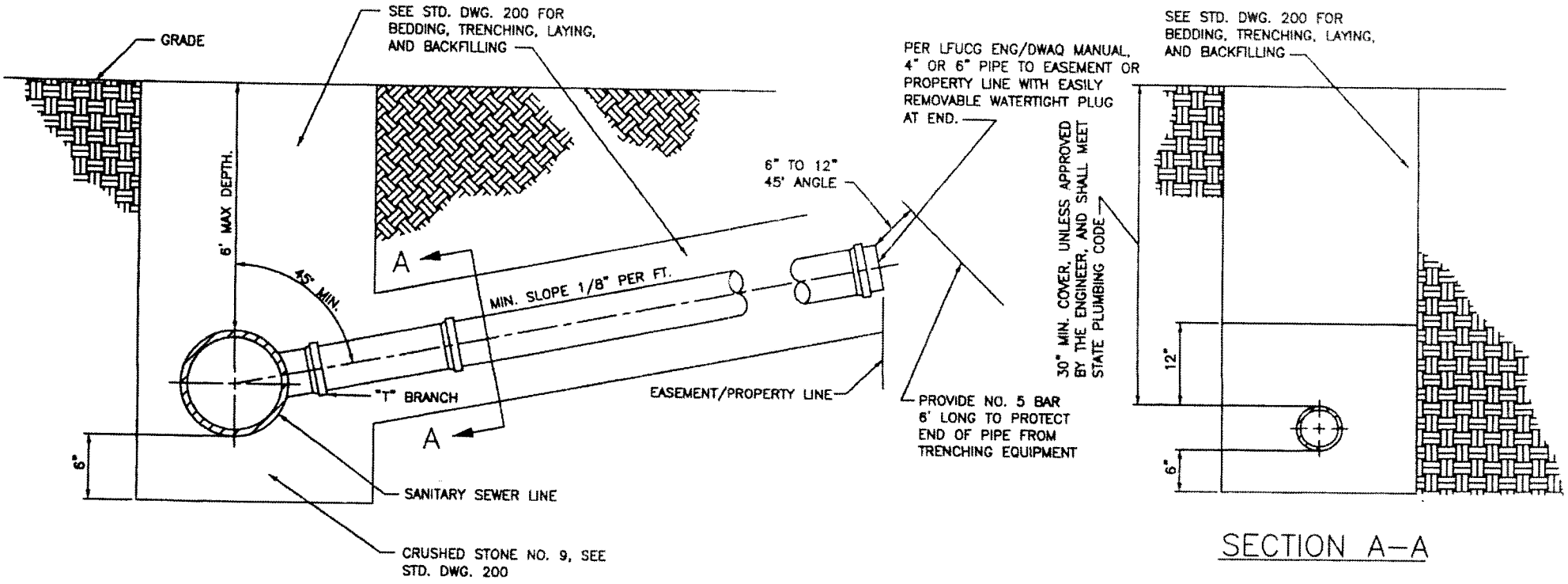
HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL

STANDARD DRAWING NO. 231

APPROVED _____ DATE 5/1/08

URBAN COUNTY ENGINEER / COMMISSIONER _____ DATE 5/1/08

LEXINGTON–FAYETTE URBAN COUNTY GOVERNMENT, DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT



SECTION A–A

NOTE:

LATERAL LENGTH REQUIREMENT IS THE GREATER OF:
- 6'–0" AS PROJECTED ON THE HORIZ. PLANE
- 1'–0" OUTSIDE THE EASEMENT
- 1'–0" INSIDE THE PROPERTY LINE

NO.	DATE	REVISION DESCRIPTION	BY

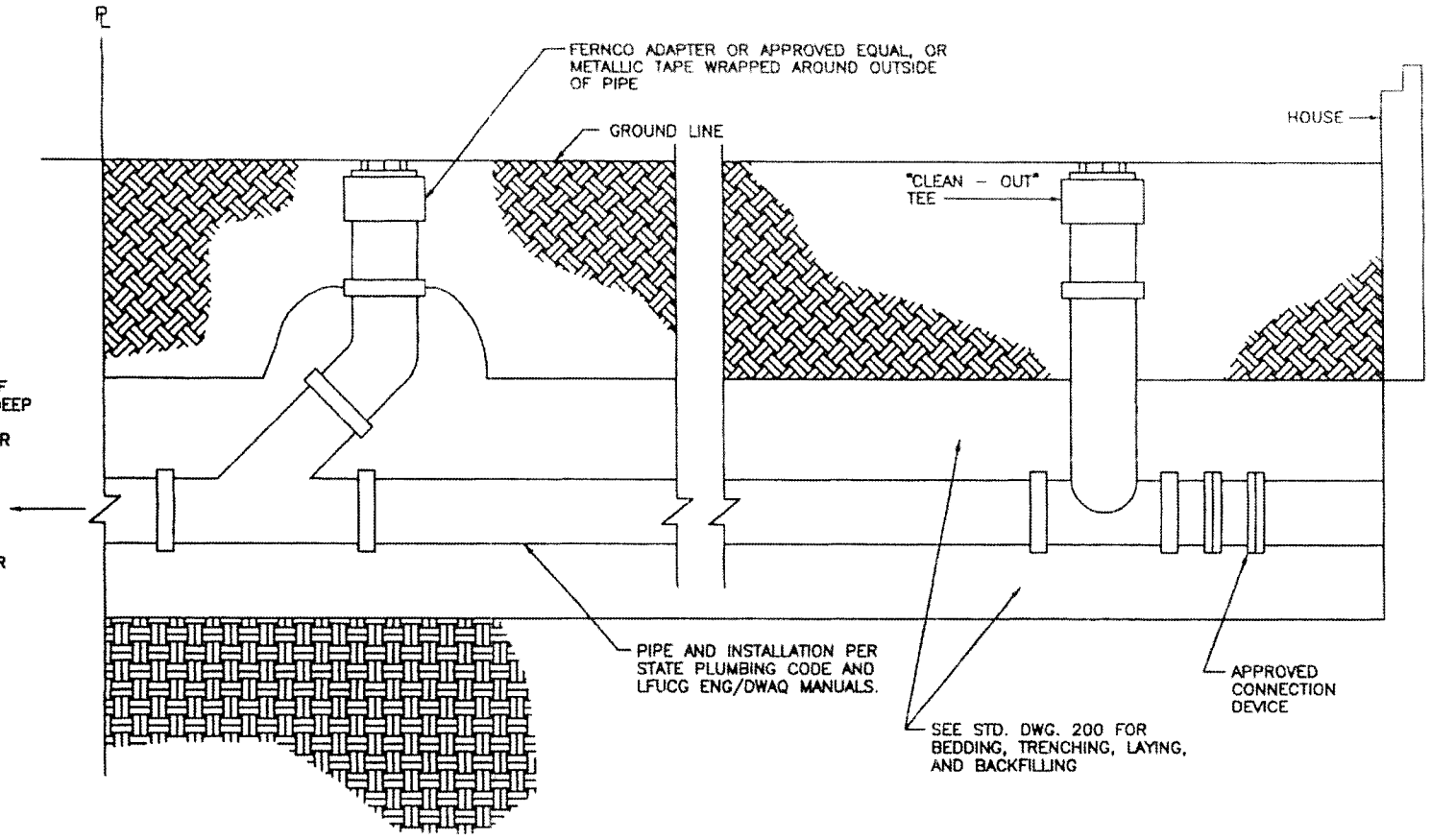
DIVISION OF ENGINEERING

HOUSE LATERAL
FOR SHALLOW SEWER
IN SOIL OR ROCK

STANDARD DRAWING NO. 232

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

COMMISSIONER — DATE



REFER TO STD. DWG. 231 FOR DETAILS OF "HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL" AND STD. DWG. 230 FOR DETAILS OF "HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL AND ROCK EXCAVATION"

REFER TO STD. DWG. 232 FOR DETAILS OF "HOUSE LATERAL FOR SHALLOW SEWER IN SOIL OR ROCK"

NOTE:

SEWER PIPE FROM HOUSE TO THE LONG SWEEP "L" MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LFUCG ENG/DWAG MANUALS.

NO.	DATE	REVISION DESCRIPTION	BY

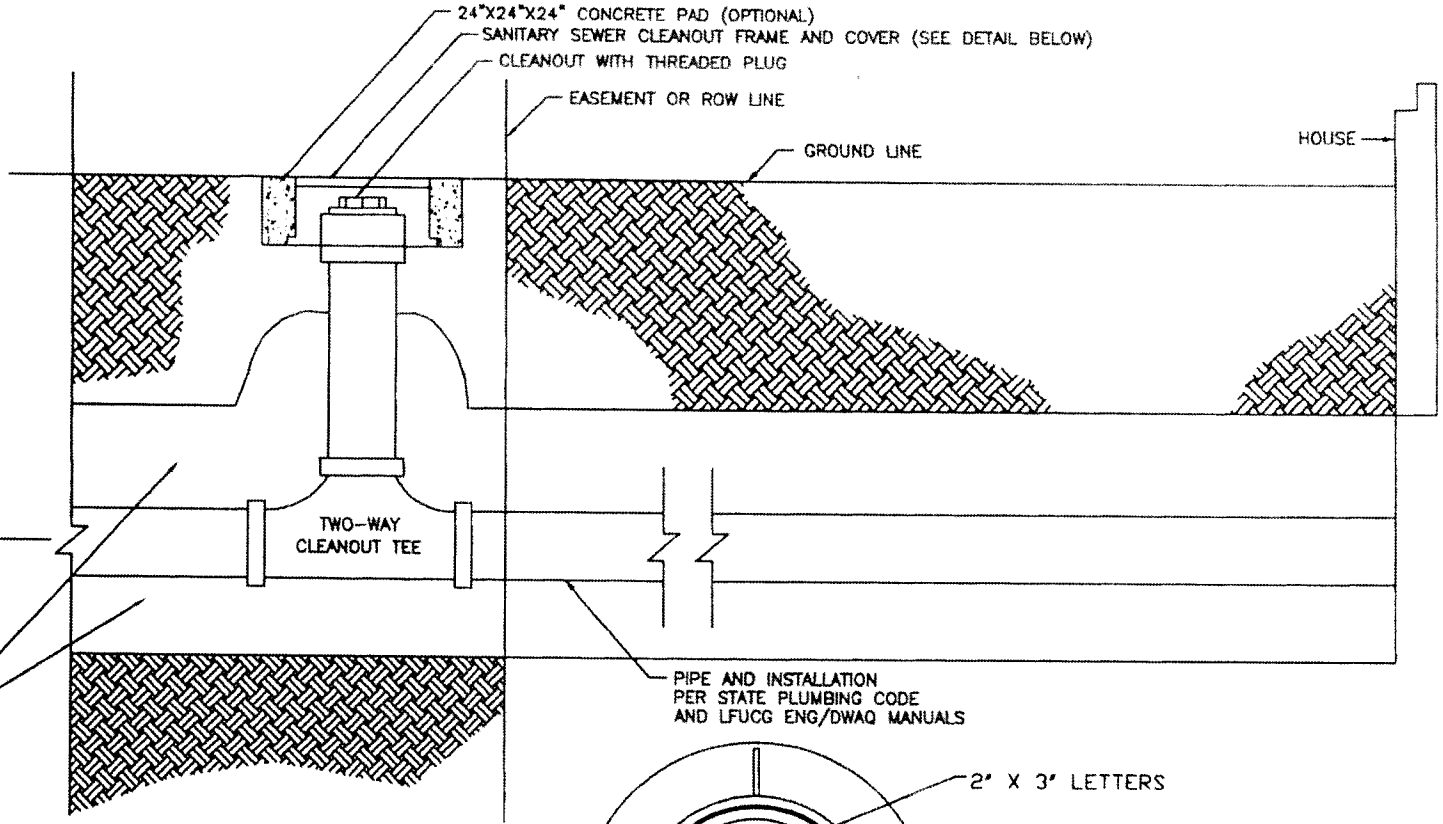
DIVISION OF ENGINEERING

LATERAL CLEANOUT IN NON-PAVED AREAS AND YARDS

STANDARD DRAWING NO. 233

APPROVED: URBAN COUNTY ENGINEER — DATE 5/1/08

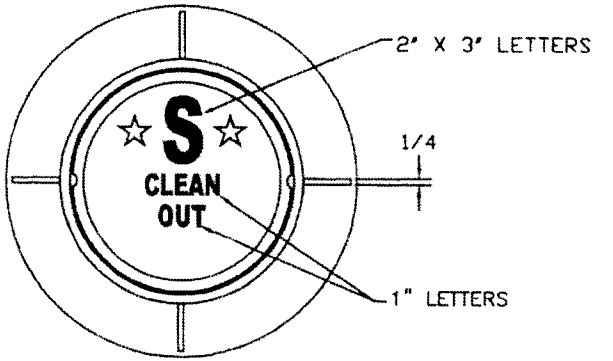
COMMISSIONER — DATE 5/1/08

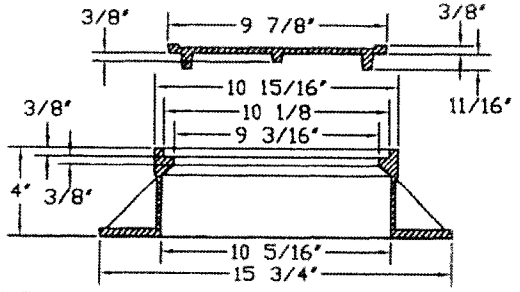


REFER TO STD. DWG. 231 FOR DETAILS OF "HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL" AND STD. DWG. 230 FOR DETAILS OF "HOUSE LATERAL FOR GREATER THAN 6' DEEP SEWER IN SOIL AND ROCK EXCAVATION"

REFER TO STD. DWG. 232 FOR DETAILS OF "HOUSE LATERAL FOR SHALLOW SEWER IN SOIL OR ROCK"

SEE STD. DWG. 200 FOR BEDDING, TRENCHING, LAYING, AND BACKFILLING





NOTES:

SEWER PIPE FROM HOUSE TO CLEANOUT MUST BE IN ACCORDANCE WITH STATE PLUMBING CODE AND LFUCG ENG/DWAQ MANUALS.

TWO-WAY CLEANOUT TEE IS TO BE INSTALLED BY THE PLUMBER AND OR CONTRACTOR PRIOR TO CONNECTION OF THE LATERAL TO PUBLIC SANITARY SEWER LINE.

CLEANOUT TO BE INSTALLED AT THE END OF PUBLICLY MAINTAINED SEWER. POINT TO BE DETERMINED BY THE DIVISION OF ENGINEERING.

NO.	DATE	REVISION DESCRIPTION	BY

DIVISION OF ENGINEERING

RIGHT OF WAY OR EASEMENT LATERAL CLEANOUT IN NON-PAVED AREAS AND YARDS

STANDARD DRAWING NO. 234

APPROVED _____ 5/1/08
URBAN COUNTY ENGINEER DATE

_____ 5/1/08
COMMISSIONER DATE

APPENDIX B

L. E. GREGG ASSOCIATES/GREGG LABORATORIES

1026 East New Circle Road Lexington, Kentucky 40505 (859) 252-7558 FAX:(859) 255-0940

E mail: Legreggassoc@aol.com WEB: www.legreggassoc.2e.com

Larry W. Snedegar, PE, PG, ACD
James P. Leach, PG
James E. House

September 23, 2002

Mr. Fred Eastridge, PE, PLS
Sherman Carter Barnhart, PSC
2405 Harrodsburg Road
Lexington, Kentucky 40504

Re: Meadows-Northland-Arlington
Street Renewal
Lexington, Kentucky

Dear Mr. Eastridge:

This is our report on the information obtained at the soil auger borings performed within the listed streets. Results of the laboratory analyses are attached for your review.

Bryan Avenue:

Sta. 1+93, 19.4' Rt. C.L.

0.0' - 0.8'	Topsoil with gravel.
0.8' - 3.0'	FILL MATERIAL, Light brown to orange brown, damp, high plasticity, stiff Lean CLAY (CL) with sand (crushed aggregate limestone), A-7-6(19). Bag sample obtained. **CBR = 1.2%**
3.0' - 5.0	Light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin layers of weathered limestone.
5.0'	Power auger refusal

Sta.4+04.5, 22.4' RT. C.L.

0.0' - 0.7'	Topsoil with gravel.
0.7' - 3.7'	Brown to orange/brown, damp, high plasticity, stiff Lean CLAY (CL) with Sand (phosphate nodules).
3.7'	Power auger refusal.

Sta.5+77, 19.7' RT. C.L.

0.0' - 0.5'	Topsoil with gravel.
0.5' - 1.9'	FILL MATERIAL: Light brown to orange brown, damp, high plasticity, stiff Lean CLAY (CL) with sand (crushed aggregate limestone)
1.9'	Top of unmarked utility pipe. Blue mark 4.7' to right side of boring and yellow mark at 6.0' to left side. No mark by utility companies for pipe encountered at a depth of 1.9'.

Sta. 5+77, 21.5' RT. C.L.

0.5' - 2.0'	FILL MATERIAL: Light yellowish brown, damp, medium plasticity, stiff Clayey GRAVEL with Sand (GC), A-6(1).bag sample obtained. **CBR = 1.1%**
2.0' - 3.7'	Light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin layers of weathered limestone.
3.7'	Power auger refusal.

Sta.9+08, 23.9' RT. C.L.

0.0' - 0.5'	Topsoil with gravel and glass.
0.5' - 2.2	FILL MATERIAL: Light yellowish brown, damp, medium plasticity, medium Clayey GRAVEL with Sand (GC) and glass fragments.
2.2' - 5.8'	Brown to yellow/brown, damp, medium plasticity, stiff sandy (phosphate nodules) SILT (ML), A-7-6(14). Bag sample obtained. **CBR = 1.8%**
5.8' - 6.8'	Light brown to yellow/brown, damp, high plasticity, medium Elastic SILT (MH) with weathered chert fragments.
6.2'	Static water level.
6.8'	Power auger refusal

Carlisle Avenue:

Sta.1+41.5, 9.3' RT. C.L.

0.0' - 0.5'	Asphalt.
0.5' - 1.0'	Crushed aggregate.
1.0' - 6.5'	Light brown/tan, gray mottled, damp, very high plasticity, stiff Elastic SILT (MH) with phosphate nodules, A-7-5(40). Bag sample obtained. **CBR = 1.6%**
6.5' - 7.4'	Weathered Limestone.
7.4'	Power auger refusal.

Sta.3+91.6, 9.4' RT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 0.9'	Crushed aggregate.
0.9' - 1.7'	Brown to light brown, damp, high plasticity, medium SILT (ML) with phosphate nodules.
1.7' - 7.8'	Light brown/tan, gray mottled, damp, very high plasticity, stiff Elastic SILT (MH) with phosphate nodules.
7.8'	Power auger refusal.

Sta.6+72.5, 9.4' RT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 0.9'	Crushed aggregate.
0.9' - 3.9'	Brown to light brown, damp, medium plasticity, medium Lean CLAY (CL) with Sand (Phosphate nodules), A-7-6(14). Bag sample obtained. **CBR = 4.1%**
3.9' - 11.0'	Brown to light brown, gray mottled, damp, high plasticity, stiff Elastic SILT (MH) with Sand (weathered chert fragments).
11.0' - 11.8'	Weathered Limestone
11.8'	Power auger refusal.

Sta.9+19.8, 9.4' LT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 0.9'	Crushed aggregate.
0.9' - 5.4'	Brown to light brown, gray mottled, damp, high plasticity, stiff Elastic SILT (MH) with Sand (weathered chert fragments).
5.4'	Power auger refusal.

Sta.11+73.2, 9.5' LT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 1.2'	Crushed aggregate.
1.2' - 5.8'	Light brown, gray mottled, damp, high plasticity, stiff, Sandy (weathered chert fragments) Elastic SILT (MH), A-7-5(18). Bag sample obtained. **CBR = 1.8%**
5.8'	Power auger refusal.

Locust Avenue:

Sta.1+34, 10.2' RT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 1.1'	Crushed aggregate.
1.1' - 3.5'	Brown to orange/brown, damp, very high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules), A-7-5(43). Bag sample obtained. **CBR = 2.1%**
3.5'	Power auger refusal.

Sta.3+72.5, 9.2' RT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 0.8'	Crushed aggregate.
0.8' - 5.0'	Brown to orange/brown, damp, very high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
5.0'	Power auger refusal.

Sta.6+16.7, 9.4' RT. C.L.,

0.0' - 0.3'	Asphalt
0.3' - 1.1'	Crushed aggregate intermixed with clay.
1.1' - 5.9'	Brown/tan, gray mottled, damp, high plasticity, stiff, Sandy (weathered chert fragments) Elastic SILT (MH), A-7-5(12). Bag sample obtained. **CBR = 4.0%**
5.9'	Power auger refusal.

Sta.9+12.5, 10.3' RT. C.L.

0.0' - 0.3'	Asphalt
0.3' - 0.8'	Crushed aggregate.
0.8' - 5.8'	Reddish brown to dark brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
5.8'	Power auger refusal.

Sta.12+11, 9.3' RT. C.L.

0.0' - 0.4'	Asphalt

0.4' - 0.9'	Crushed aggregate intermixed with clay.
0.9' - 4.6'	Reddish brown to dark brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules), A-7-6(28). Bag sample obtained. **CBR = 1.2%**
4.6'	Power auger refusal.

Oak Hill Drive:

Sta.1+85, 6.6' RT. C.L.,

0.0' - 0.6'	Asphalt
0.6' - 0.8'	Crushed aggregate intermixed with clay.
0.8' - 3.7'	Dark brown, damp, slight plasticity, medium SILT (ML), A-4(7). Bag sample obtained. **CBR = 3.5%**
3.7' - 6.3'	Reddish brown to dark brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
6.3' - 9.6'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand.
9.6'	Power auger refusal.

Sta.4+37, 7.5' RT. C.L.

0.0 - 0.2'	Asphalt
0.2' - 0.6'	Concrete
0.6' - 3.4'	Dark brown, damp, slight plasticity, medium SILT (ML).
3.4' - 3.8'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin limestone layers.
3.8'	Power auger refusal

Sta.6+61.3, 8.8' RT. C.L.

0.0' - 0.2'	Asphalt
0.2' - 0.6'	Concrete
0.6' - 8.8'	Reddish brown to dark brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
8.8'	Power auger refusal.

Sta.9+33, 8.3' RT. C.L.,

0.0' - 0.3'	Asphalt
0.3' - 1.1'	Crushed aggregate.
1.1' - 3.8'	Medium brown/orange brown, damp, very high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules), A-7-6(25). Bag sample obtained. **CBR = 1.8%**
3.8'	Power auger refusal.

Sta.12+10.3, 7.3' RT. C.L.

0.0' - 0.4'	Asphalt
0.4' - 0.8'	Crushed aggregate with clay intermixed.
0.8' - 1.6'	Reddish brown to dark brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
1.6' - 2.9'	Medium brown/orange brown, damp, very high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).

2.9' - 4.7'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin limestone layers
4.7'	Power auger refusal

Sta.14+52.8, 6 RT. C.L.

0.0' - 0.7'	Asphalt
0.7' - 1.2'	Crushed aggregate intermixed with clay.
1.2' - 2.2'	Light brown to dark brown, damp, medium plasticity, medium Sandy (weathered chert fragments) and phosphate nodules) Lean CLAY (CL), A-6(5). Bag sample obtained. **CBR = 3.4%**
2.2' - 6.2'	Brown to reddish brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (weathered chert fragments), A-7-6(23). Bag sample obtained. **CBR = 1.6%**
6.2'	Power auger refusal.

Park View Avenue:

Sta.0+99.7, 14.3' RT. C.L.

0.0' - 0.5'	Concrete
0.5' - 0.7'	Crushed aggregate
0.7' - 5.2'	Light brown to orange brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules), A-7-6(30). Bag sample obtained. **CBR = 1.1%**
5.2'	Power auger refusal.

Sta.2+63, 13' RT. C.L.

0.0' - 0.6'	Concrete
0.6' - 0.9'	Crushed aggregate.
0.9' - 2.1'	Light brown to orange brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
2.1'	Power auger refusal.

Sta.4+58.2, 13.2' RT. C.L.

0.0' - 0.5'	Asphalt
0.5' - 0.9'	Crushed aggregate
0.9' - 3.7'	Brown to yellow/brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules), A-7-6(24). Bag sample obtained. **CBR = 0.7%**
3.7' - 4.9'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin layers of weathered Limestone.
4.9'	Power auger refusal.

Sta.7+03.7, 13.5' RT. C.L.

0.0' - 0.4'	Concrete
0.4' - 0.7'	Crushed aggregate.
0.7' - 2.5'	Brown to yellow/brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
2.5' - 3.5'	Brown to dark brown, damp, high plasticity, medium, Lean CLAY (CL) with sand (phosphate).
3.5' - 10.4'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with

	Sand (weathered chert fragments).
10.4'	Power auger refusal.

Sta.9+74, 12.4' RT. C.L.

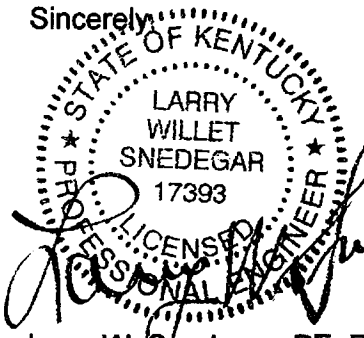
0.0' - 0.4'	Concrete
0.4' - 0.6'	Crushed aggregate.
0.6' - 7.2'	Brown to yellow/brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
7.2'	Power auger refusal.

Sta.12+89.6, 9.5' RT. C.L.

0.0' - 0.5'	Asphalt
0.5' - 0.7'	Crushed aggregate.
0.7' - 4.5'	FILL MATERIAL: Brown to dark brown, damp, high plasticity, medium Sandy Lean CLAY (CL) with Gravel (crushed aggregate limestone and brick fragments), A-7-6(10). Bag sample obtained. **CBR = 3.2%**
4.5' - 6.8'	Brown to dark brown, damp, high plasticity, medium, Lean CLAY (CL) with sand (phosphate).
6.8' - 10.4'	Brown to yellow/brown, damp, high plasticity, stiff Fat CLAY (CH) with Sand (phosphate nodules).
10.4' - 11.5'	Brown to light brown, damp, high plasticity, stiff Fat CLAY (CH) with thin layers of weathered Limestone.
11.5'	Power auger refusal.

If you have any questions concerning this information, please contact me.

Sincerely,



9/23/02

Larry W. Snedegar, PE, PG, ACD
President
L. E. Gregg Associates, Inc.

c: File 2095

COMPACTION TEST REPORT

Curve No.: 9

Date: 9-21-02

Project No.: 2095

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.8'-3.0'

Remarks: BRYAN AVE. STA.1+93, 19.4' RT. C.L.
LAB #13902

MATERIAL DESCRIPTION

Description: LIGHT BROWN/GRAY/ORANGE BROWN, DAMP, HIGH PLASTICITY, STIFF LEAN CLAY (CL) WITH SAND (CRUSHED AGGREGATE LIMESTONE), A-7-6(19).

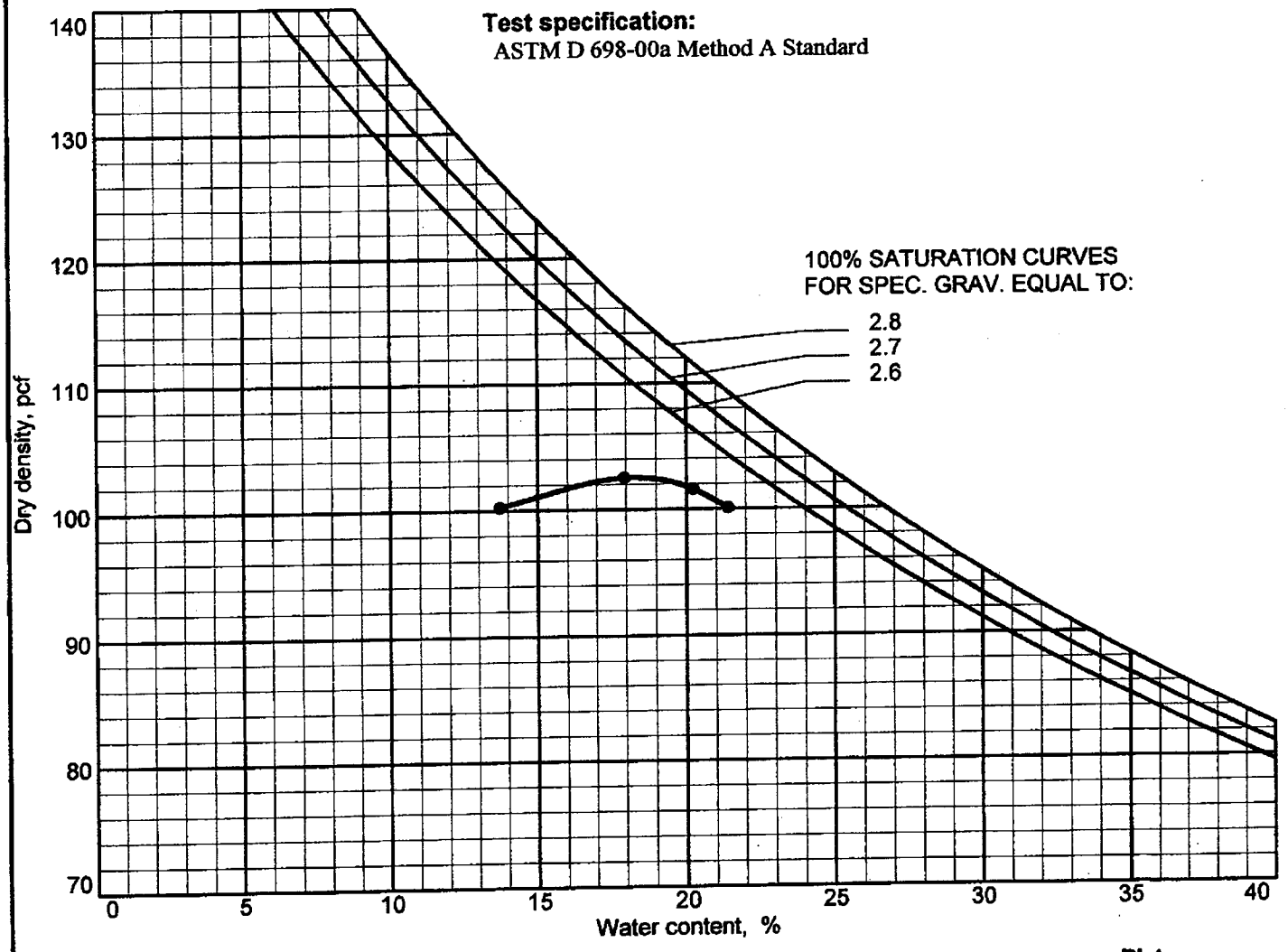
Classifications - **USCS:** CL **AASHTO:** A-7-6(19)

Nat. Moist. = 18.6 %
Liquid Limit = 49
% > No.4 = 9.1 %

Sp.G. = 2.77
Plasticity Index = 29
% < No.200 = 70.6 %

TEST RESULTS
Maximum dry density = 102.5 pcf
Optimum moisture = 18.5 %

Test specification:
ASTM D 698-00a Method A Standard



Plate

GREGG LABORATORIES, INC.

COMPACTION TEST REPORT

Curve No.: 7

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 2.2'-5.2'

Remarks: BRYAN AVE., STA.9+08, 23.9' RT. C.L.
LAB #13900

MATERIAL DESCRIPTION

Description: BROWN TO YELLOW/BROWN, DAMP, MEDIUM PLASTICIT, STIFF, SANDY (PHOSPHATE NODULES) SILT (ML), A-7-6(14).

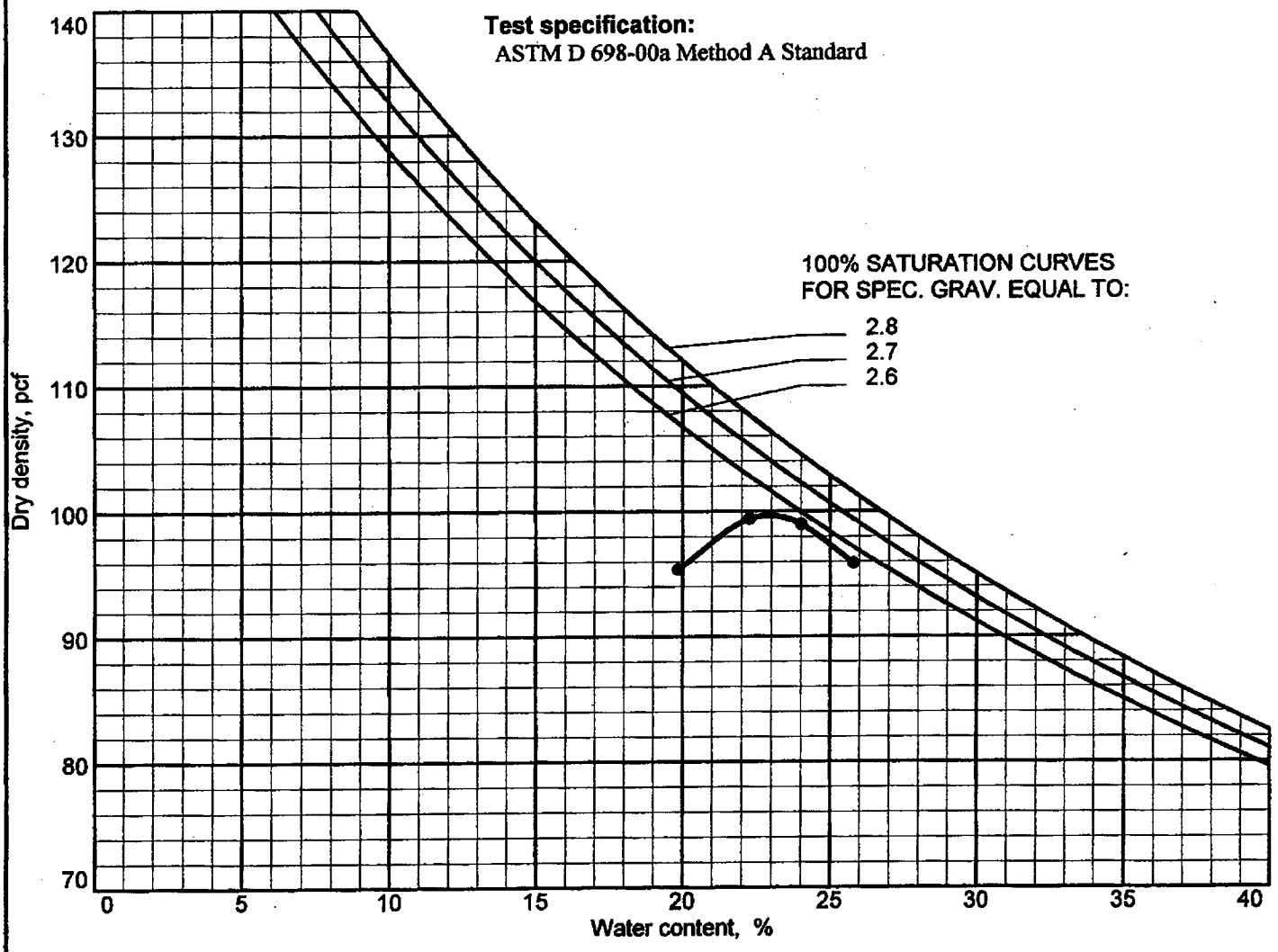
Classifications - **USCS:** ML **AASHTO:** A-7-6(14)

Nat. Moist. = 29.7 %
Sp.G. = 2.68

Liquid Limit = 48
Plasticity Index = 20

% > No.4 = 6.4 %
% < No.200 = 69.2 %

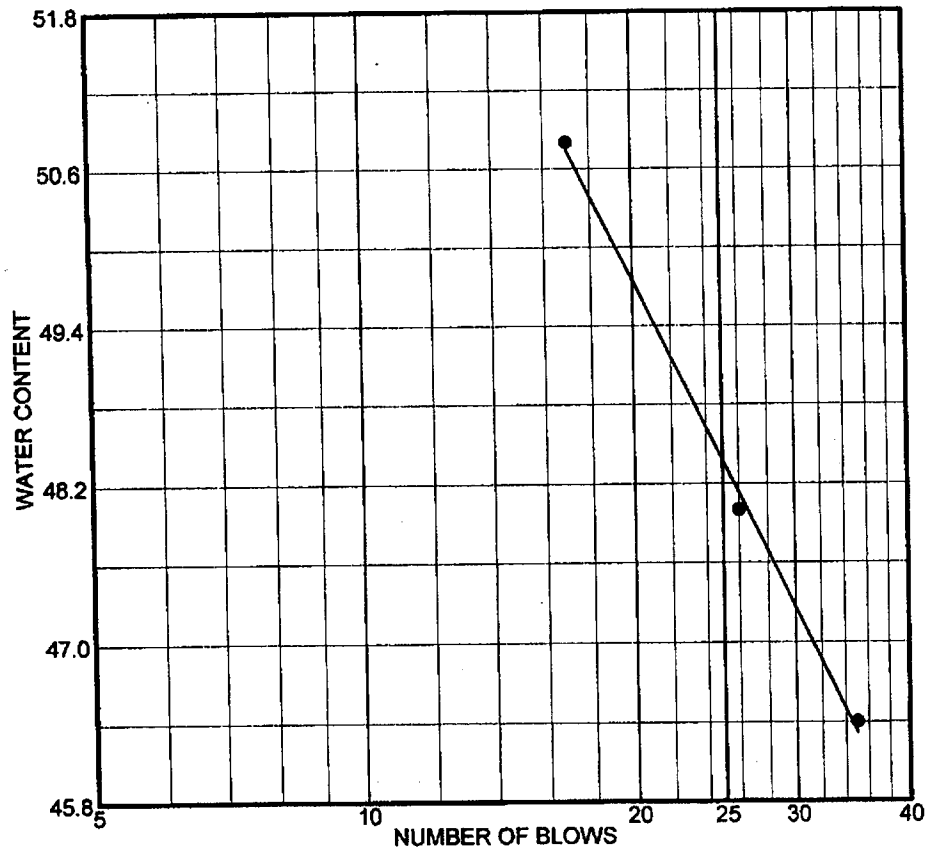
TEST RESULTS
Maximum dry density = 99.5 pcf
Optimum moisture = 23 %

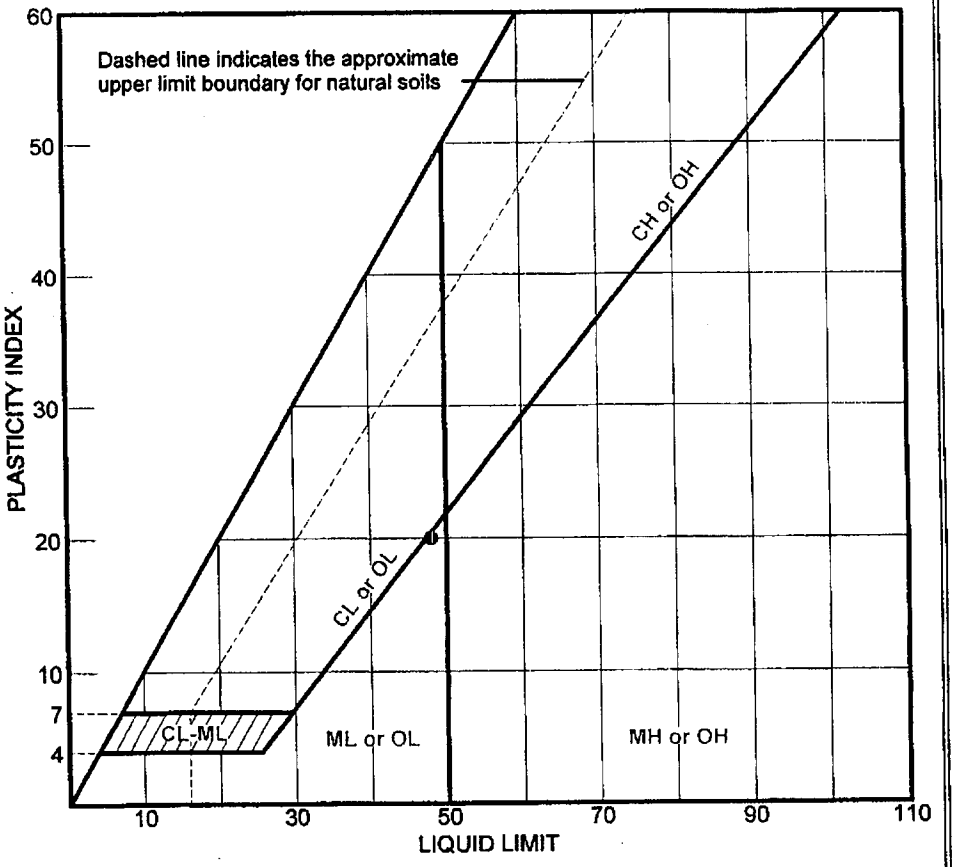


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





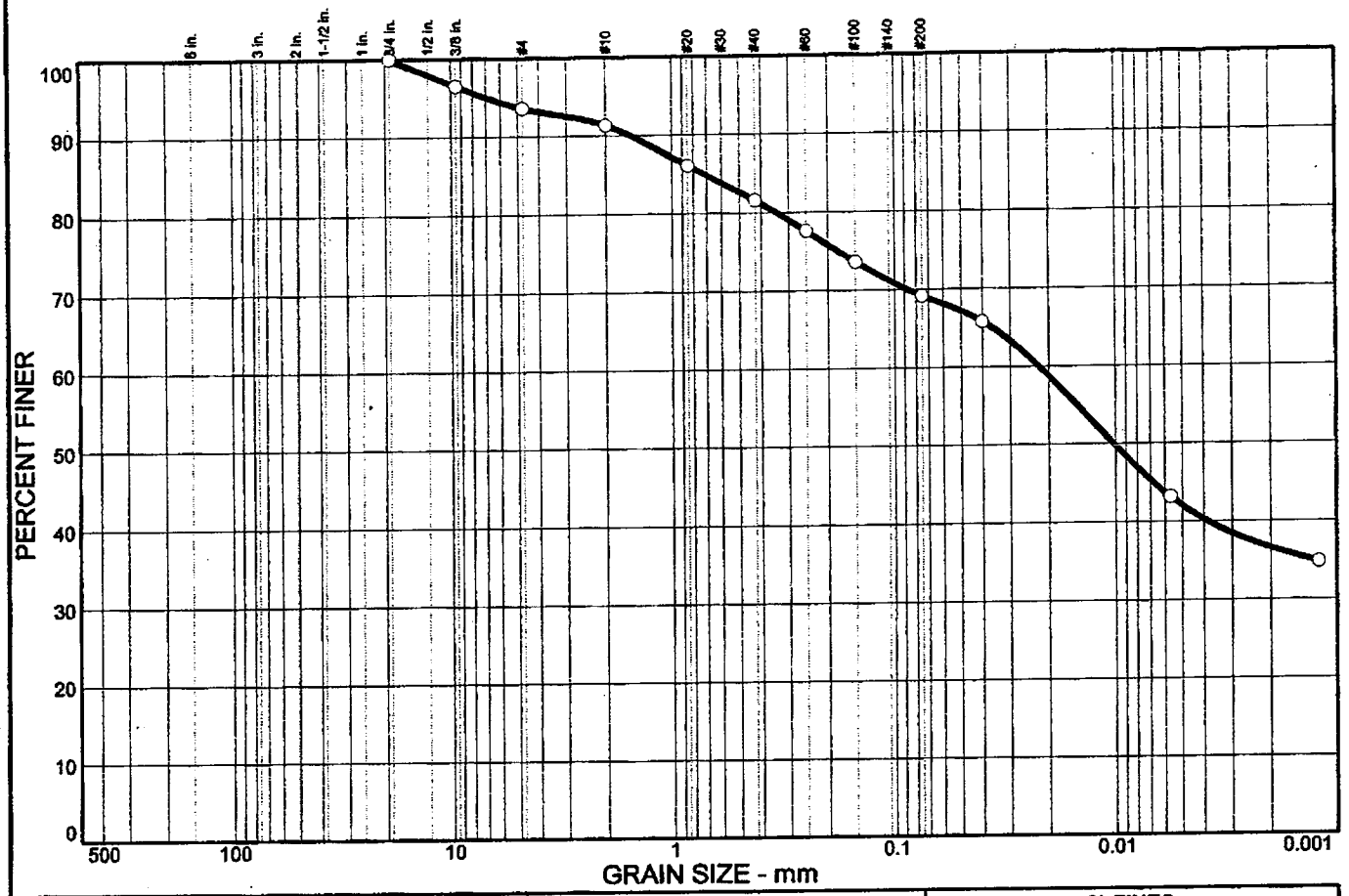
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	BRYAN AVE. STA.9+08, 23.9' RT. C.L.	13890	2.2'-5.2'	8-22-02	ML	BROWN TO YELLOW/BROWN, DAMP, MEDIUM PLASTICIT, STIFF, SANDY (PHOSPHATE NODULES) SILT (ML), A-7-6(14).	29.7	48	20

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● BRYAN AVE. STA.9+08, 23.9' RT. C.L.
LAB #13900

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	6.4	2.3	9.7	12.4	27.1	42.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.375 in.	96.5		
#4	93.6		
#10	91.3		
#20	86.1		
#40	81.6		
#60	77.6		
#100	73.6		
#200	69.2		

* (no specification provided)

Soil Description

BROWN TO YELLOW/BROWN, DAMP, MEDIUM PLASTICIT, STIFF, SANDY (PHOSPHATE NODULES) SILT (ML), A-7-6(14).

Atterberg Limits

PL= 28 LL= 48 PI= 20

Coefficients

D_{85}= 0.717 D_{60}= 0.0222 D_{50}= 0.0102
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-7-6(14)

Remarks

BRYAN AVE., STA.9+08, 23.9' RT. C.L.
LAB #13900
F.M.=0.36

Sample No.: 13890 **Source of Sample:** BRYAN AVE. STA.9+08, 23.9' RT. C.L. **Date:** 8-22-02
Location: **Elev./Depth:** 2.2'-5.2'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 15

Date: 9-21-02

Project No.: 2095
Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Location: PHASE 5
Elev./Depth: 1.0'-6.5'
Remarks: CARLISLE AVE. STA.1+41.5, 9.3' RT. C.L.
LAB #13908

MATERIAL DESCRIPTION

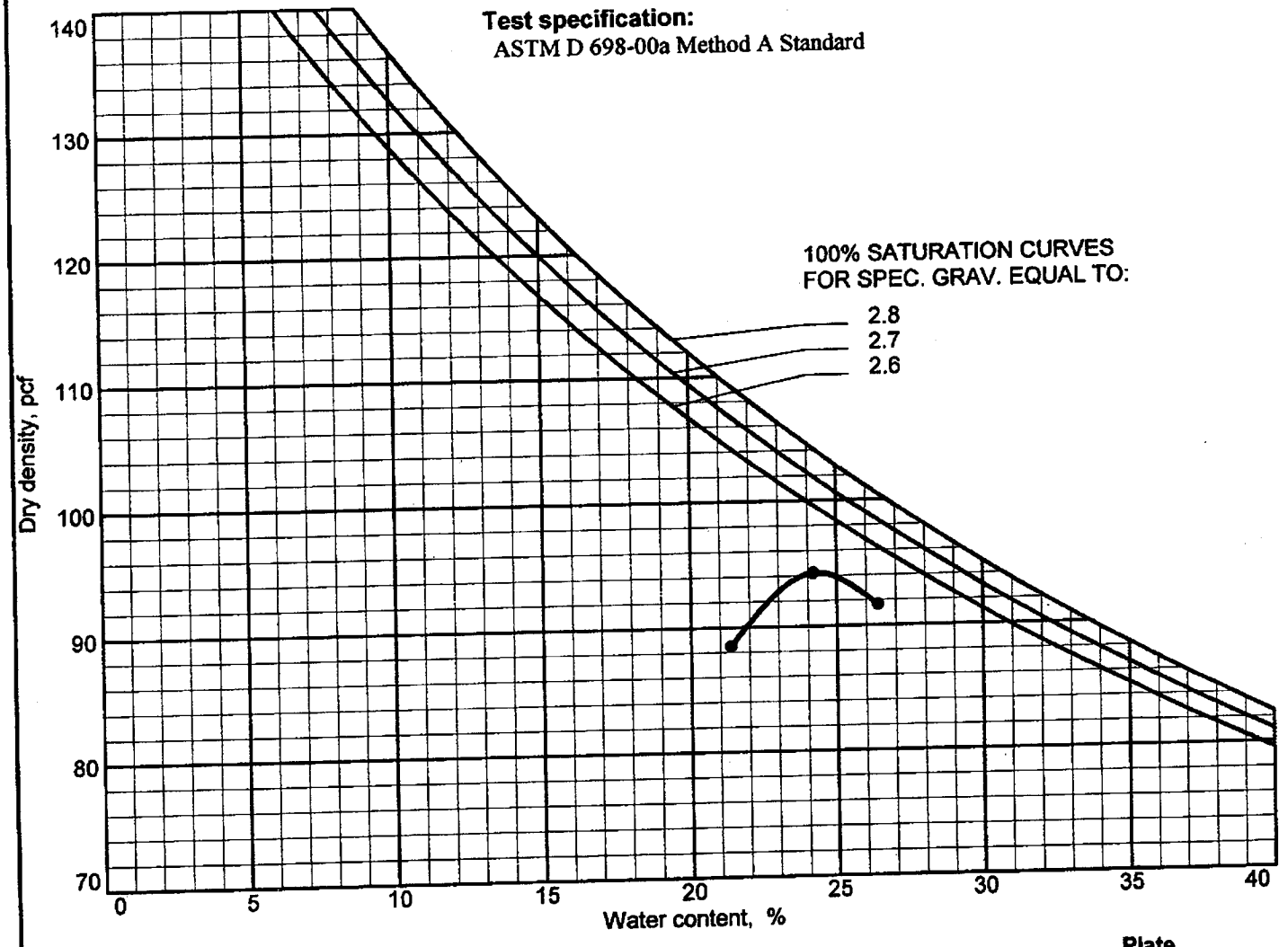
Description: LIGHT BROWN/TAN, GRAY MOTTLED, DAMP, VERY HIGH PLASTICITY, STIFF ELASTIC SILT (MH) WITH PHOSPHATE NODULES, A-7-5(40).

Classifications - **USCS:** MH **AASHTO:** A-7-5(40)

Nat. Moist. = 27.0 %
Liquid Limit = 71
% > No.4 = 0.0 %
Sp.G. = 2.72
Plasticity Index = 37
% < No.200 = 89.9 %

TEST RESULTS
Maximum dry density = 94 pcf
Optimum moisture = 24.5 %

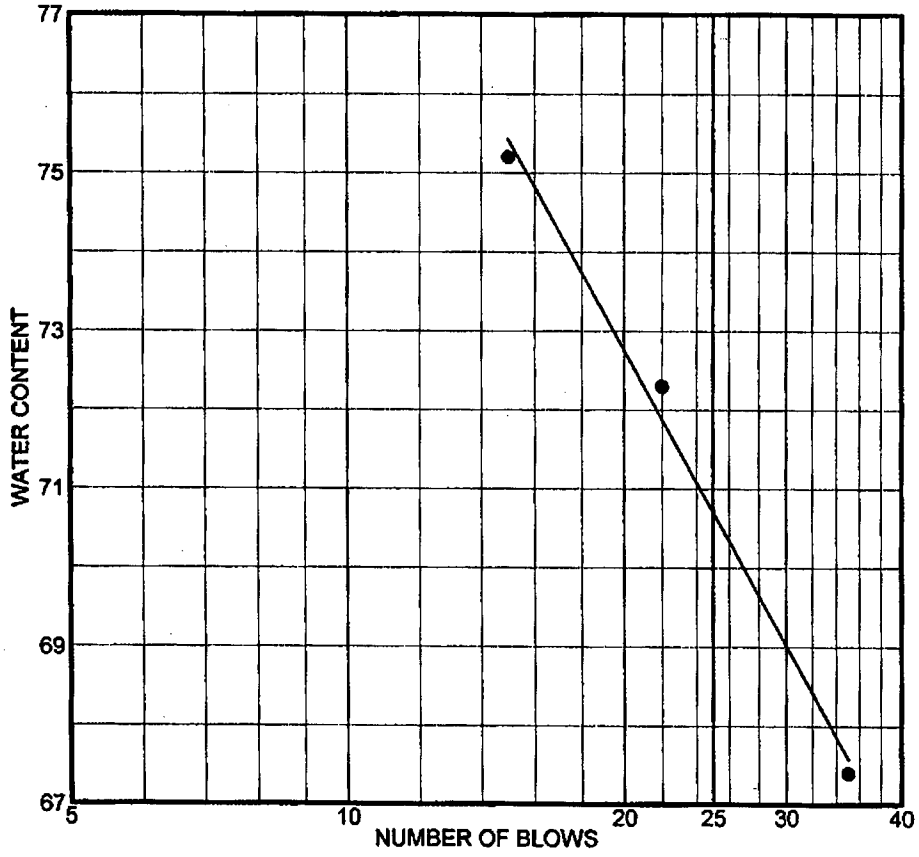
Test specification:
ASTM D 698-00a Method A Standard

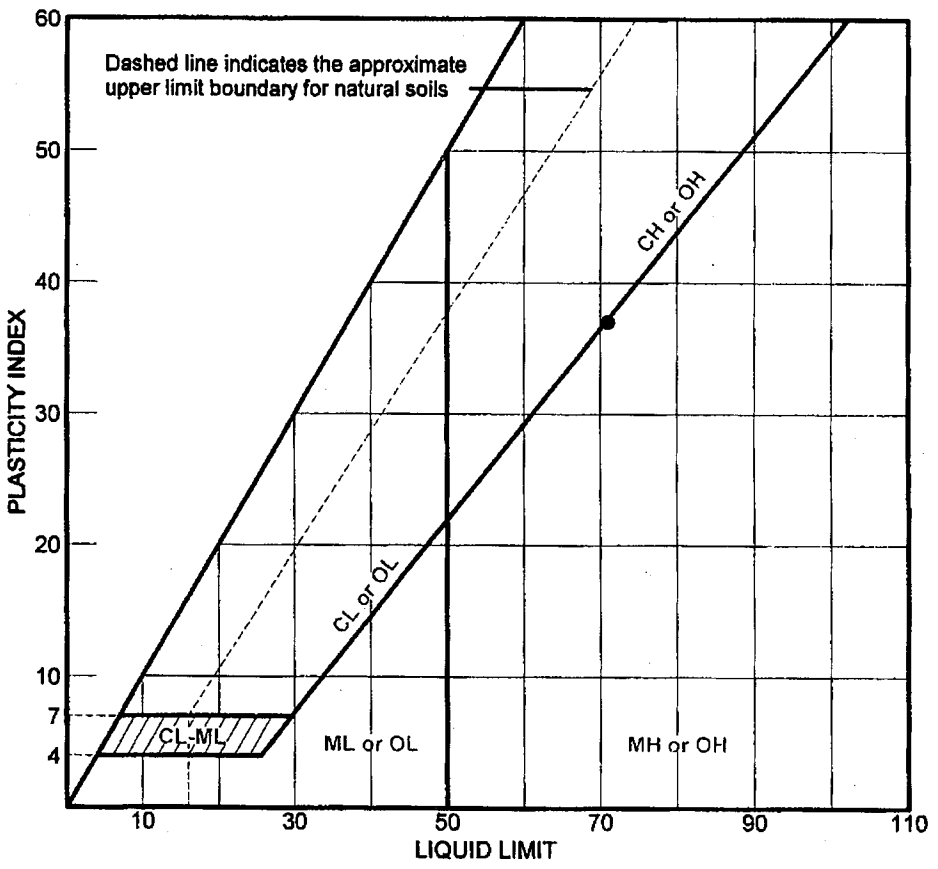


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	CARLISLE AVE.	13908	1.0'-6.5'	8-21-02	MH	LIGHT BROWN/TAN, GRAY MOTTLED, DAMP, VERY	27.0	71	37
	STA.1+41.5, 9.3' RT. C.L.					HIGH PLASTICITY, STIFF ELASTIC SILT (MH) WITH			
						PHOSPHATE NODULES, A-7-5(40).			

Client SHERMAN CARTER BARNHART, PSC

Project MEADOWS-NORTHLAND-ARLINGTON

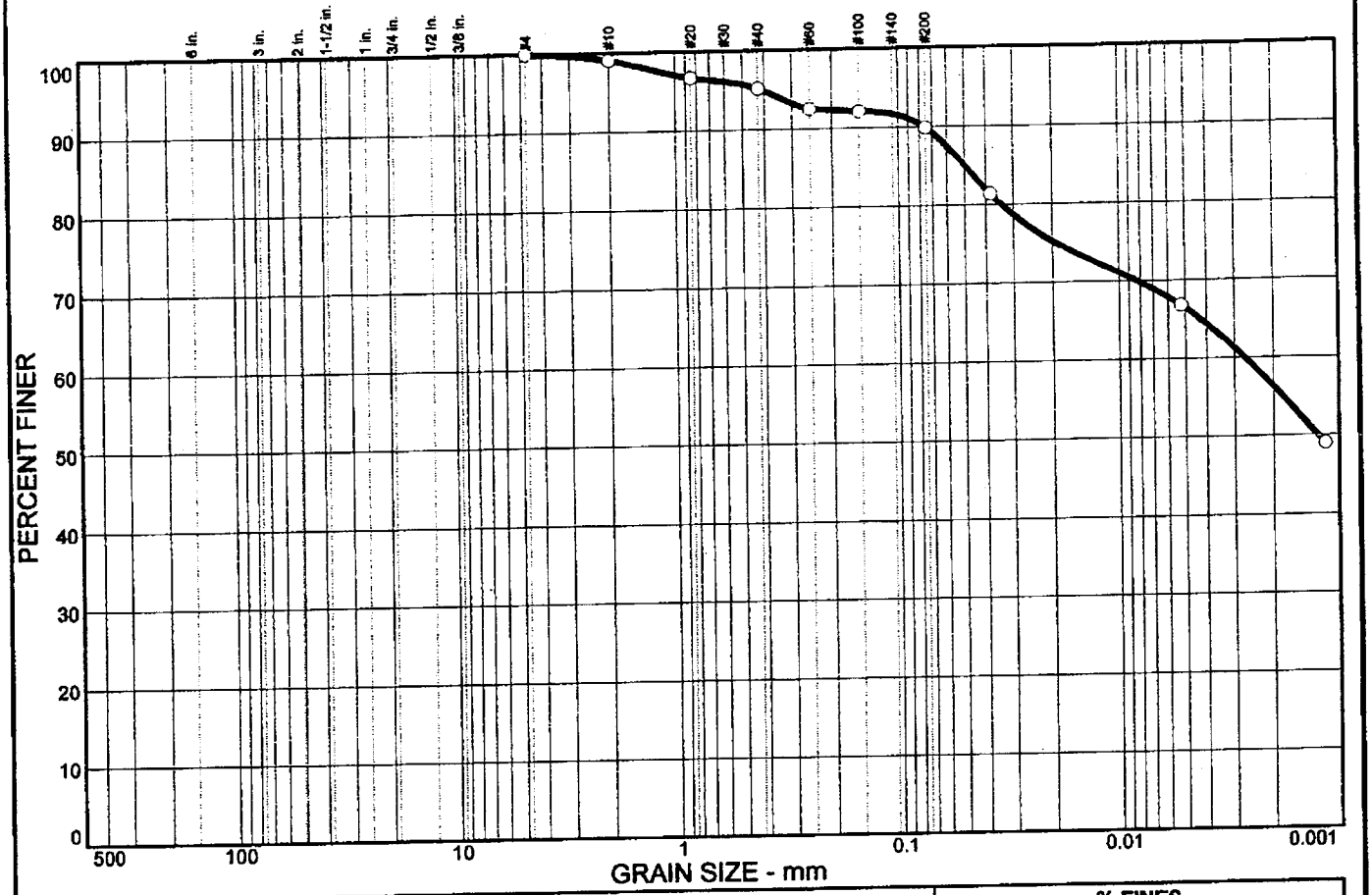
NEIGHBORHOOD IMPROVEMENT PROJECT

Project No. 2095 | Plate

GREGG LABORATORIES, INC.

● CARLISLE AVE. STA.1+41.5, 9.3' RT. C.L.
LAB #13908

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.9	3.9	5.3	23.5	66.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.1		
#20	96.7		
#40	95.2		
#60	92.5		
#100	92.1		
#200	89.9		

* (no specification provided)

Soil Description

LIGHT BROWN/TAN, GRAY MOTTLED, DAMP, VERY HIGH PLASTICITY, STIFF ELASTIC SILT (MH) WITH PHOSPHATE NODULES, A-7-5(40).

Atterberg Limits

PL= 34 LL= 71 PI= 37

Coefficients

D_{85}= 0.0497 D_{60}= 0.0027 D_{50}= 0.0012
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(40)

Remarks

CARLISLE AVE. STA.4+41.5, 9.3' RT. C.L.
LAB #13908
F.M.=0.08

Sample No.: 13908 **Source of Sample:** CARLISLE AVE. STA.1+41.5, 9.3' RT. C.L. **Date:** 8-21-02
Location: **Elev./Depth:** 1.0'-6.5'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 14

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.9'-3.9'

Remarks: CARLISLE AVE. STA.6+72.5, 9.4' RT. C.L.
LAB #13907

MATERIAL DESCRIPTION

Description: BROWN TO LIGHT BROWN, DAMP, MEDIUM PLASTICITY, MEDIUM LEAN CLAY (CL) WITH SAND (PHOSPHATE NODULES), A-7-6(14).

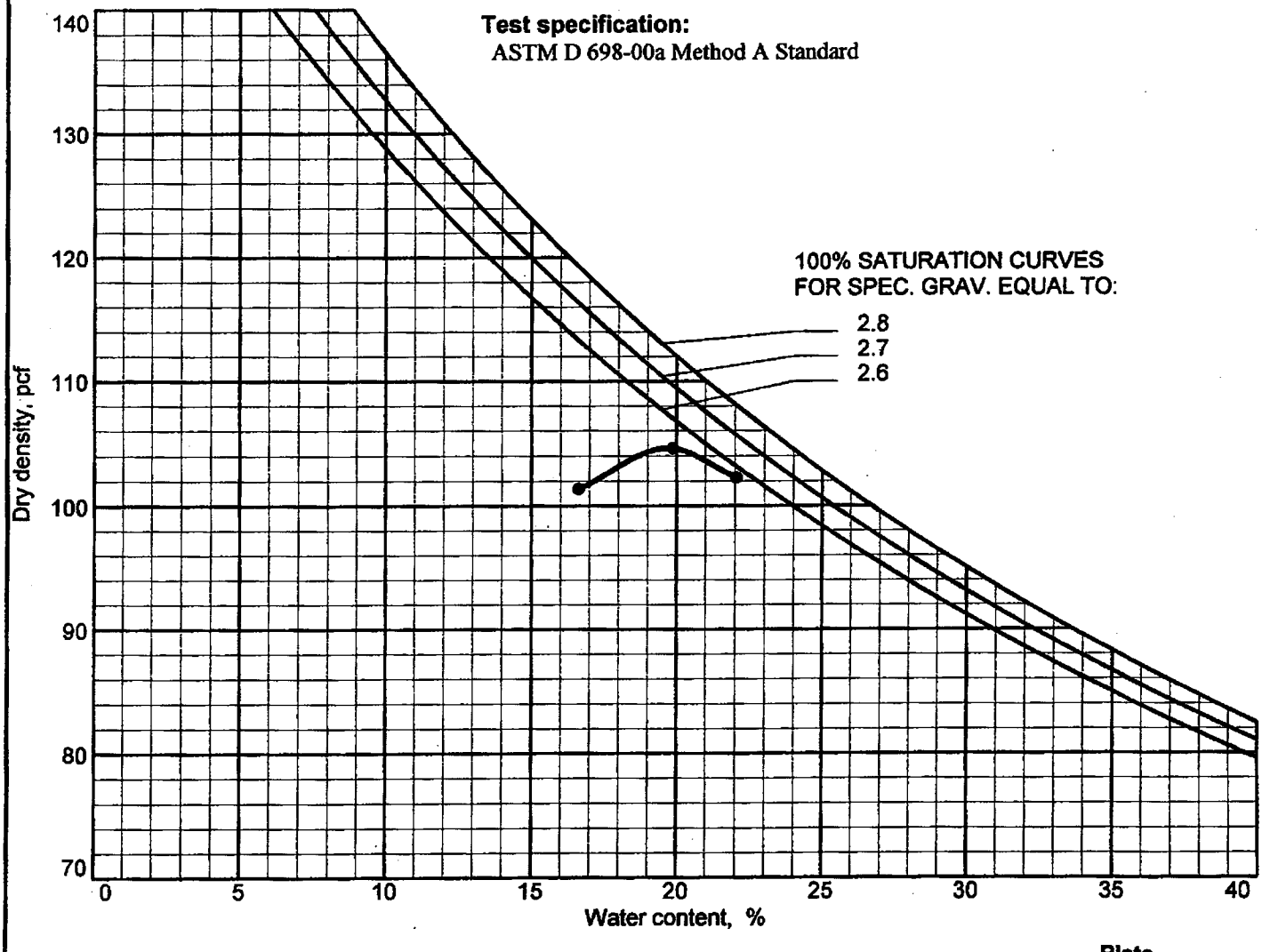
Classifications - **USCS:** CL **AASHTO:** A-7-6(14)

Nat. Moist. = 21.5 % **Sp.G. =** 2.71

Liquid Limit = 42 **Plasticity Index =** 18

% > No.4 = 0.5 % **% < No.200 =** 77.7 %

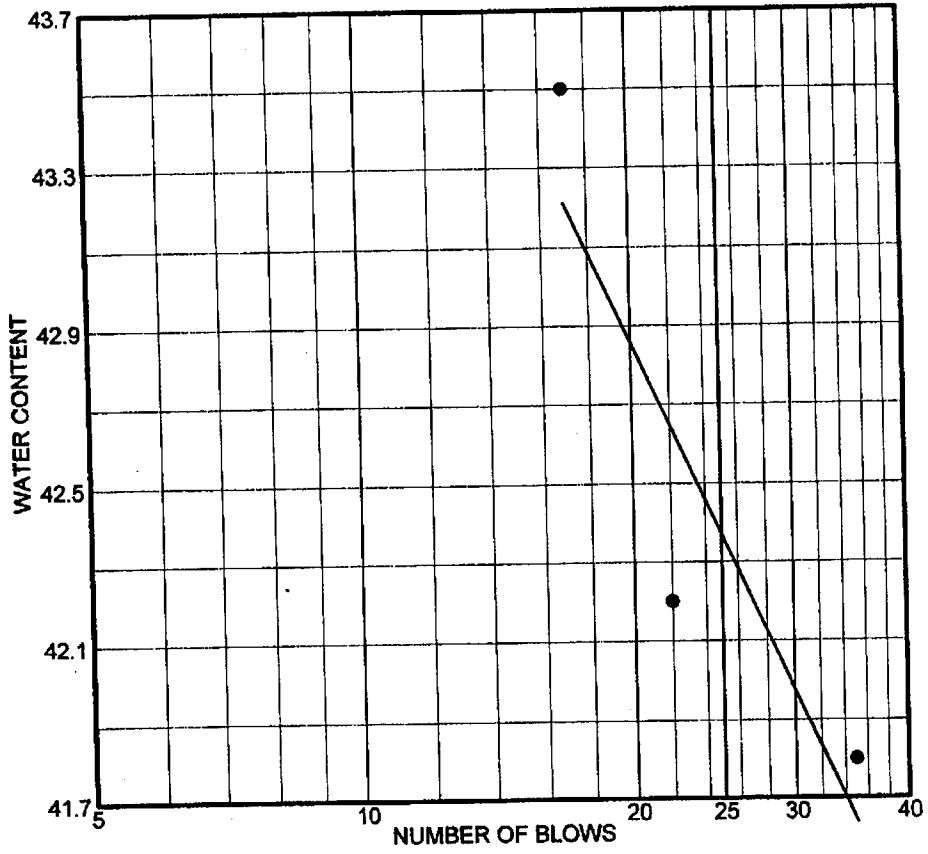
TEST RESULTS
Maximum dry density = 104.5 pcf
Optimum moisture = 19.5 %

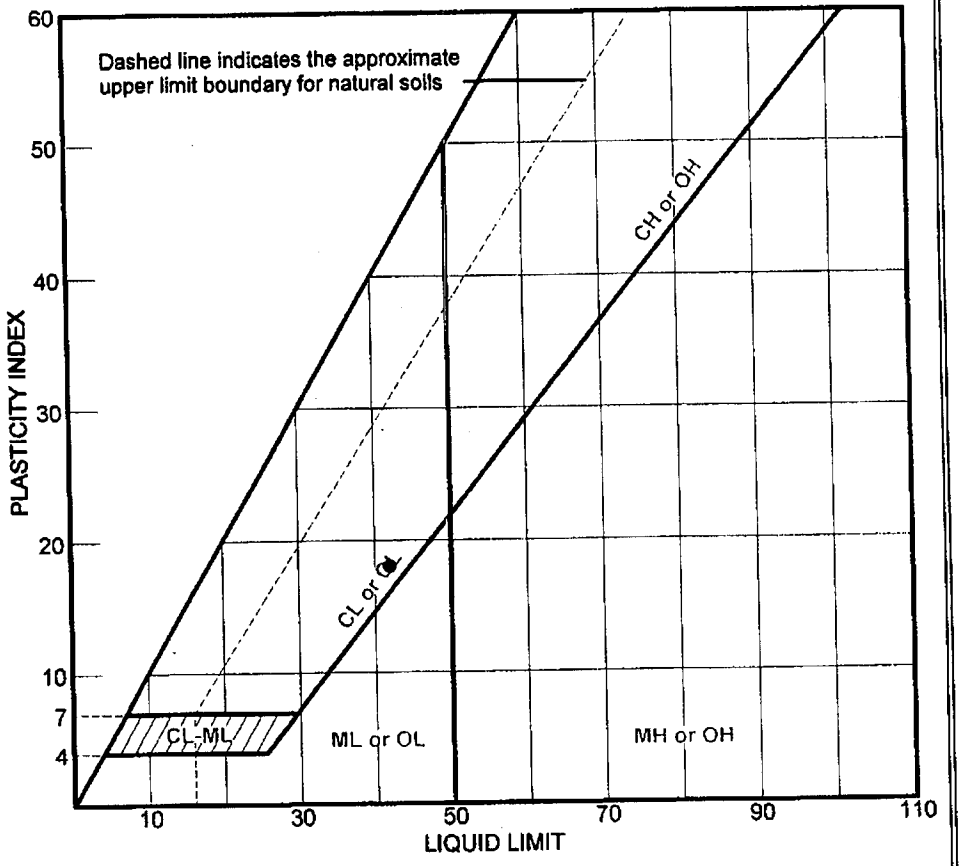


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





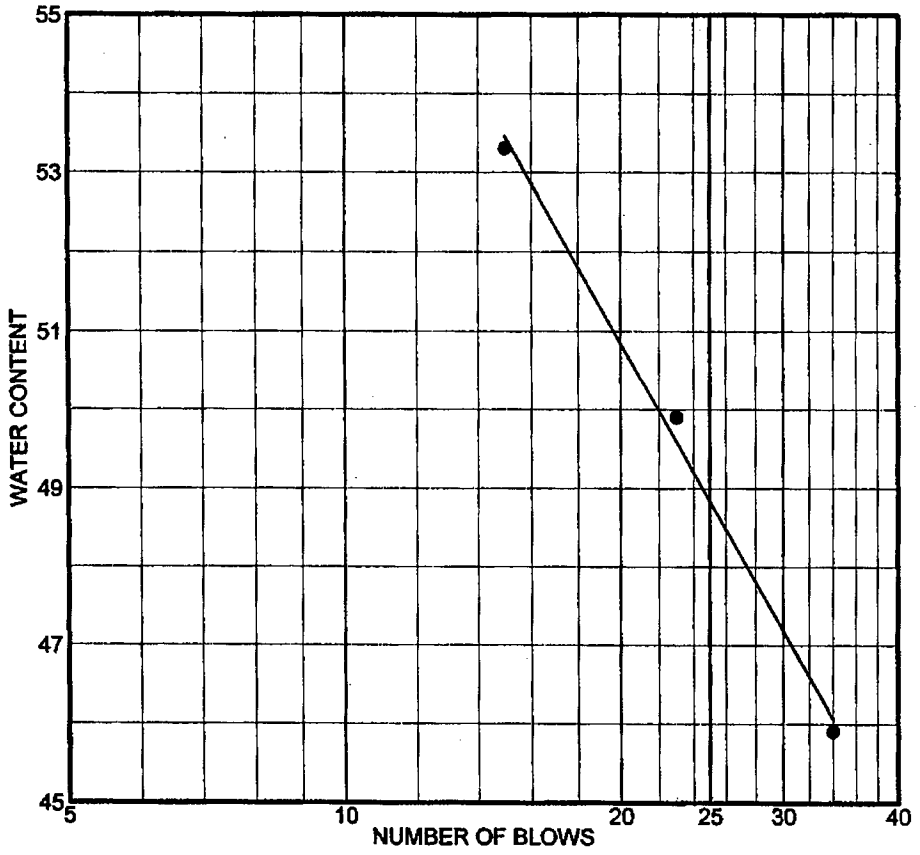
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	CARLISLE AVE.	13907	0.9'-3.9'	8-21-02	CL	BROWN TO LIGHT BROWN, DAMP, MEDIUM	21.5	42	18
	STA.6+72.5, 9.4' RT. C.L.					PLASTICITY, MEDIUM LEAN CLAY (CL) WITH SAND			
						(PHOSPHATE NODULES), A-7-6(14).			

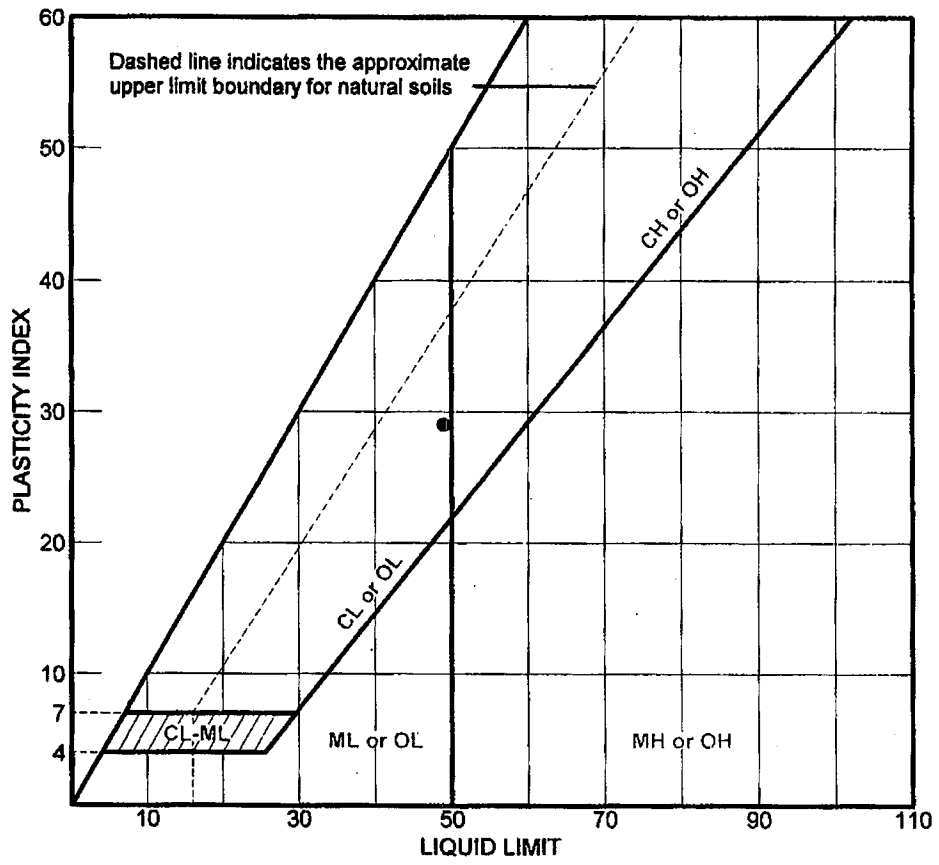
Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● CARLISLE AVE. STA.6+72.5, 9.4' RT. C.L.
LAB #13907

LIQUID AND PLASTIC LIMITS TEST REPORT





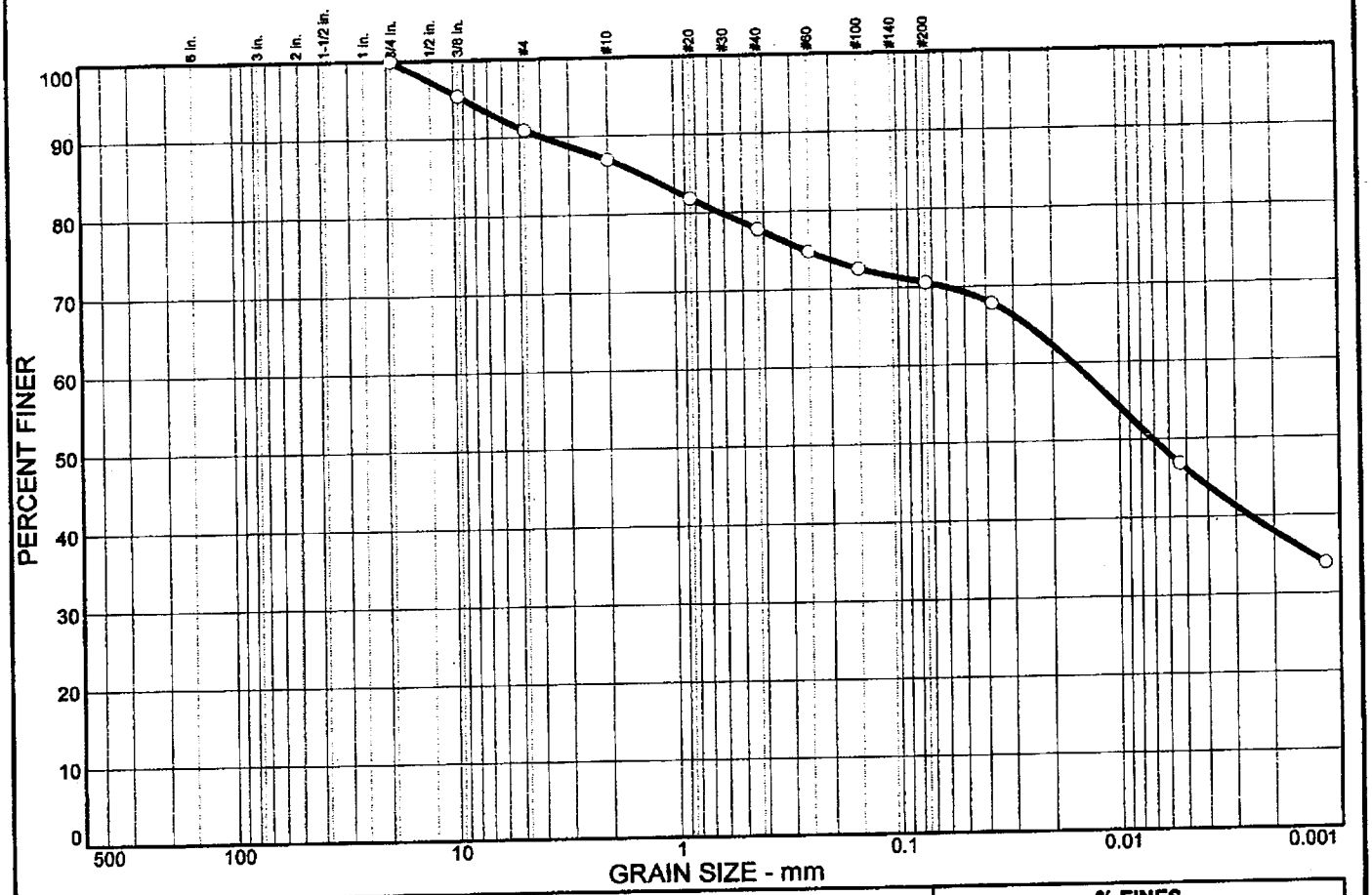
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	BRYAN AVE.,	13902	0.8'-3.0'	8-22-02	CL	LIGHT BROWN/GRAY/ORANGE BROWN, DAMP, HIGH	18.6	49	29
	STA.1+93, 19.4' RT. C.L.					PLASTICITY, STIFF LEAN CLAY (CL) WITH SAND			
						(CRUSHED AGGREGATE LIMESTONE), A-7-6(19).			

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 | Plate

GREGG LABORATORIES, INC.

● BRYAN AVE, STA.1+93 19.4' RT. C.L.
LAB #13902

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	9.1	3.9	9.2	7.2	24.4	46.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.375 in.	95.4		
#4	90.9		
#10	87.0		
#20	81.9		
#40	77.8		
#60	74.8		
#100	72.5		
#200	70.6		

* (no specification provided)

Soil Description

LIGHT BROWN/GRAY/ORANGE BROWN, DAMP, HIGH PLASTICITY, STIFF LEAN CLAY (CL) WITH SAND (CRUSHED AGGREGATE LIMESTONE), A-7-6(19).

Atterberg Limits

PL= 20 LL= 49 PI= 29

Coefficients

D_{85}= 1.40 D_{60}= 0.0162 D_{50}= 0.0070
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(19)

Remarks

BRYAN AVE. STA.1+93, 19.4' RT. C.L.
LAB #13902
F.M.=0.41

Sample No.: 13902 **Source of Sample:** BRYAN AVE., STA.1+93, 19.4' RT. C.L. **Date:** 8-22-02
Location: **Elev./Depth:** 0.8'-3.0'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 8

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.5'-2.0'

Remarks: BRYAN AVE. STA.5+77, 19.7' RT. C.L.
LAB #13901

MATERIAL DESCRIPTION

Description: LIGHT YELLOWISH BROWN, DAMP, MEDIUM PLASTICITY, STIFF CLAYEY GRAVEL WITH SAND (GC), A-6(1).

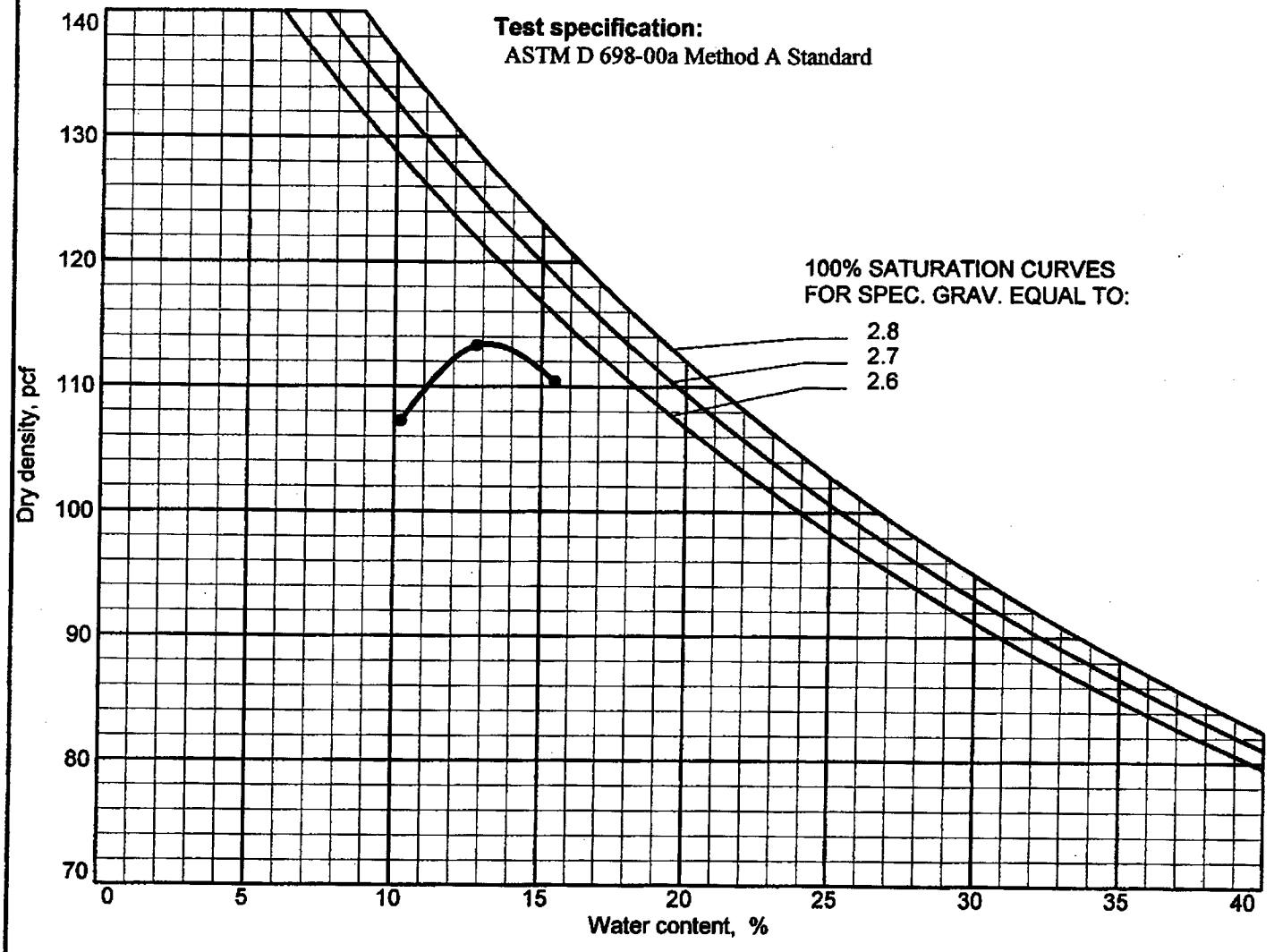
Classifications - **USCS:** GC **AASHTO:** A-6(1)

Nat. Moist. = 8.6 % **Sp.G. =** 2.71

Liquid Limit = 34 **Plasticity Index =** 13

% > No.4 = 47.2 % **% < No.200 =** 35.7 %

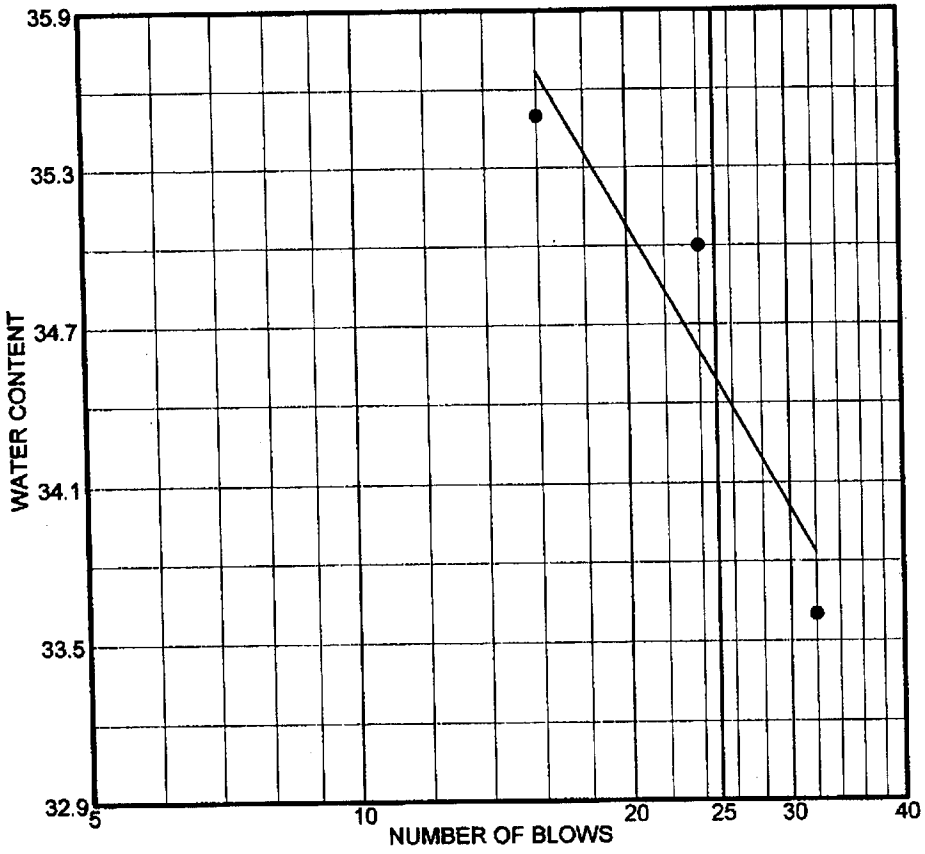
TEST RESULTS
Maximum dry density = 113.5 pcf
Optimum moisture = 13 %

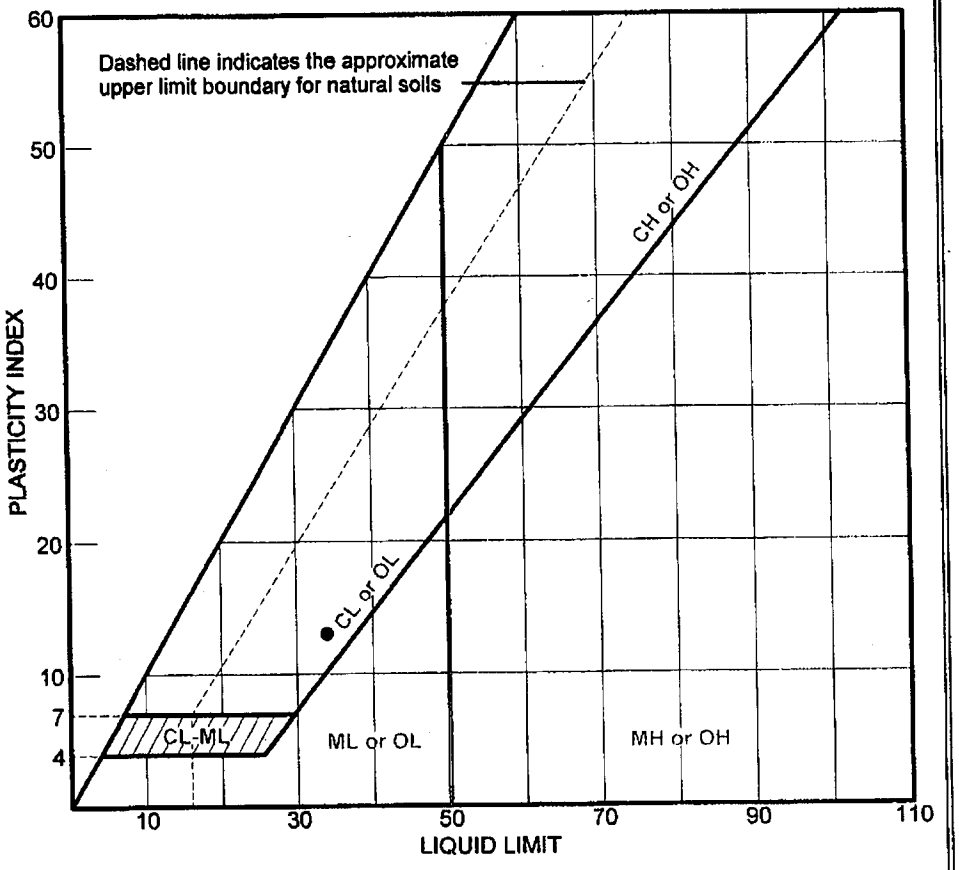


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





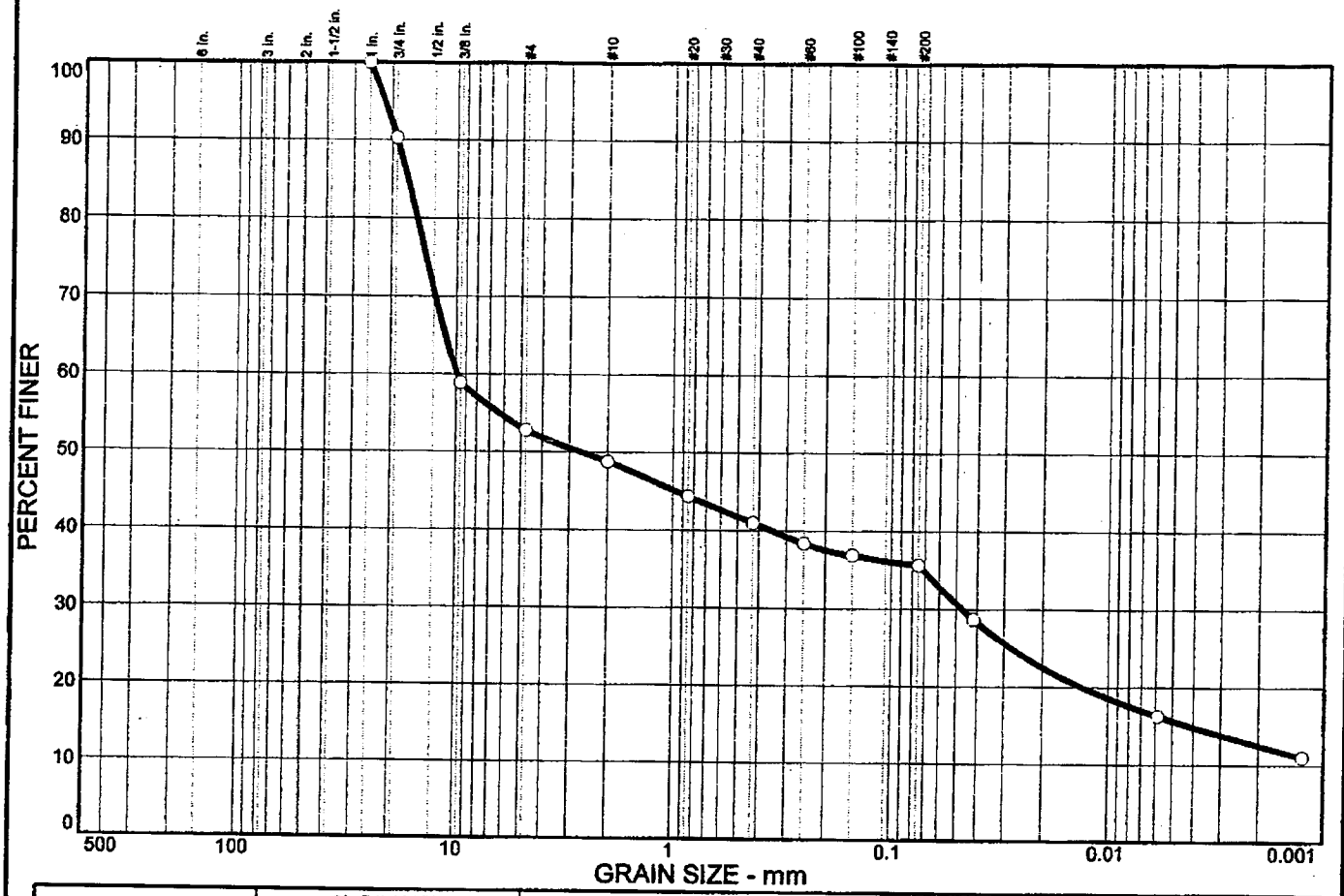
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	BRYAN AVE.,	13901	0.5'-2.0'	8-22-02	GC	LIGHT YELLOWISH BROWN, DAMP, MEDIUM	8.6	34	13
	STA.5+77, 19.7' RT. C.L.					PLASTICITY, STIFF CLAYEY GRAVEL WITH SAND (GC),			
						A-6(1).			

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● BRYAN AVE., STA.5+77, 19.7' RT. C.L.
LAB #13901

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	9.7	37.5	4.0	7.8	5.3	20.0	15.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	90.3		
.375 in.	58.9		
#4	52.8		
#10	48.8		
#20	44.4		
#40	41.0		
#60	38.4		
#100	36.9		
#200	35.7		

* (no specification provided)

Soil Description

LIGHT YELLOWISH BROWN, DAMP, MEDIUM PLASTICITY, STIFF CLAYEY GRAVEL WITH SAND (GC), A-6(1).

Atterberg Limits

PL= 21 LL= 34 PI= 13

Coefficients

D_{85}= 16.9 D_{60}= 9.86 D_{50}= 2.63
D_{30}= 0.0466 D_{15}= 0.0041 D_{10}=
C_u= C_c=

Classification

USCS= GC AASHTO= A-6(1)

Remarks

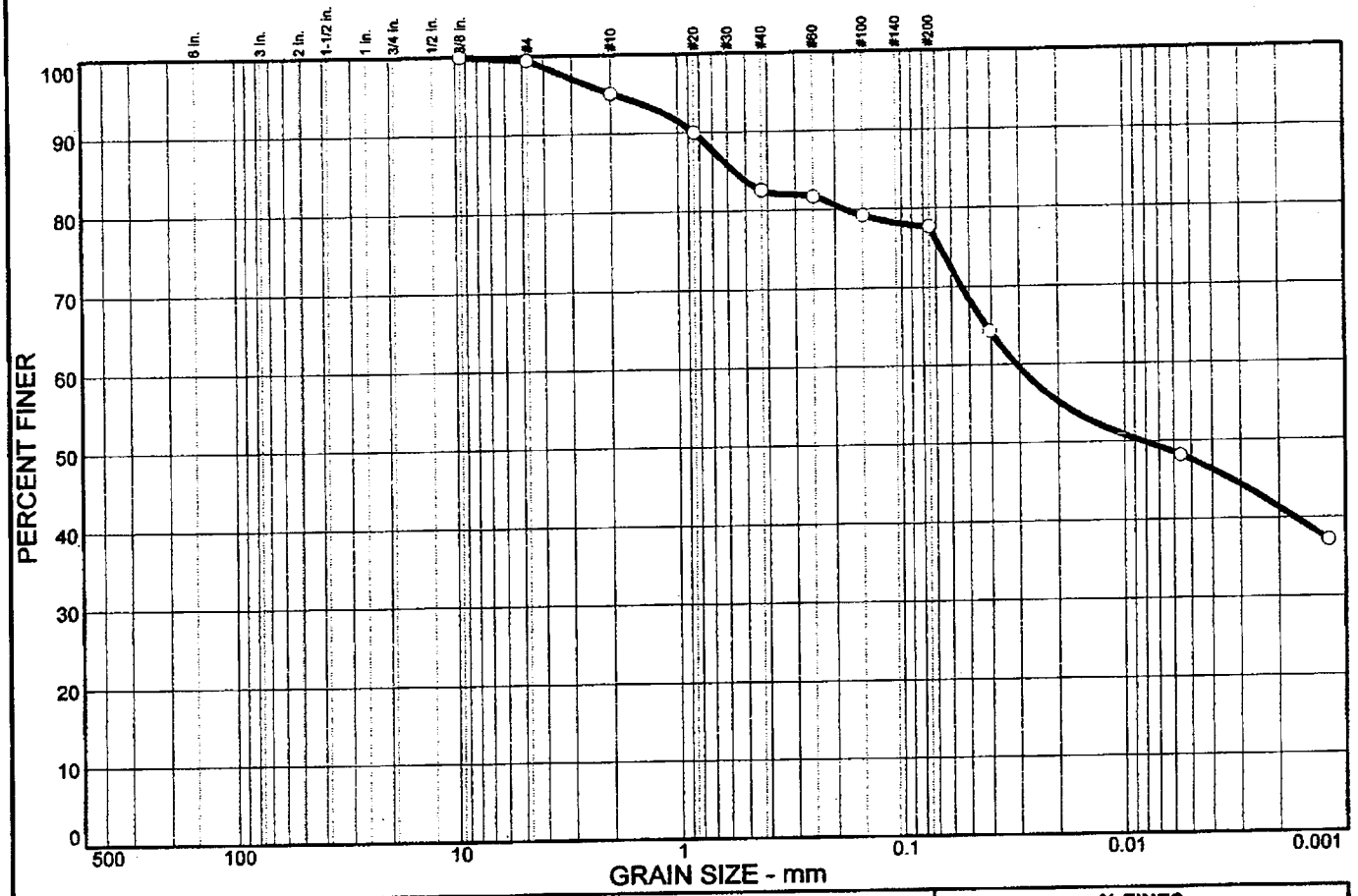
BRYAN AVE, STA.5+77, 19.7' RT. C.L.
LAB #13901
F.M.=1.61

Sample No.: 13901 **Source of Sample:** BRYAN AVE., STA.5+77, 19.7' RT. C.L. **Date:** 8-22-02
Location: **Elev./Depth:** 0.5'-2.0'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.5	4.4	12.5	4.9	30.1	47.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.5		
#10	95.1		
#20	90.0		
#40	82.6		
#60	81.7		
#100	79.2		
#200	77.7		

* (no specification provided)

Soil Description

BROWN TO LIGHT BROWN, DAMP, MEDIUM PLASTICITY, MEDIUM LEAN CLAY (CL) WITH SAND (PHOSPHATE NODULES), A-7-6(14).

Atterberg Limits

PL= 24 LL= 42 PI= 18

Coefficients

D_{85}= 0.559 D_{60}= 0.0309 D_{50}= 0.0082
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(14)

Remarks

CARLISLE AVE. STA.6+72.5, 9.4' RT. C.L.
LAB #13907
F.M.=0.21

Sample No.: 13907 **Source of Sample:** CARLISLE AVE. STA.6+72.5, 9.4' RT. C.L. **Date:** 8-21-02
Location: **Elev./Depth:** 0.9'-3.9'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 13

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 1.2'-5.5'.

Remarks: CARLISLE AVE. STA.11+73.2, 9.5' LT. C.L.
LAB #13906

MATERIAL DESCRIPTION

Description: LIGHT BROWN, GRAY MOTTLED, DAMP, HIGH PLASTICITY, STIFF, SANDY (WEATHERED CHERT FRAGMENTS) ELASTIC SILT (MH), A-7-5(18).

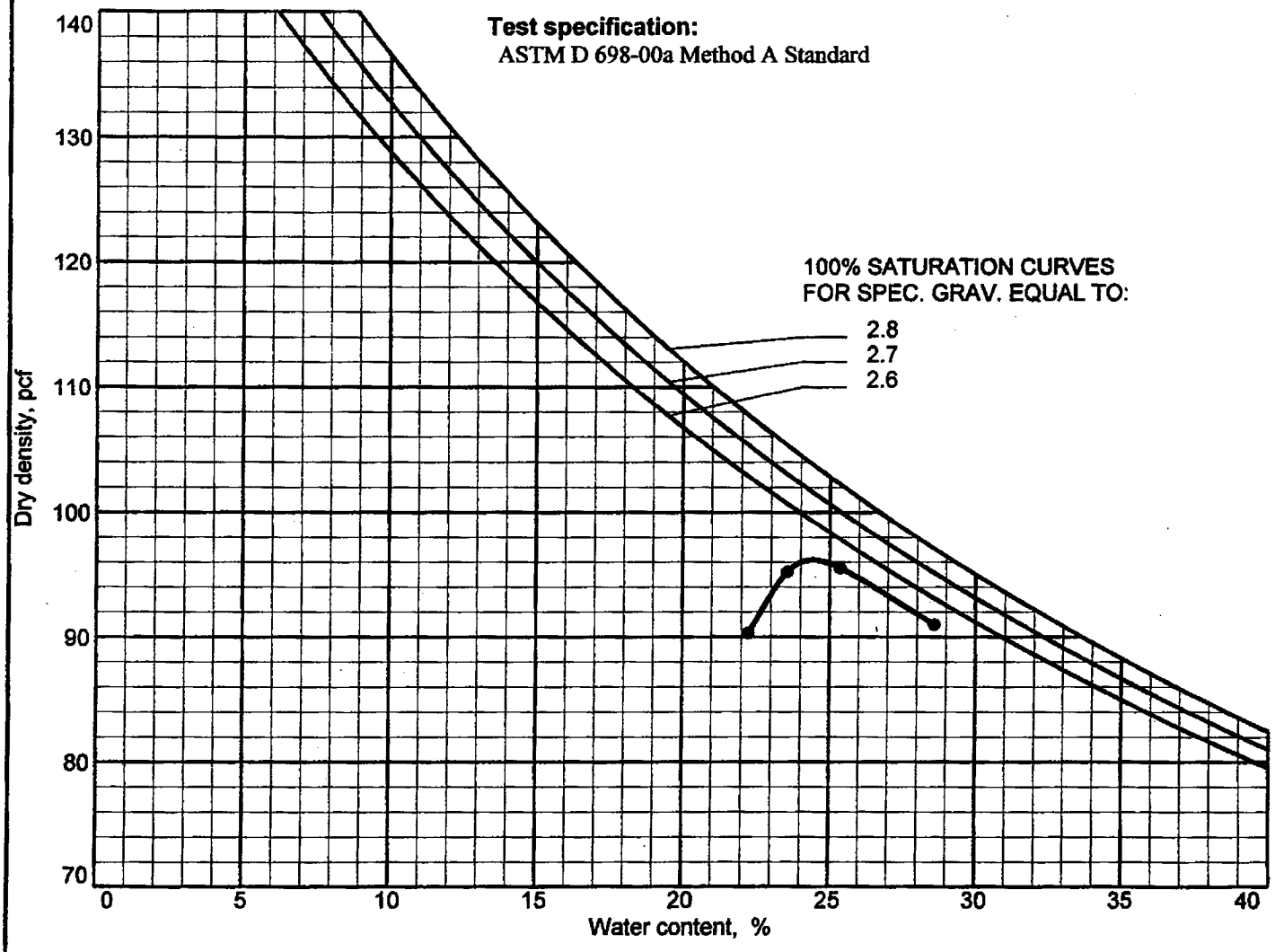
Classifications - **USCS:** MH **AASHTO:** A-7-5(18)

Nat. Moist. = 26.8 % **Sp.G. =** 2.78

Liquid Limit = 59 **Plasticity Index =** 26

% > No.4 = 0.6 % **% < No.200 =** 67.4 %

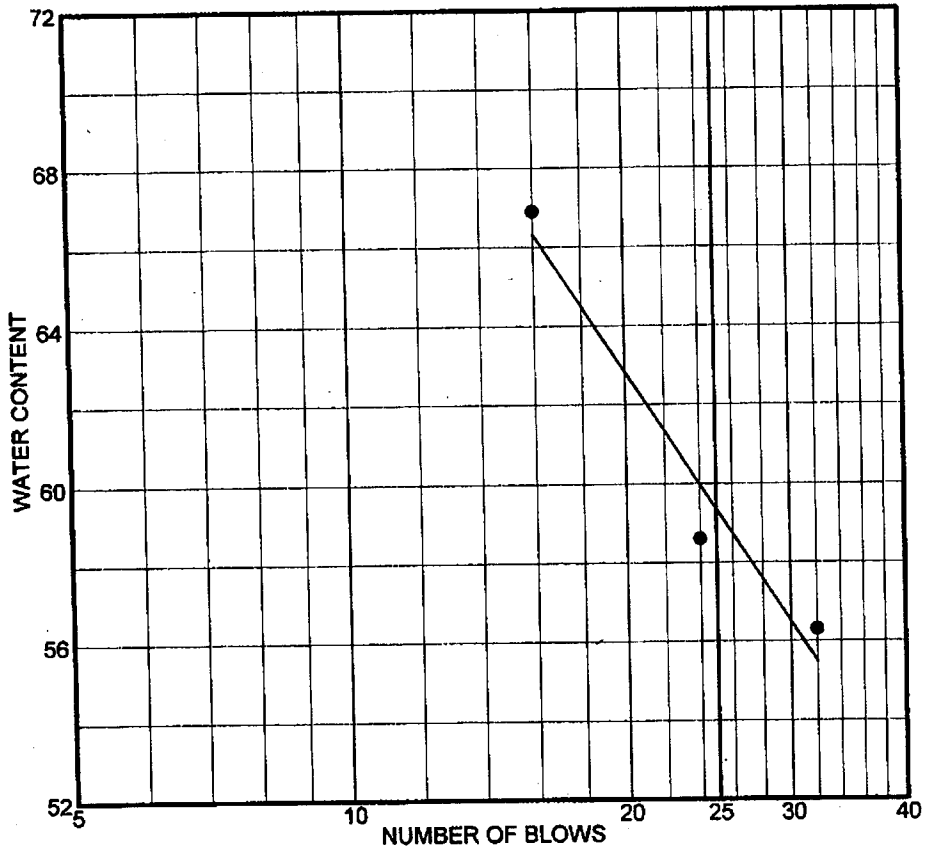
TEST RESULTS
Maximum dry density = 96 pcf
Optimum moisture = 24.5 %

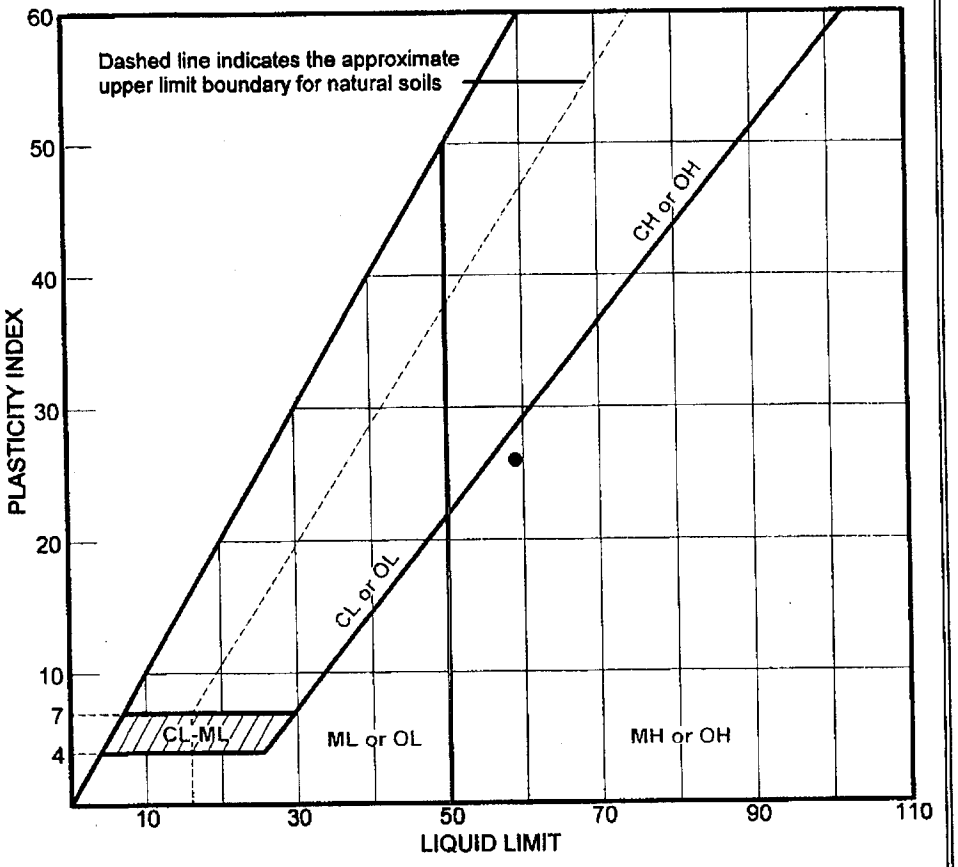


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





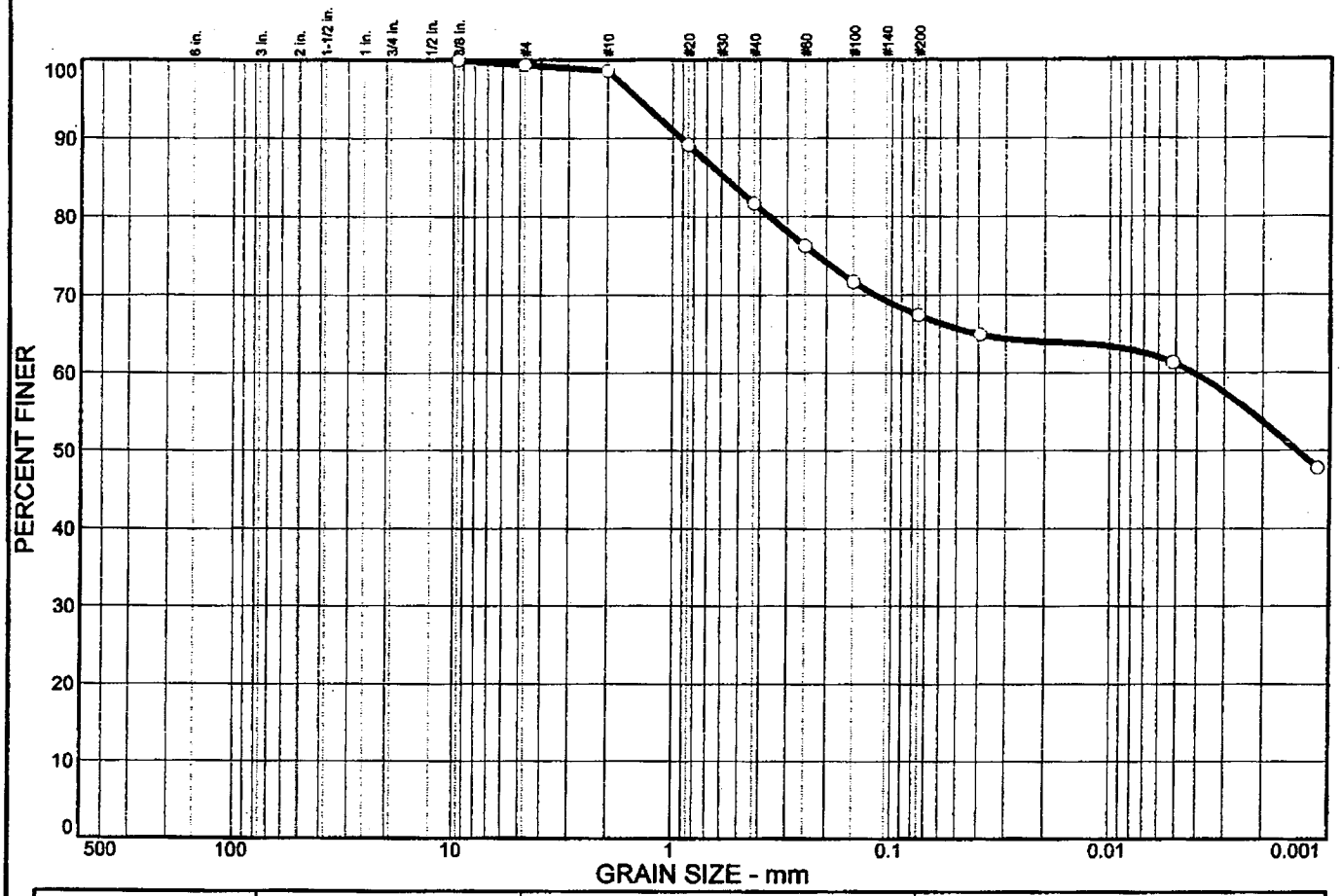
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	CARLISLE AVE. STA.11+73.2, 9.5' LT. C.L.	13906	1.2'-5.5'.	8-21-02	MH	LIGHT BROWN, GRAY MOTTLED, DAMP, HIGH PLASTICITY, STIFF, SANDY (WEATHERED CHERT FRAGMENTS) ELASTIC SILT (MH), A-7-5(18).	26.8	59	26

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● CARLISLE AVE. STA.11+73.2, 9.5' LT. C.L.
LAB #13906

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.6	0.8	16.9	14.3	6.3	61.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.4		
#10	98.6		
#20	89.2		
#40	81.7		
#60	76.3		
#100	71.7		
#200	67.4		

* (no specification provided)

Soil Description

LIGHT BROWN, GRAY MOTTLED, DAMP, HIGH PLASTICITY, STIFF, SANDY (WEATHERED CHERT FRAGMENTS) ELASTIC SILT (MH), A-7-5(18).

Atterberg Limits

PL= 33 LL= 59 PI= 26

Coefficients

D_{85}= 0.579 D_{60}= 0.0041 D_{50}= 0.0014
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(18)

Remarks

CARLISLE AVE. STA.11+73.2, 9.5' LT. C.L.
LAB #13906
F.M.=0.29

Sample No.: 13906 **Source of Sample:** CARLISLE AVE. STA.11+73.2, 9.5' LT. C.L **Date:** 8-21-02
Location: **Elev./Depth:** 1.2'-5.5'.

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 6

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 1.1'-3.5'

Remarks: LOCUST AVE., STA.1+34, 10.2' RT. C.L.
LAB #13888

MATERIAL DESCRIPTION

Description: BROWN TO ORANGE/BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-5(43).

Classifications - **USCS:** CH **AASHTO:** A-7-5(43)

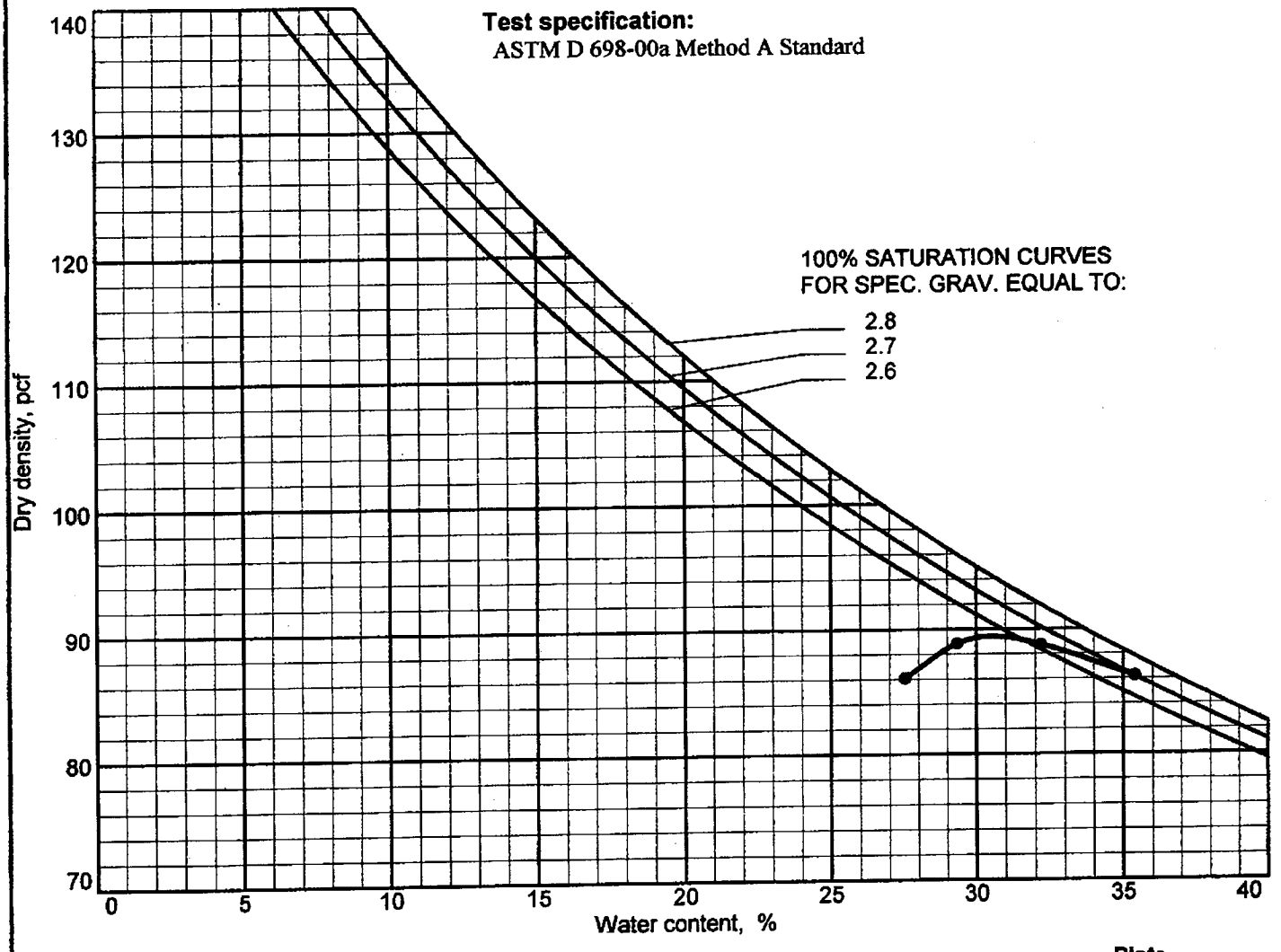
Nat. Moist. = 35.1 % **Sp.G. =** 2.78

Liquid Limit = 80 **Plasticity Index =** 48

% > No.4 = 0.0 % **% < No.200 =** 79.6 %

TEST RESULTS
Maximum dry density = 89.5 pcf
Optimum moisture = 30.5 %

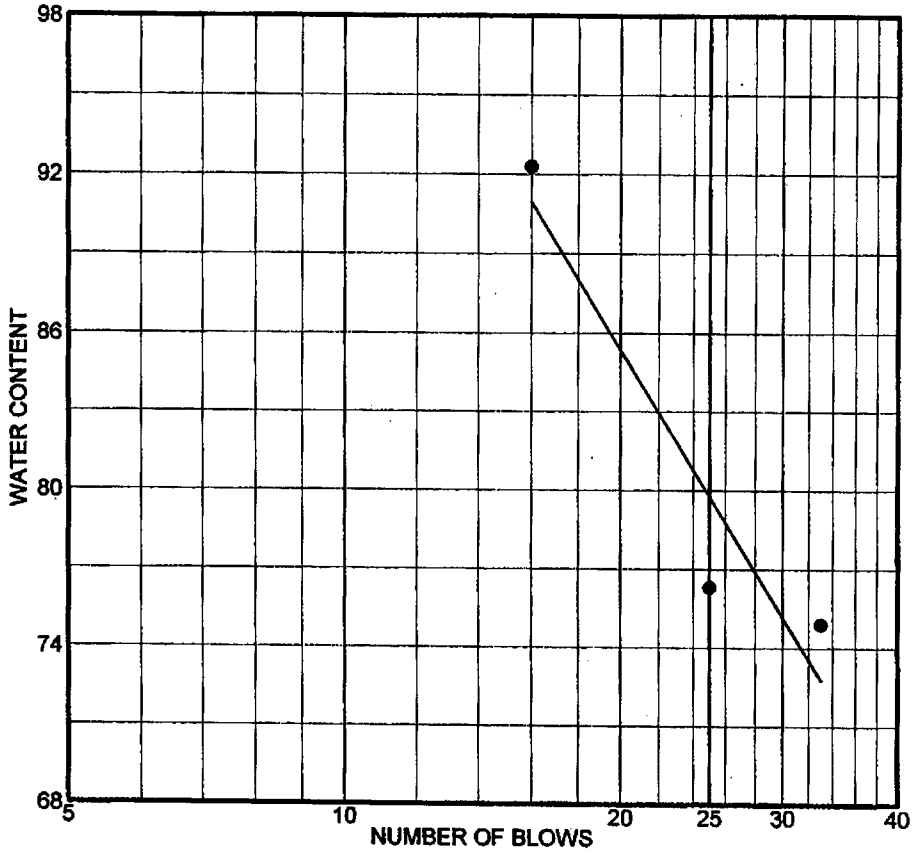
Test specification:
ASTM D 698-00a Method A Standard

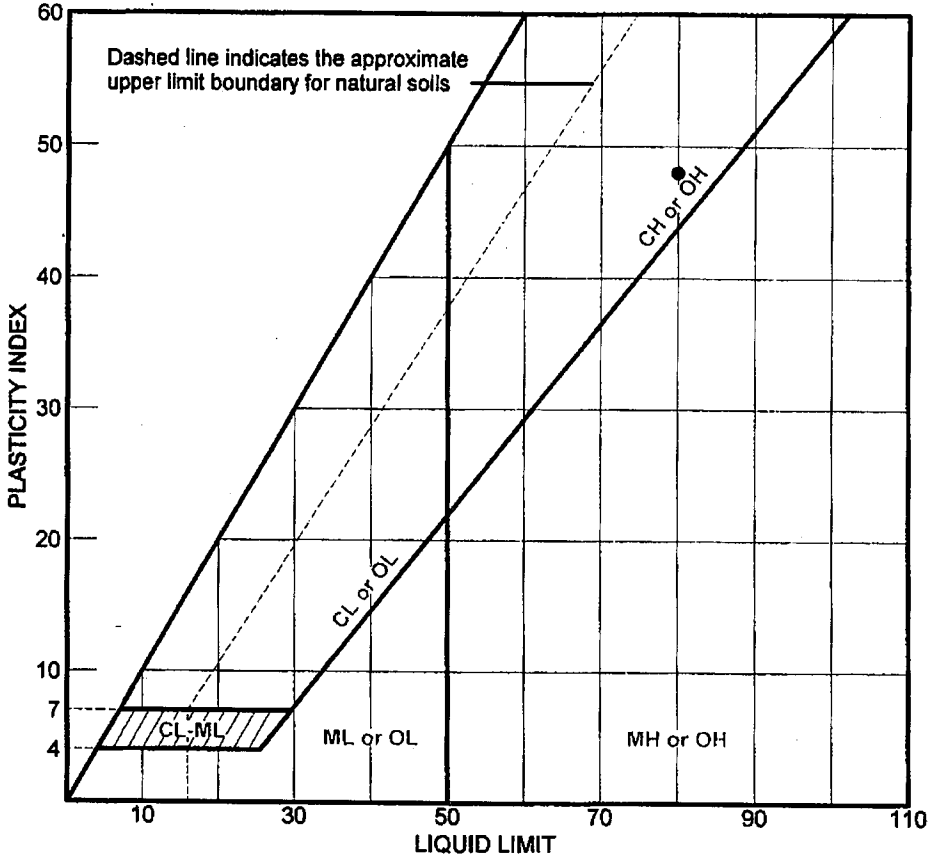


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





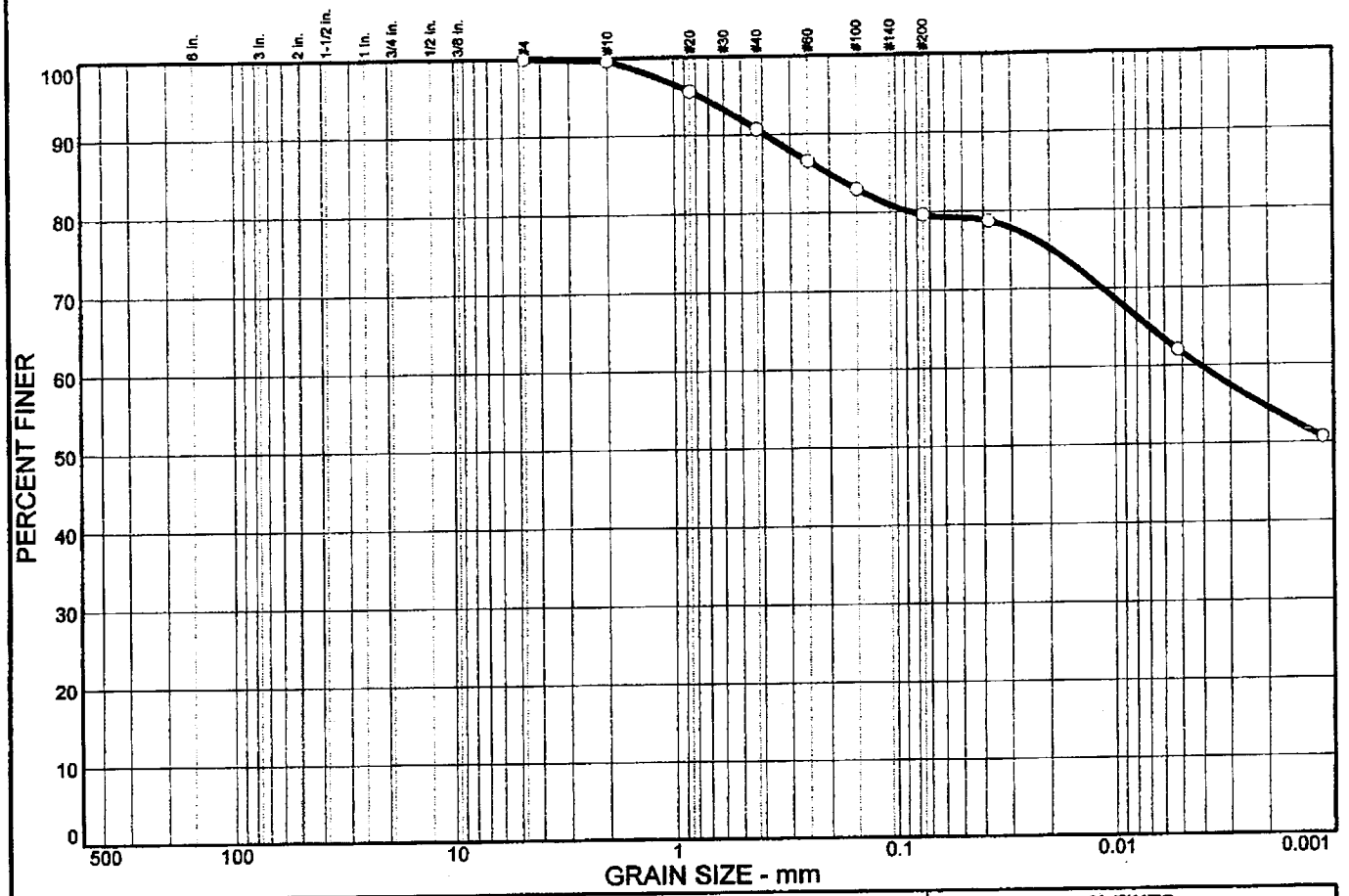
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	LOCUST AVE, STA.1+34, 10.2' RT. C.L.	13888	1.1'-3.5'	8-20-02	CH	BROWN TO ORANGE/BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-5(43).	35.1	80	48

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● LOCUST AVE. STA.1+34, 10.2' RT. CL.L.
LAB #13888

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.3	9.0	11.1	17.9	61.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.7		
#20	95.6		
#40	90.7		
#60	86.6		
#100	83.0		
#200	79.6		

* (no specification provided)

Soil Description

BROWN TO ORANGE/BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-5(43).

Atterberg Limits

PL= 32 LL= 80 PI= 48

Coefficients

D_{85}= 0.201 D_{60}= 0.0041 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(43)

Remarks

LOCUST AVE., SAT.1+34, 10.2' RT. C.L.
LAB #13888
F.M.=0.17

Sample No.: 13888 **Source of Sample:** LOCUST AVE, STA.1+34, 10.2' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 1.1'-3.5'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 5

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 1.1'-5.9'

Remarks: LOCUST AVE., STA.6+16.7, 9.4' RT. C.L. LAB #13887

MATERIAL DESCRIPTION

Description: BROWN/TAN, GRAY MOTTLED, DAMP, HIGH PLASTICITY, STIFF, SANDY (WEATHERED CHERT FRAGMENTS) ELASTIC SILT (MH), A-7-5(12).

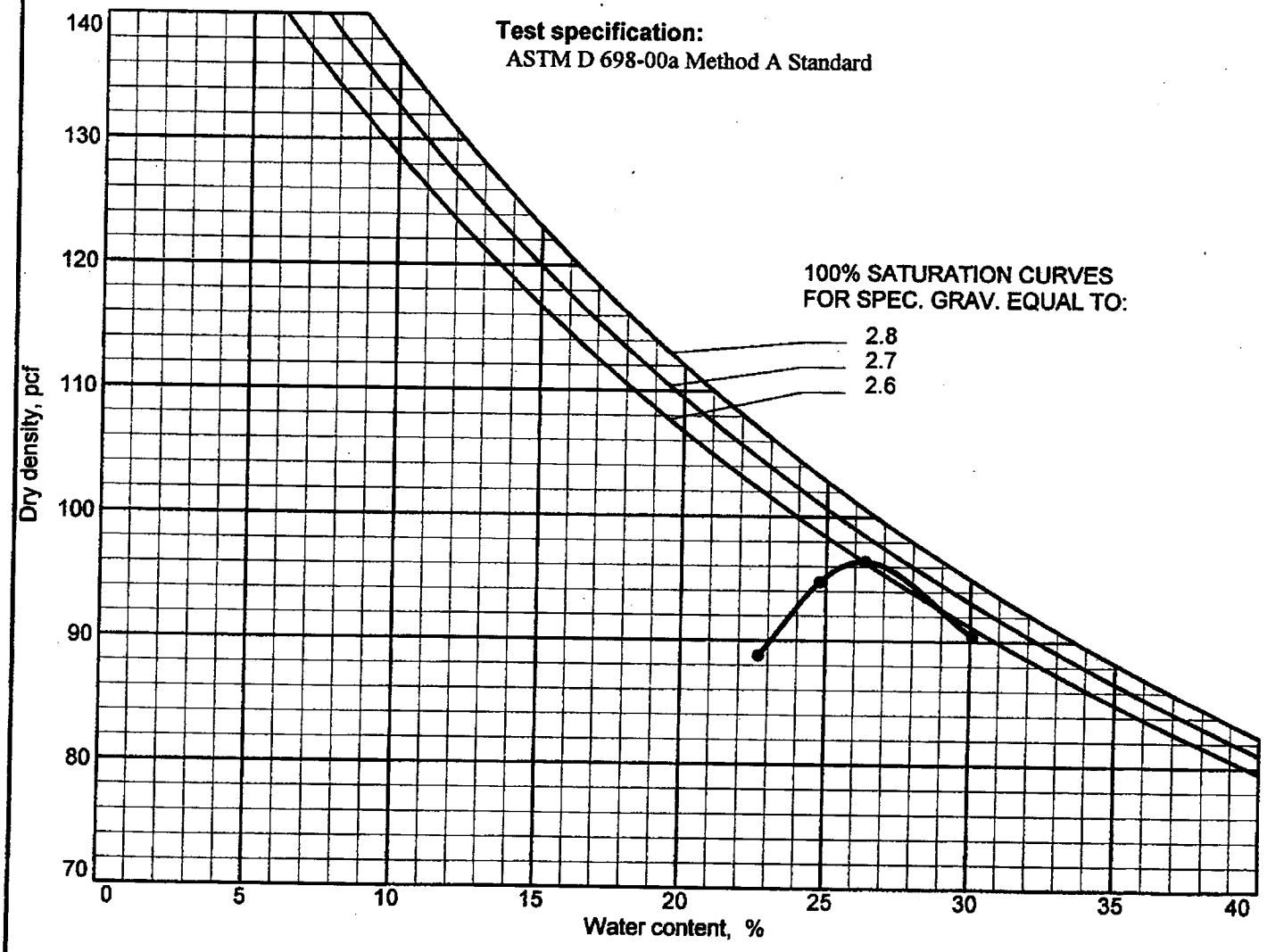
Classifications - **USCS:** MH **AASHTO:** A-7-5(12)

Nat. Moist. = 25.7 % **Sp.G. =** 2.73

Liquid Limit = 54 **Plasticity Index =** 23

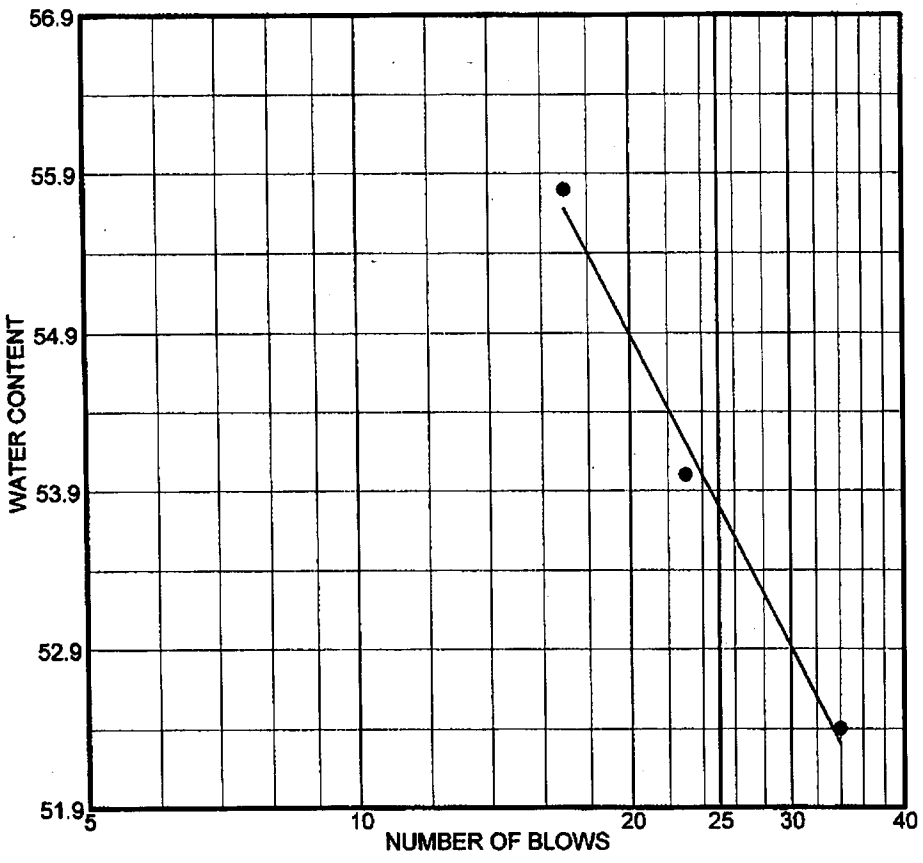
% > No.4 = 0.9 % **% < No.200 =** 57.5 %

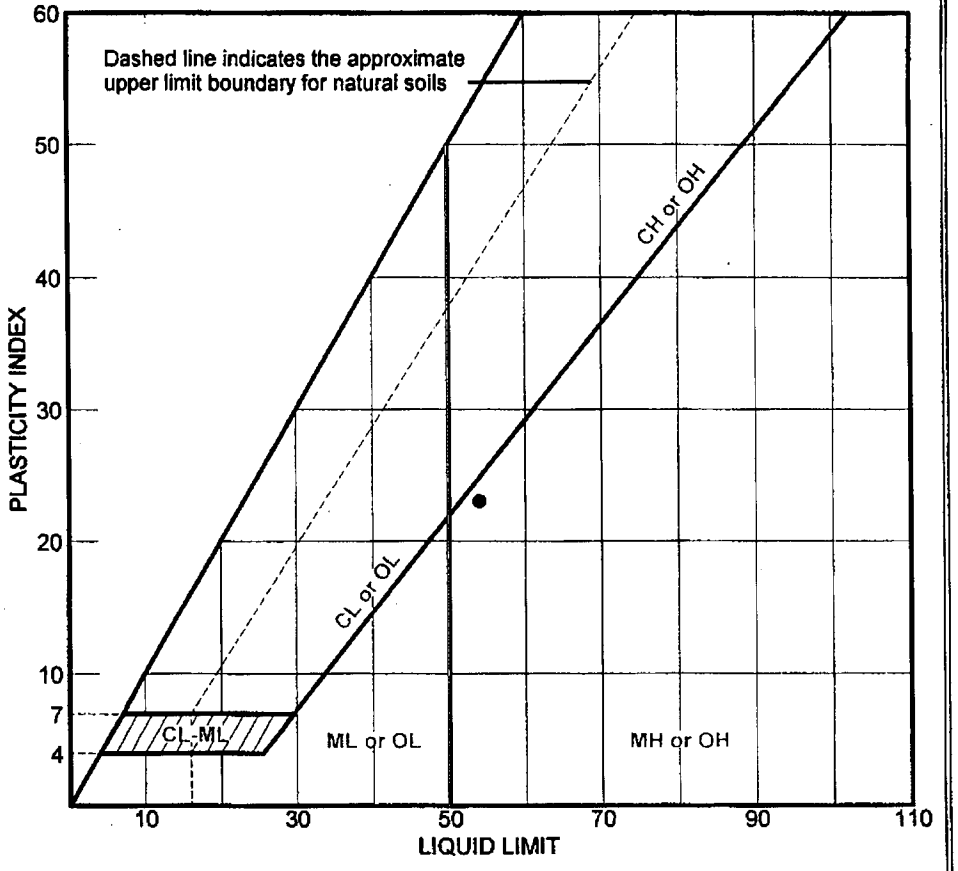
TEST RESULTS
Maximum dry density = 96.5 pcf
Optimum moisture = 26.5 %



Plate

LIQUID AND PLASTIC LIMITS TEST REPORT





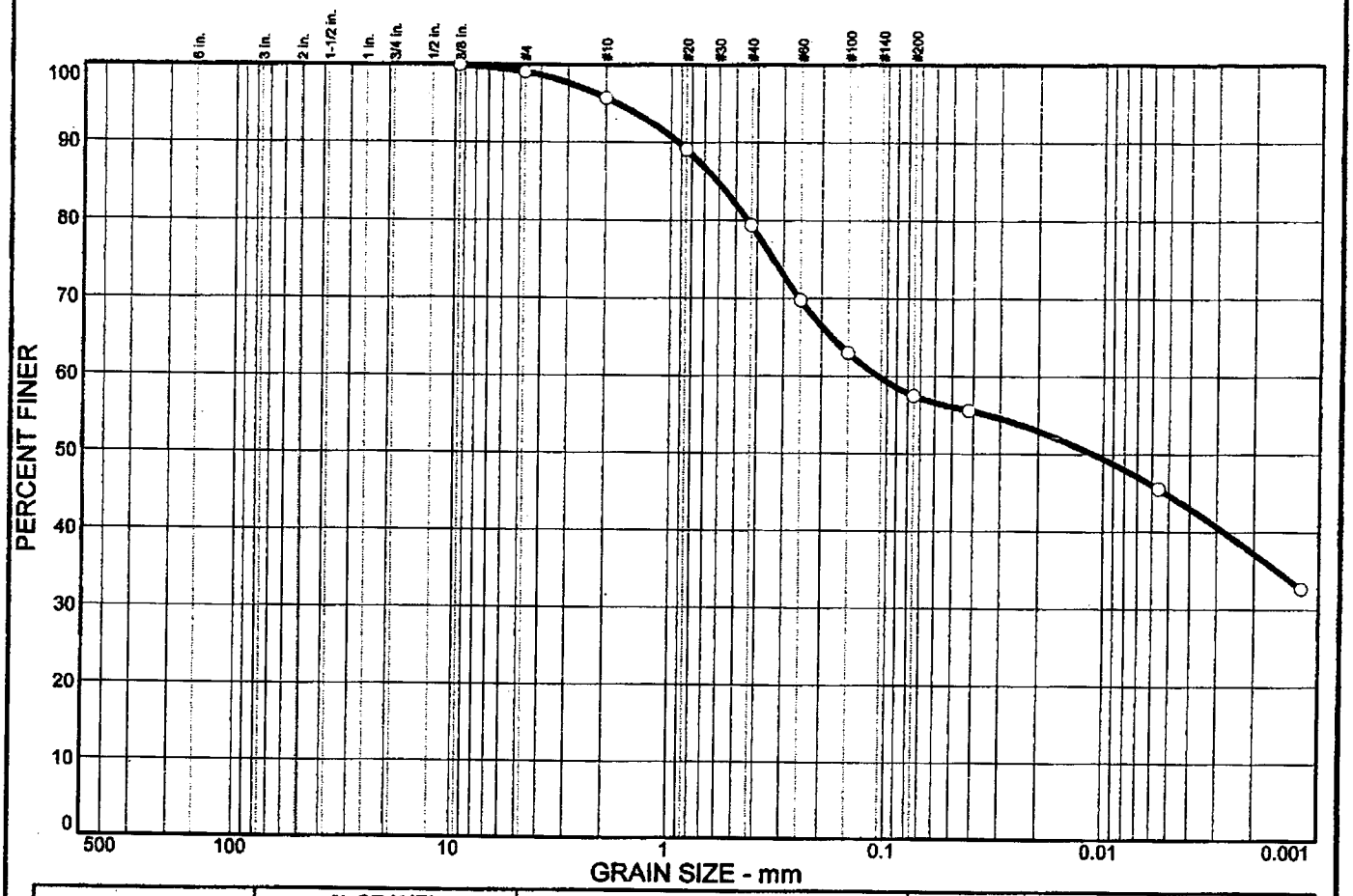
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	LOCUST AVE.,	LAB	1.1'-5.9'	8-20-02	MH	BROWN/TAN, GRAY MOTTLED, DAMP, HIGH	25.7	54	23
	STA.6+16.7, 9.4' RT. C.L.	#13887				PLASTICITY, STIFF, SANDY (WEATHERED CHERT			
						FRAGMENTS) ELASTIC SILT (MH), A-7-5(12).			

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● LOCUST AVE., STA.6+16.7, 9.4' RT. C.L.
LAB #13887

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.9	3.4	16.3	21.9	12.7	44.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.1		
#10	95.7		
#20	89.1		
#40	79.4		
#60	69.8		
#100	63.0		
#200	57.5		

* (no specification provided)

Soil Description

BROWN/TAN, GRAY MOTTLED, DAMP, HIGH PLASTICITY, STIFF, SANDY (WEATHERED CHERT FRAGMENTS) ELASTIC SILT (MH), A-7-5(12).

Atterberg Limits

PL= 31 LL= 54 PI= 23

Coefficients

D_{85}= 0.608 D_{60}= 0.110 D_{50}= 0.0110
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(12)

Remarks

LOCUST AVE. STA.6+16.7, 9.4' RT. C.L.
LAB #13887
F.M.=0.38

Sample No.: LAB #13887 **Source of Sample:** LOCUST AVE., STA.6+16.7, 9.4' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 1.1'-5.9'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 16

Date: 9-21-02

Project No.: 2095

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.9'-4.6'

Remarks: LOCUST AVE. STA.12+11, 9.3' RT. C.L.
LAB #13909

MATERIAL DESCRIPTION

Description: REDDISH BROWN TO DARK BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(28).

Classifications - **USCS:** CH **AASHTO:** A-7-6(28)

Nat. Moist. = 28.1 %

Liquid Limit = 56

% > No.4 = 1.2 %

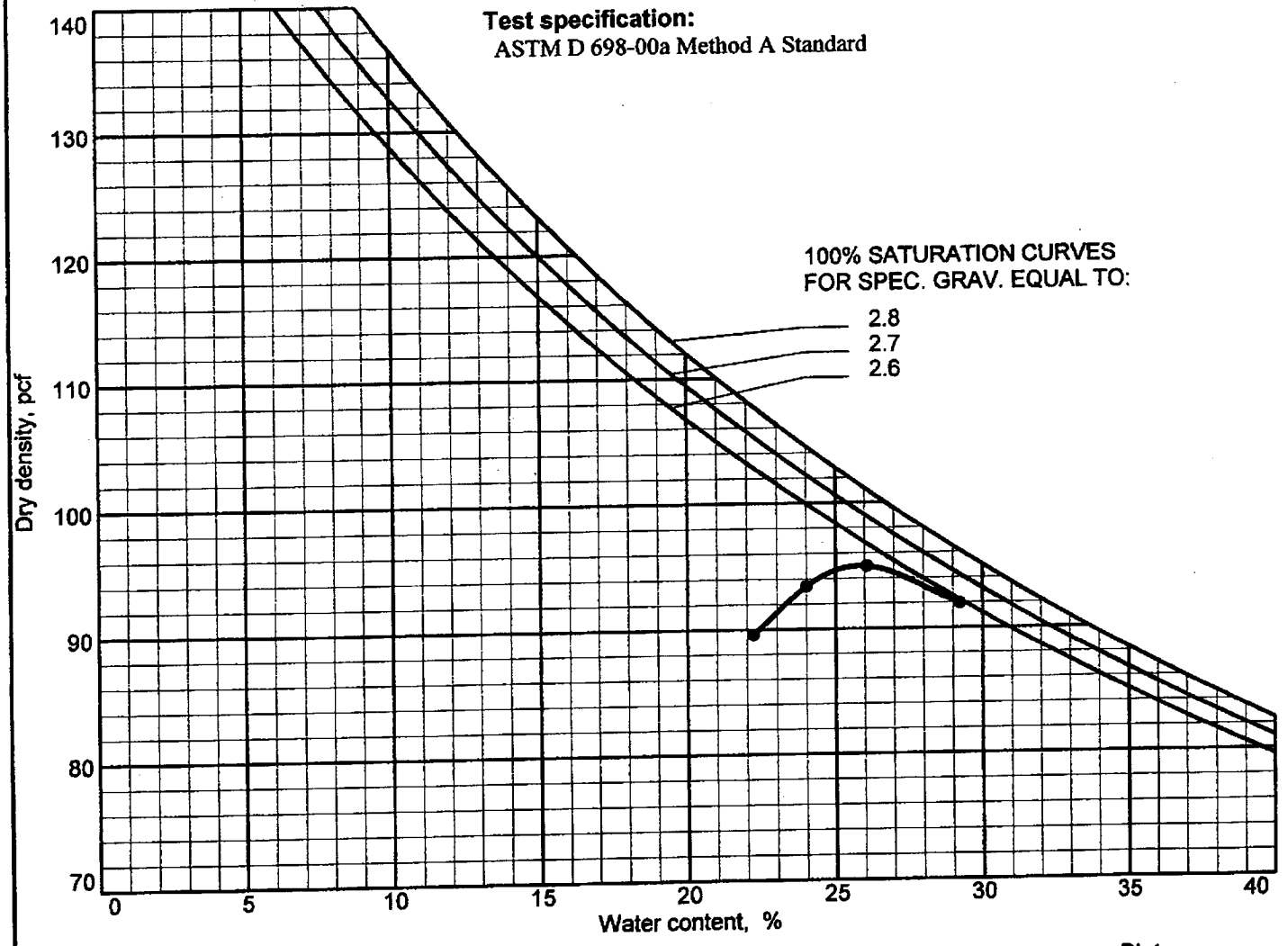
Sp.G. = 2.72

Plasticity Index = 33

% < No.200 = 80.8 %

TEST RESULTS
Maximum dry density = 95 pcf
Optimum moisture = 26 %

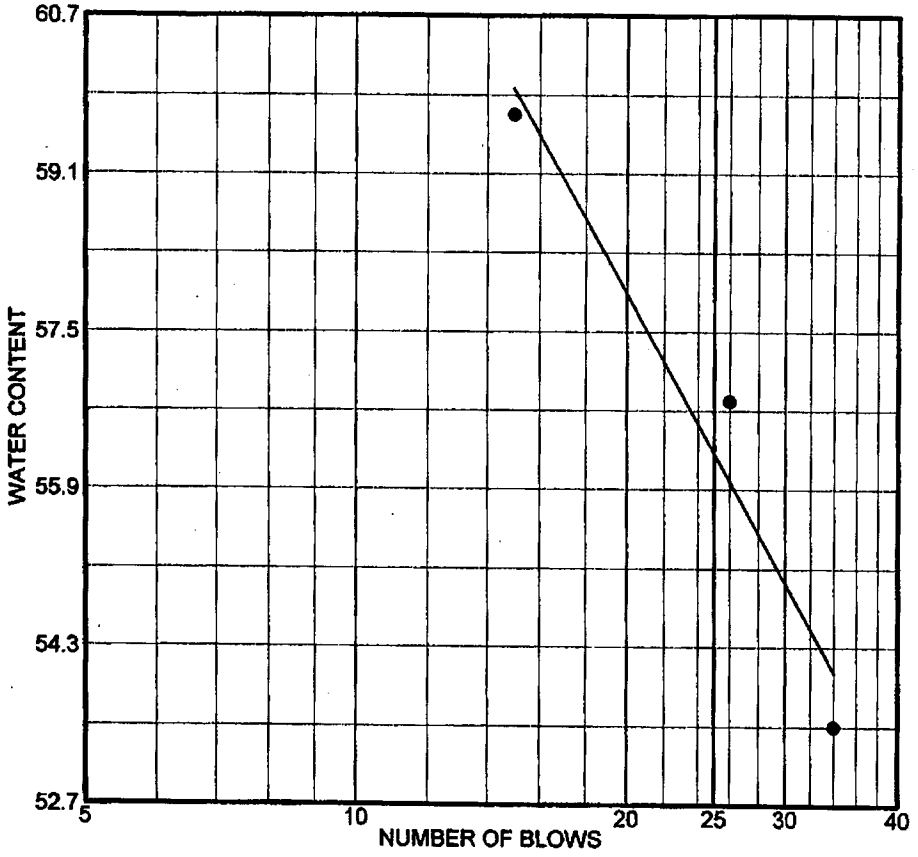
Test specification:
ASTM D 698-00a Method A Standard

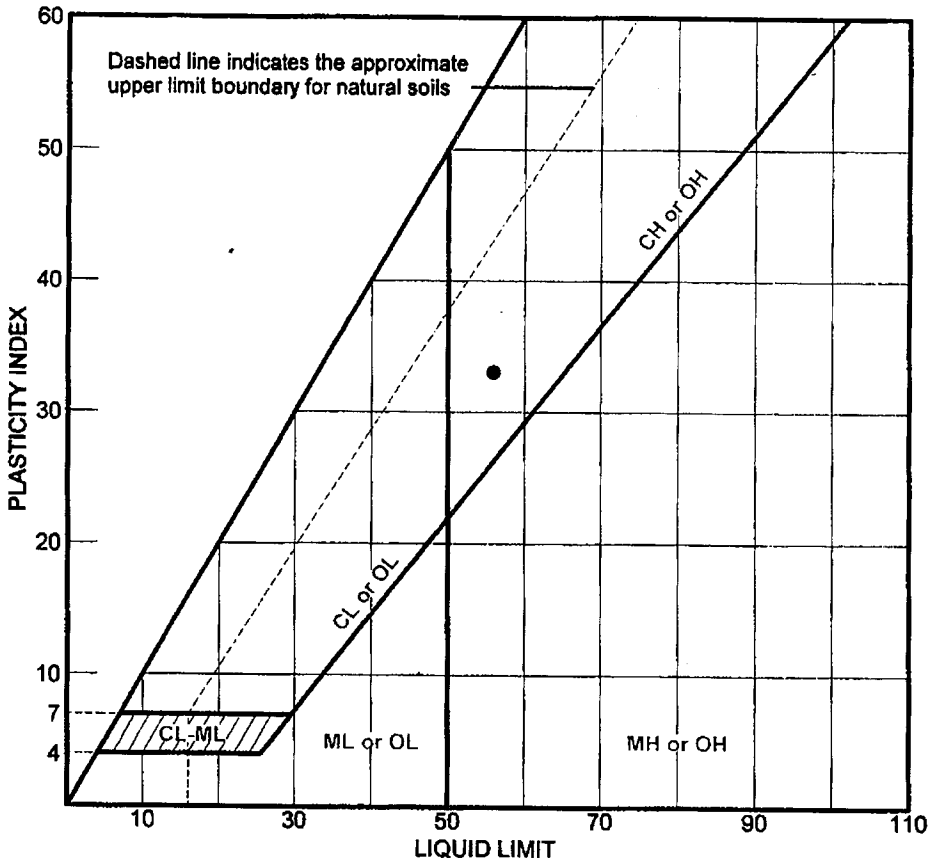


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	LOCUST AVE.	13909	0.9'-4.6'	8-21-02	CH	REDDISH BROWN TO DARK BROWN, DAMP, HIGH	28.1	56	33
	STA.12+11, 9.3' RT. C.L.					PLASTICITY, STIFF FAT CLAY (CH) WITH SAND			
						(PHOSPHATE NODULES), A-7-6(28).			

Client SHERMAN CARTER BARNHART, PSC

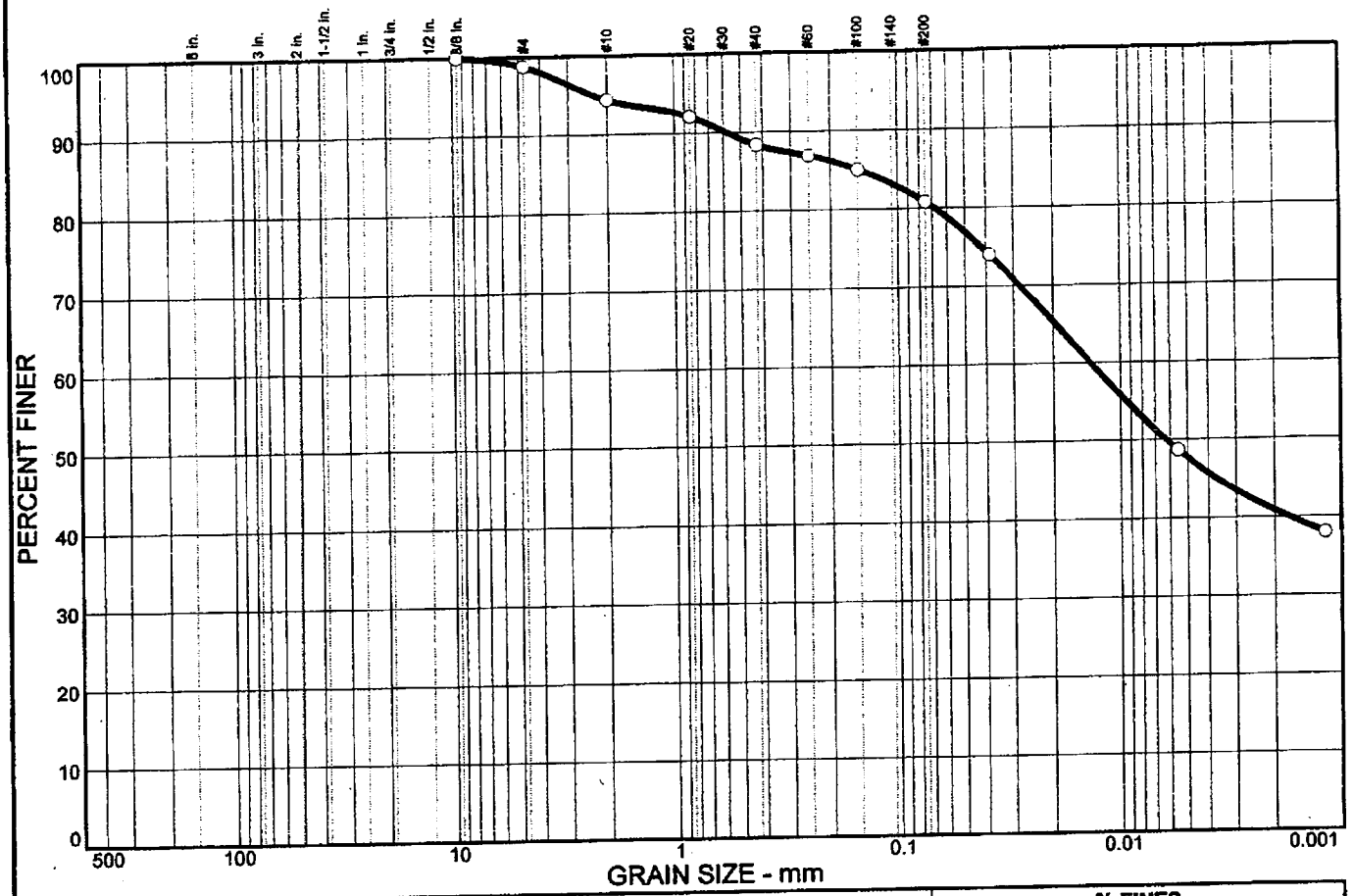
Project MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Project No. 2095 Plate

GREGG LABORATORIES, INC.

● LOCUST AVE. STA.12+11, 9.3' RT. C.L.
LAB #13909

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.2	4.4	6.0	7.6	33.1	47.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.8		
#10	94.4		
#20	92.1		
#40	88.4		
#60	86.9		
#100	85.0		
#200	80.8		

* (no specification provided)

Soil Description

REDDISH BROWN TO DARK BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(28).

Atterberg Limits

PL= 23 LL= 56 PI= 33

Coefficients

D_{85}= 0.150 D_{60}= 0.0136 D_{50}= 0.0062
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(28)

Remarks

LOCUST AVE. STA.12+11, 9.3' RT. C.L.
LAB #13909
F.M.=0.16

Sample No.: 13909 **Source of Sample:** LOCUST AVE. STA.12+11, 9.3' RT. C.L. **Date:** 8-21-02
Location: **Elev./Depth:** 0.9'-4.6'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 4

Project No.: 2095 **Date:** 9-20-01

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.8'-3.7'

Remarks: OAK HILL DR., STA.1+85, 6.6' RT. C.L.
LAB #13886

MATERIAL DESCRIPTION

Description: DARK BROWN, DAMP, SLIGHT PLASTICITY, MEDIUM SILT (ML), A-4(7).

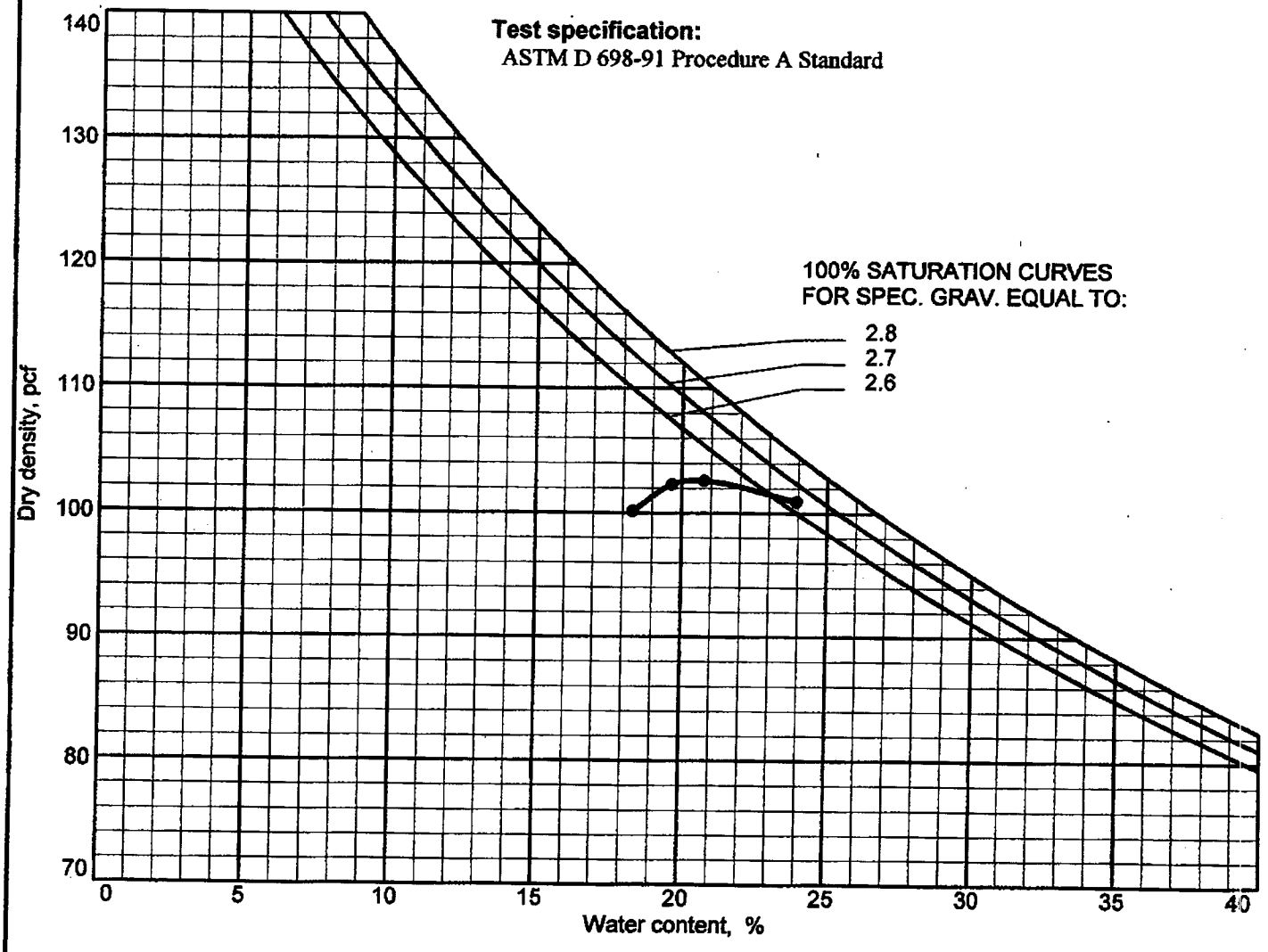
Classifications - **USCS:** ML **AASHTO:** A-4(7)

Nat. Moist. = 26.8 % **Sp.G. =** 2.68

Liquid Limit = 31 **Plasticity Index =** 7

% > No.4 = 0.1 % **% < No.200 =** 92.6 %

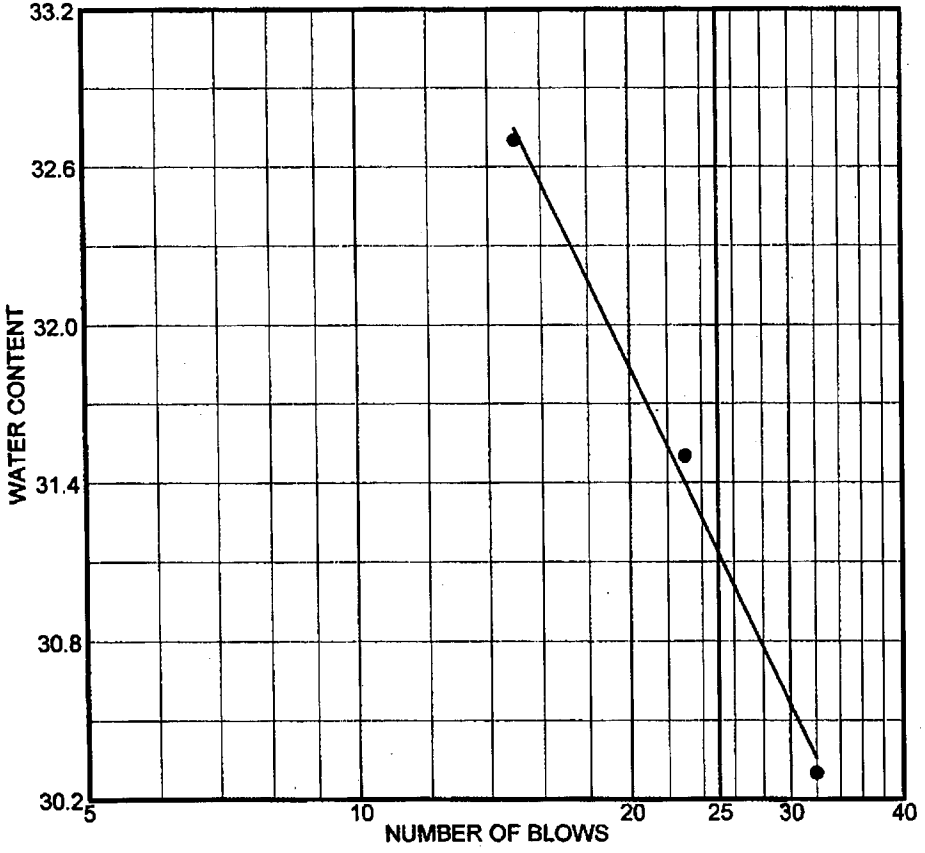
TEST RESULTS
Maximum dry density = 102.5 pcf
Optimum moisture = 20.5 %

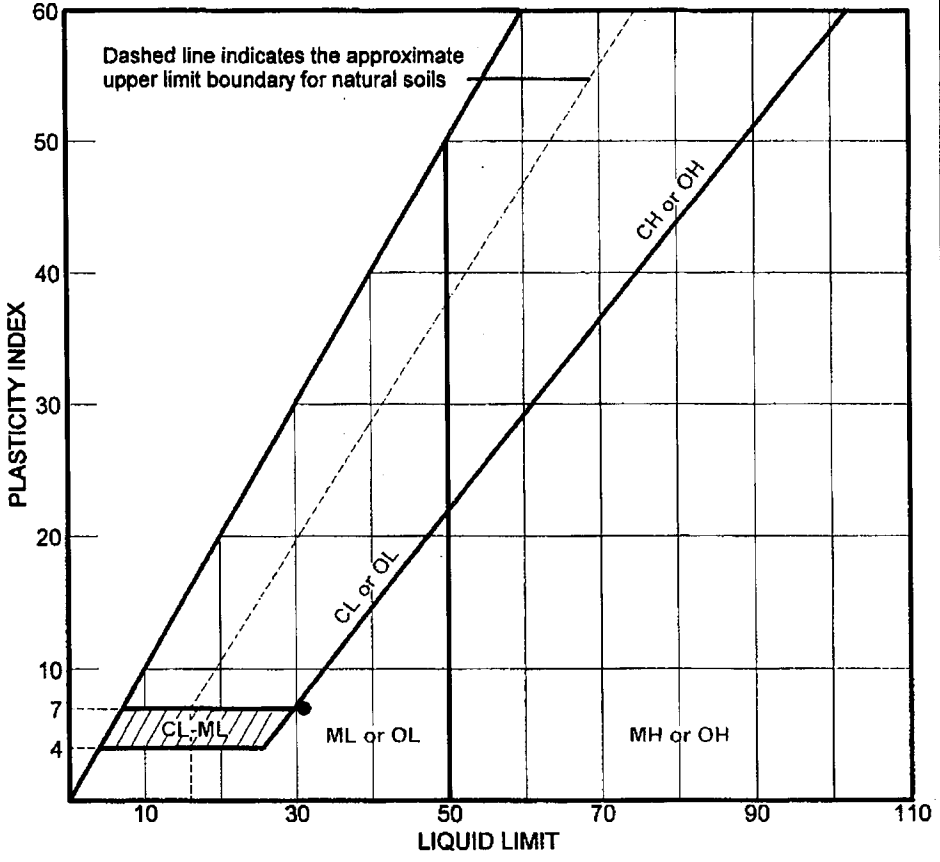


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	OAK HILL DR.,	13886	0.8'-3.7'	8-20-02	ML	DARK BROWN, DAMP, SLIGHT PLASTICITY, MEDIUM	26.8	31	7
	STA.1+85, 6.6' RT. C.L.					SILT (ML), A-4(7).			

Client SHERMAN CARTER BARNHART, PSC

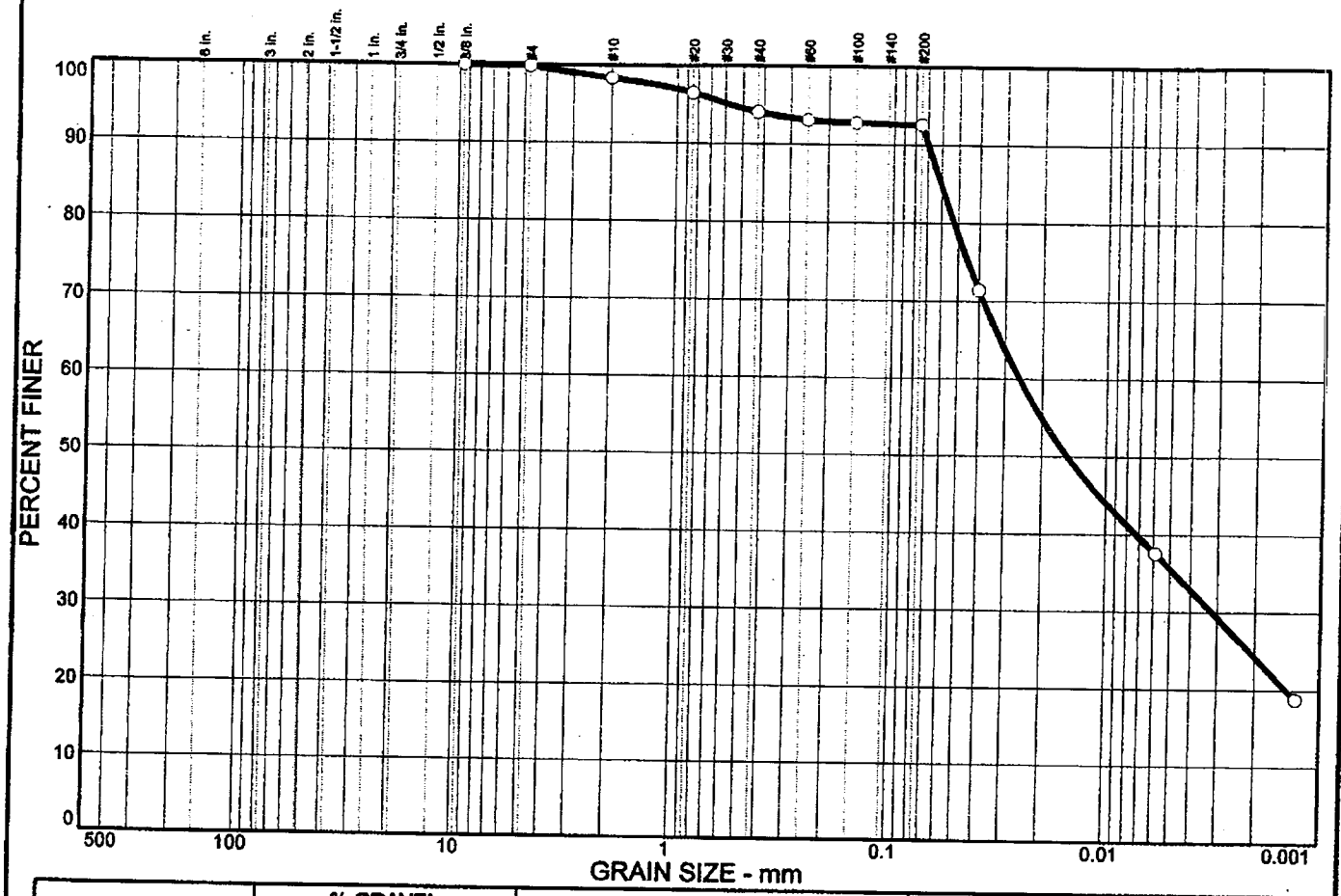
Project MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Project No. 2095 Plate

GREGG LABORATORIES, INC.

● OAK HILL DR., STA.1+85, 6.6' RT. C.L.
LAB #13886

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.1	1.6	4.2	1.5	56.9	35.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.9		
#10	98.3		
#20	96.5		
#40	94.1		
#60	93.1		
#100	92.8		
#200	92.6		

* (no specification provided)

Soil Description

DARK BROWN, DAMP, SLIGHT PLASTICITY, MEDIUM SILT (ML), A-4(7).

Atterberg Limits

PL= 24 LL= 31 PI= 7

Coefficients

D_{85}= 0.0605 D_{60}= 0.0256 D_{50}= 0.0150
D_{30}= 0.0032 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO= A-4(7)

Remarks

OAK HILL DR. STA.1+85, 6.6' RT. C.L.
LAB #13886
F.M.=0.07

Sample No.: 13886 **Source of Sample:** OAK HILL DR., STA.1+85, 6.6' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 0.8'-3.7'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 3

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 1.1'-3.8'

Remarks: OAK HILL DR. STA.9+33, 8.3' RT. C.L.
LAB #13885

MATERIAL DESCRIPTION

Description: MEDIUM BROWN/ORANGE BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATES NODULES), A-7-6(25).

Classifications - **USCS:** CH **AASHTO:** A-7-6(25)

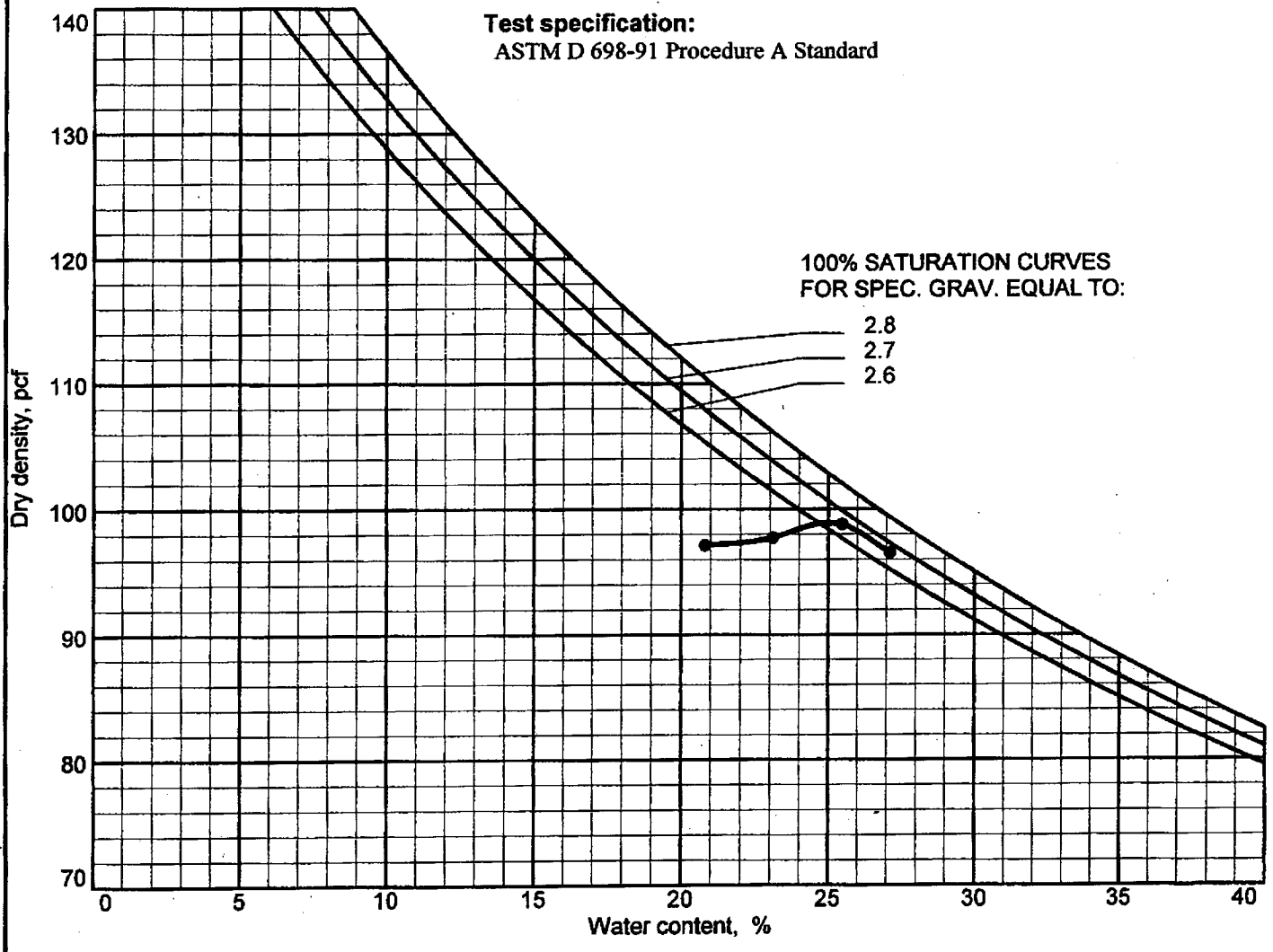
Nat. Moist. = 23.5 % **Sp.G. =** 2.68

Liquid Limit = 55 **Plasticity Index =** 34

% > No.4 = 1.0 % **% < No.200 =** 74.6 %

TEST RESULTS
Maximum dry density = 99 pcf
Optimum moisture = 25 %

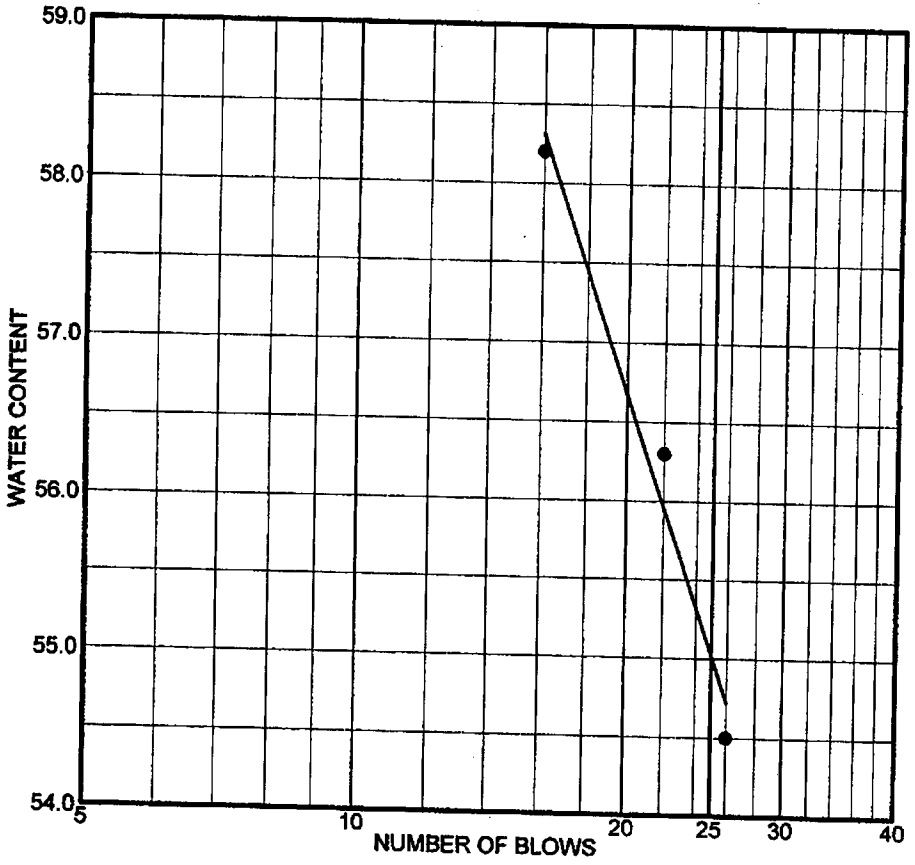
Test specification:
ASTM D 698-91 Procedure A Standard

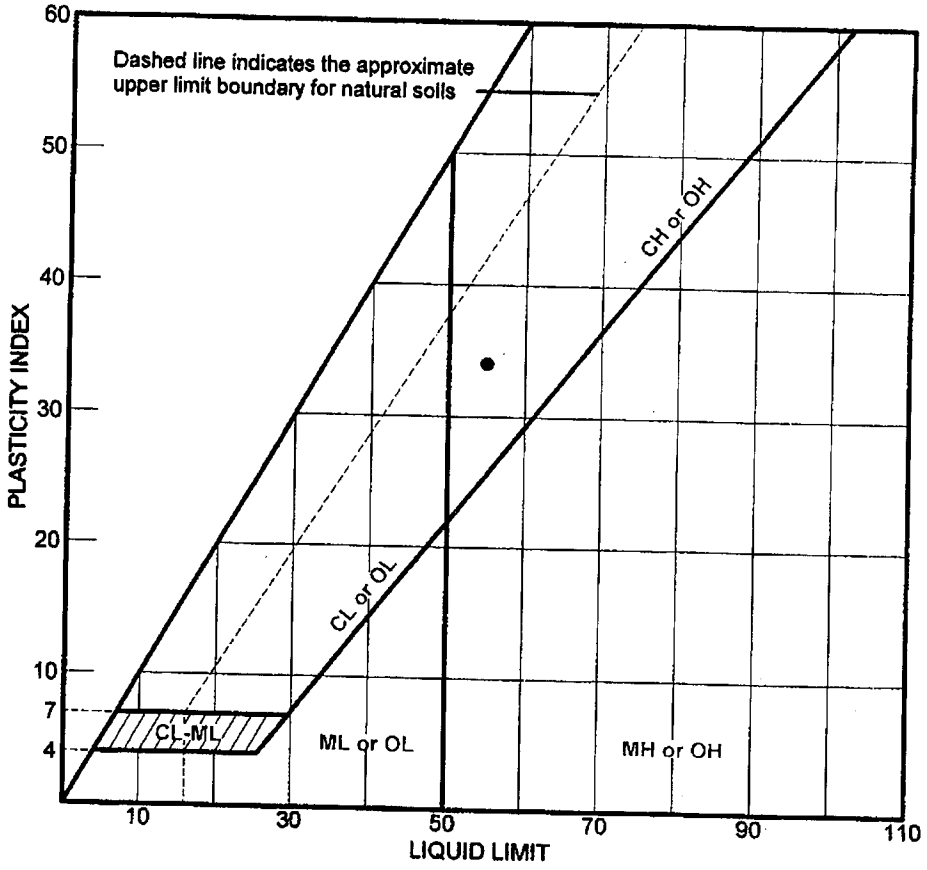


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	OAK HILL DR. STA.9+33, 8.3' RT. C.L.	13885	1.1'-3.8'	8-20-02	CH	MEDIUM BROWN/ORANGE BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATES NODULES), A-7-6(25).	23.5	55	34

Client SHERMAN CARTER BARNHART, PSC

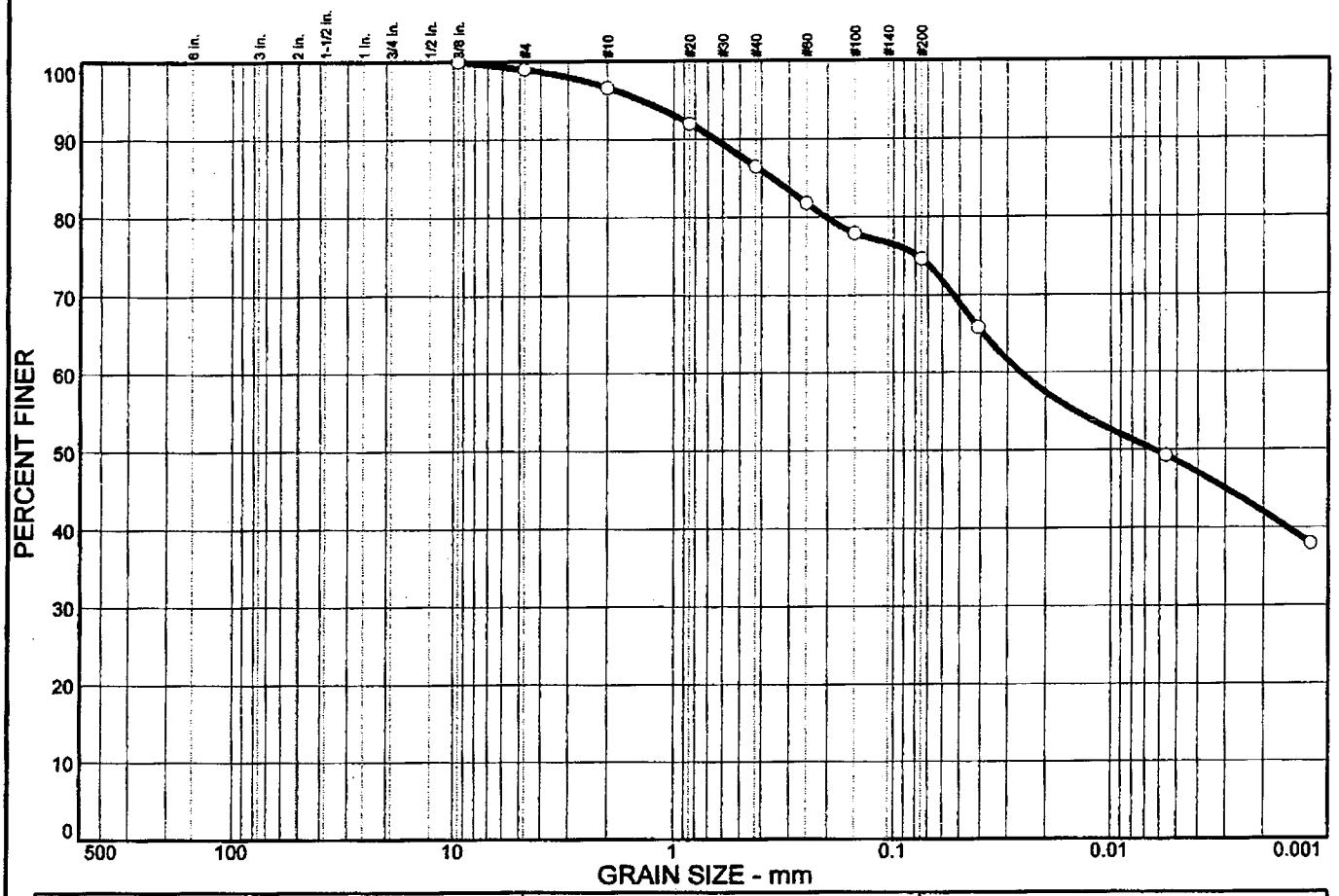
Project MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Project No. 2095 Plate

GREGG LABORATORIES, INC.

● OAK HILL DR.,STA.9+33, 8.3' RT. C.L.
LAB #13885

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.0	2.4	10.1	11.9	26.0	48.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.0		
#10	96.6		
#20	92.0		
#40	86.5		
#60	81.8		
#100	77.9		
#200	74.6		

* (no specification provided)

Soil Description

MEDIUM BROWN/ORANGE BROWN, DAMP, VERY HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATES NODULES), A-7-6(25).

Atterberg Limits

PL= 21 LL= 55 PI= 34

Coefficients

D_{85}= 0.358 D_{60}= 0.0260 D_{50}= 0.0063
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(25)

Remarks

OAK HILL DR., STA.9+33, 8.3' RT. C.L.
LAB #13885
F.M.=0.23

Sample No.: 13885 **Source of Sample:** OAK HILL DR. STA.9+33, 8.3' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 1.1'-3.8'

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Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 1

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 1.2'-2.2'

Remarks: OAK HILL DR., STA.14+52.8, 6' RT. C.L. LAB #13883

MATERIAL DESCRIPTION

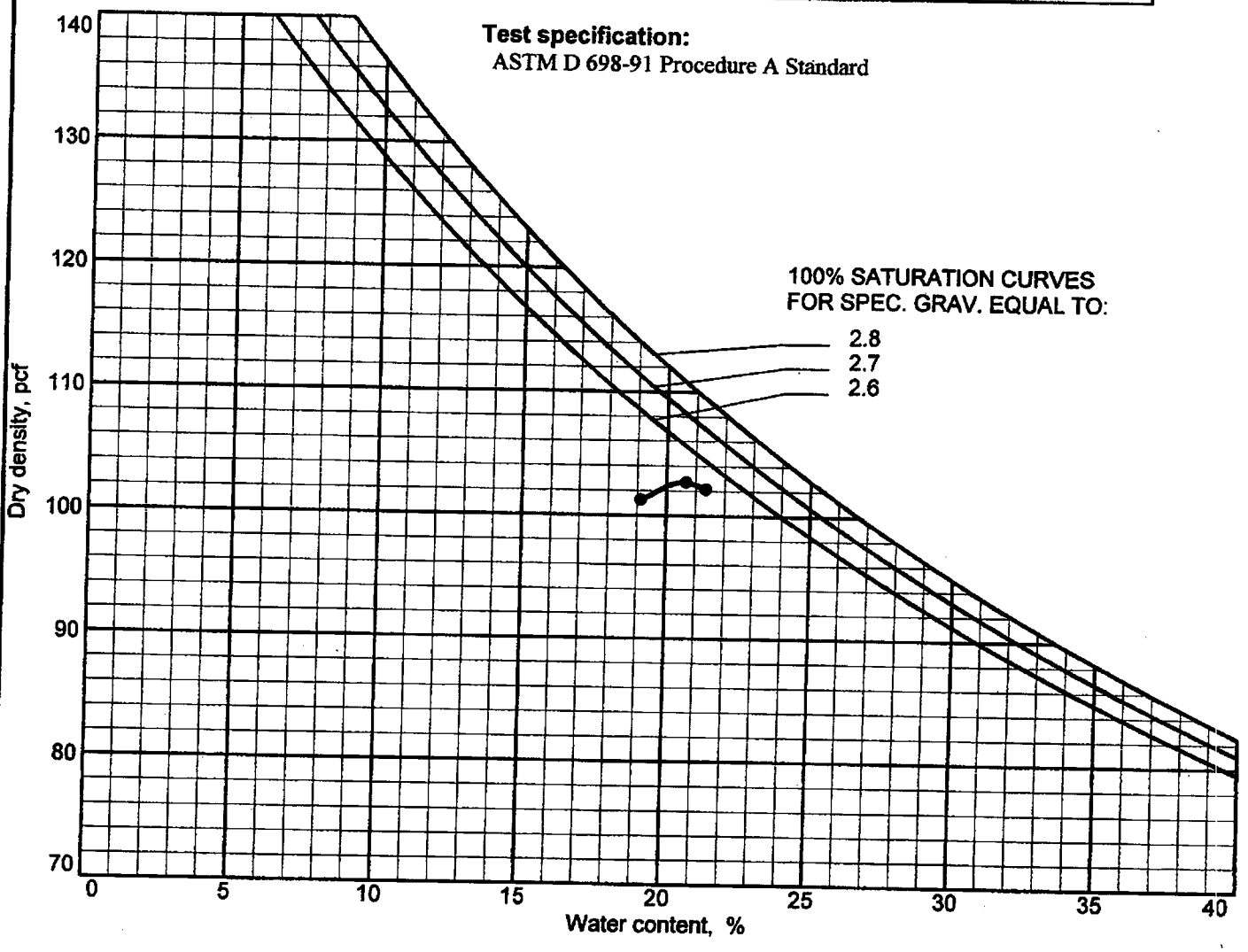
Description: LIGHT BROWN TO DARK BROWN, DAMP, MEDIUM PLASTICITY, MEDIUM SANDY (WEATHERED CHERT FRAGMENTS AND PHOSPHATE NODULES) LEAN CLAY (CL), A-6(5).

Classifications - **USCS:** CL **AASHTO:** A-6(5)

Nat. Moist. = 20.5 %
Liquid Limit = 37
% > No.4 = 0.6 %
Sp.G. = 2.65
Plasticity Index = 14
% < No.200 = 52.6 %

TEST RESULTS
Maximum dry density = 102.5 pcf
Optimum moisture = 20.5 %

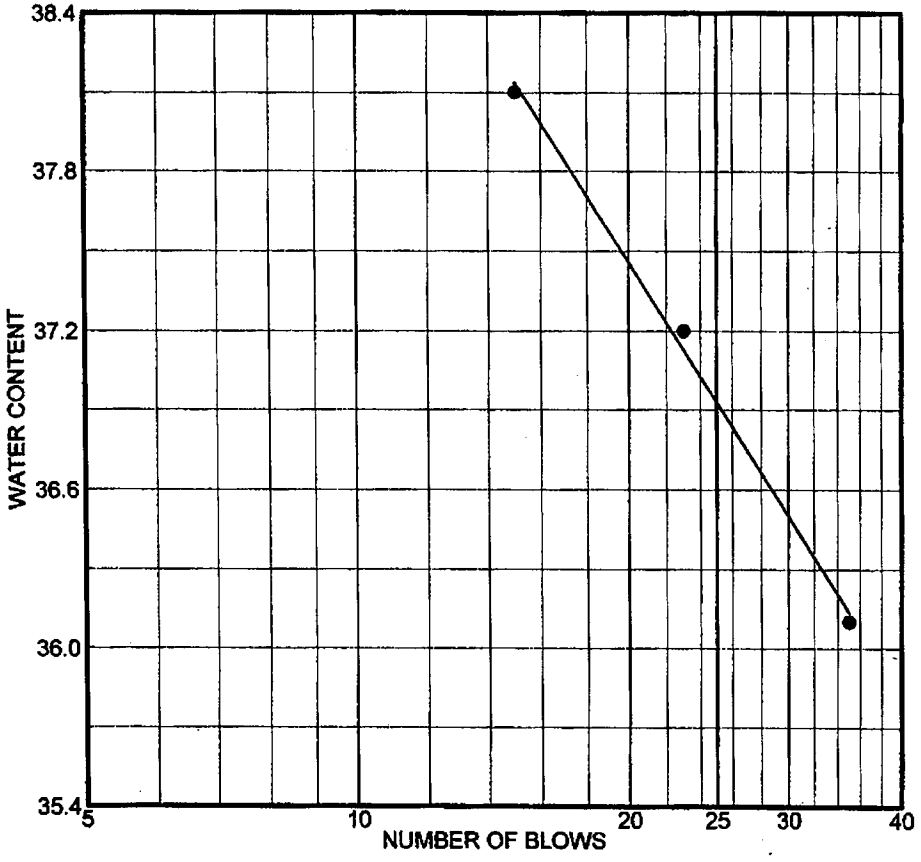
Test specification:
ASTM D 698-91 Procedure A Standard

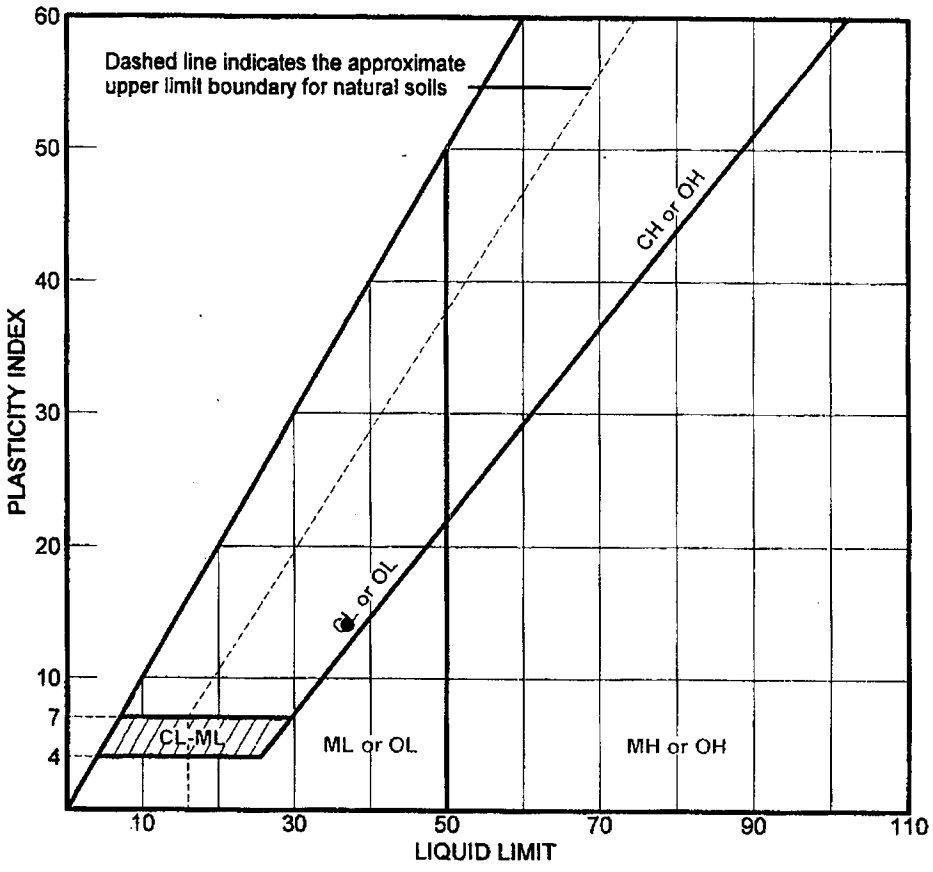


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	OAK HILL DR.,	13883	1.2'-2.2'	8-20-02	CL	LIGHT BROWN TO DARK BROWN, DAMP, MEDIUM	20.5	37	14
	STA.14+52.8, 6' RT. C.L.					PLASTICITY, MEDIUM SANDY (WEATHERED CHERT			
						FRAGMENTS AND PHOSPHATE NODULES) LEAN CLAY			
						(CL), A-6(5).			

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

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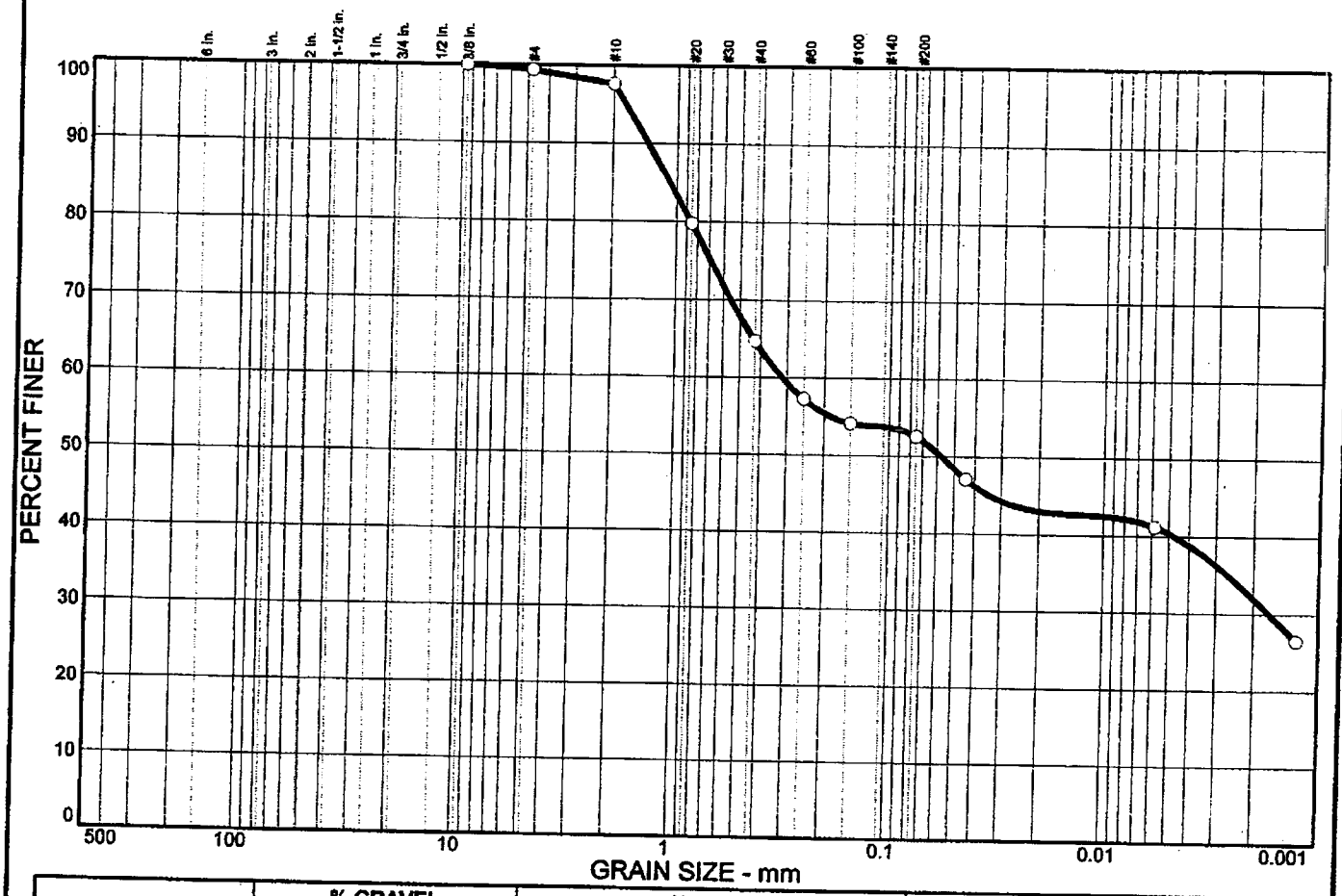
● OAK HILL DR., STA.14+52.8,6' RT. C.L.
LAB #13883

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.6	1.8	32.9	12.1	12.2	40.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.4		
#10	97.6		
#20	79.8		
#40	64.7		
#60	57.3		
#100	54.2		
#200	52.6		

* (no specification provided)

Soil Description

LIGHT BROWN TO DARK BROWN, DAMP, MEDIUM PLASTICITY, MEDIUM SANDY (WEATHERED CHERT FRAGMENTS AND PHOSPHATE NODULES) LEAN CLAY (CL), A-6(5)

Atterberg Limits

PL= 23 LL= 37 PI= 14

Coefficients

D_{85}= 1.08 D_{60}= 0.316 D_{50}= 0.0571
D_{30}= 0.0017 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

OAK HILL DR., STA.14+52.8, 6' RT. C.L.
LAB #13883
F.M.=0.46

Sample No.: 13883 **Source of Sample:** OAK HILL DR., STA.14+52.8, 6' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 1.2'-2.2'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 2

Project No.: 2095 **Date:** 9-20-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 2.2'-4.2'

Remarks: OAK HILL DR. STA.14+52.8, 6' RT. C.L.
LAB #13884

MATERIAL DESCRIPTION

Description: BROWN TO REDDISH BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (WEATHERED CHERT FRAGMENTS), A-7-6(23).

Classifications - **USCS:** CH **AASHTO:** A-7-6(23)

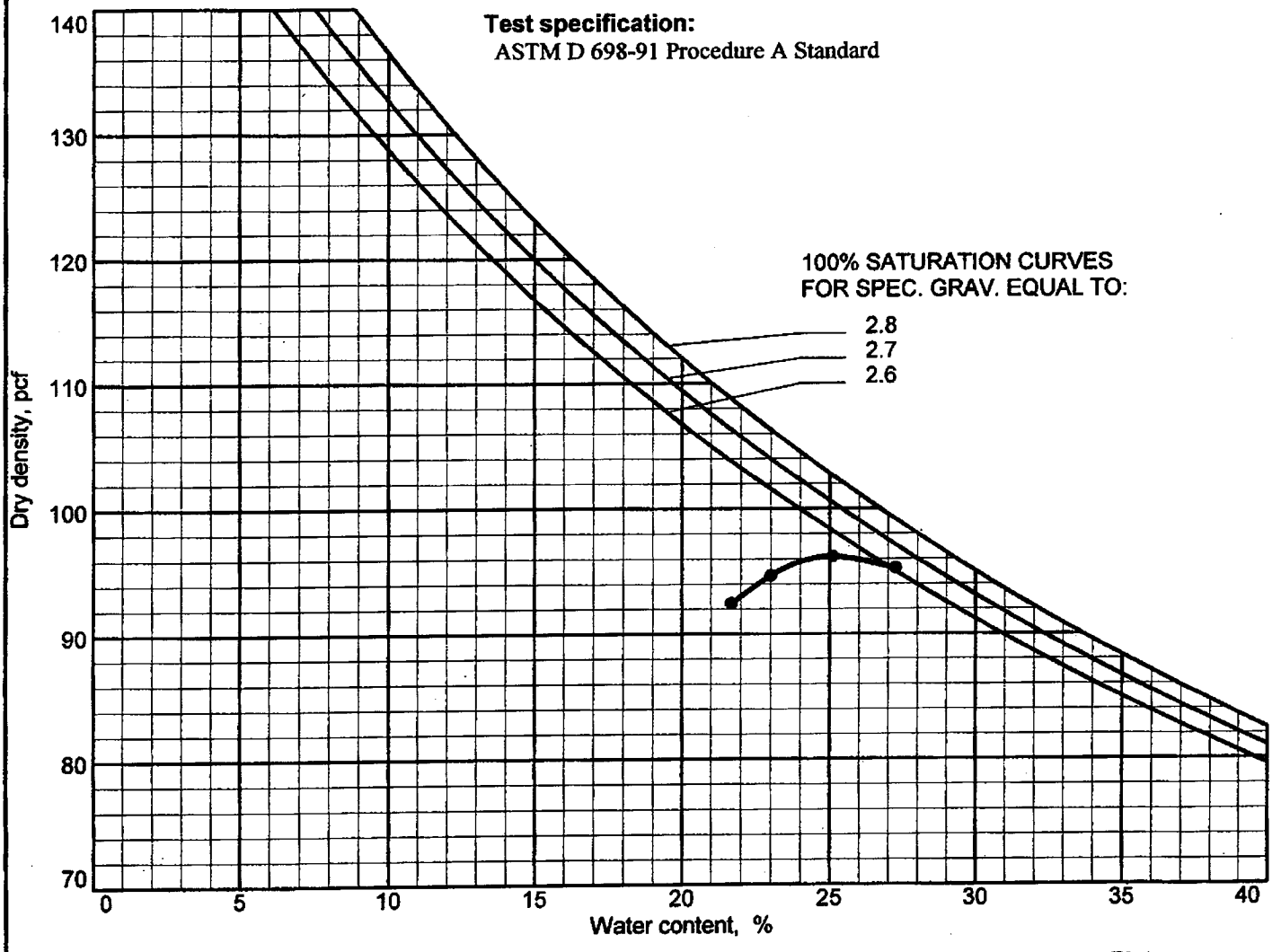
Nat. Moist. = 26.2 % **Sp.G. =** 2.65

Liquid Limit = 50 **Plasticity Index =** 26

% > No.4 = 0.5 % **% < No.200 =** 84.5 %

TEST RESULTS
Maximum dry density = 96 pcf
Optimum moisture = 25 %

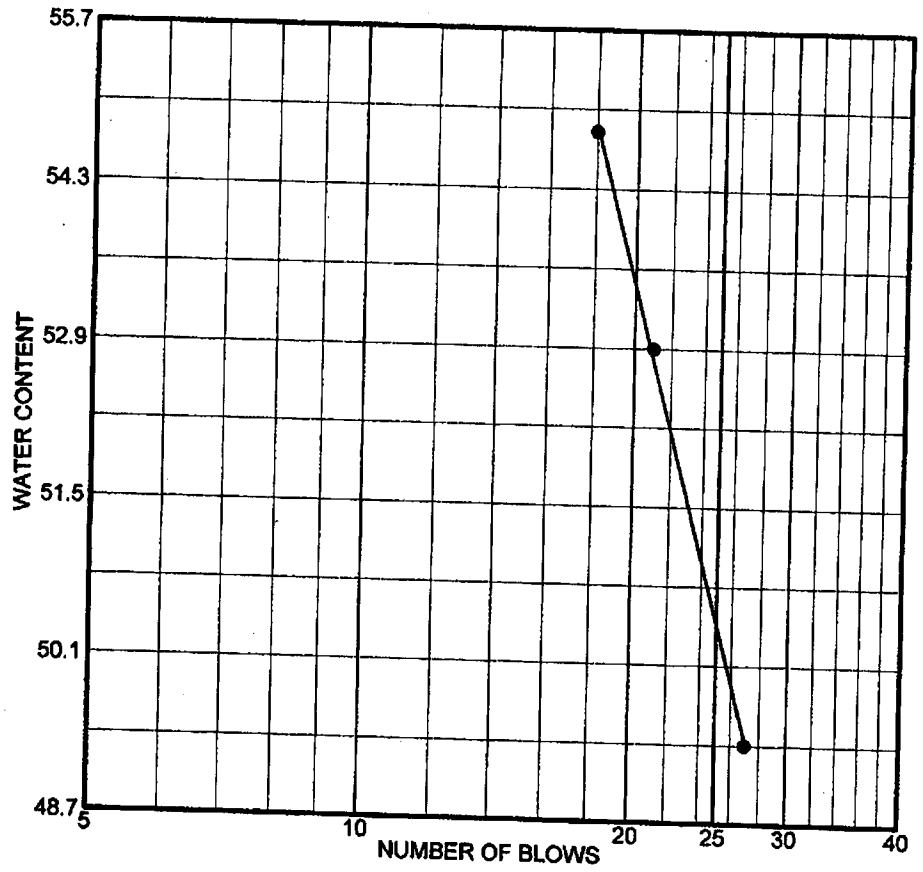
Test specification:
ASTM D 698-91 Procedure A Standard

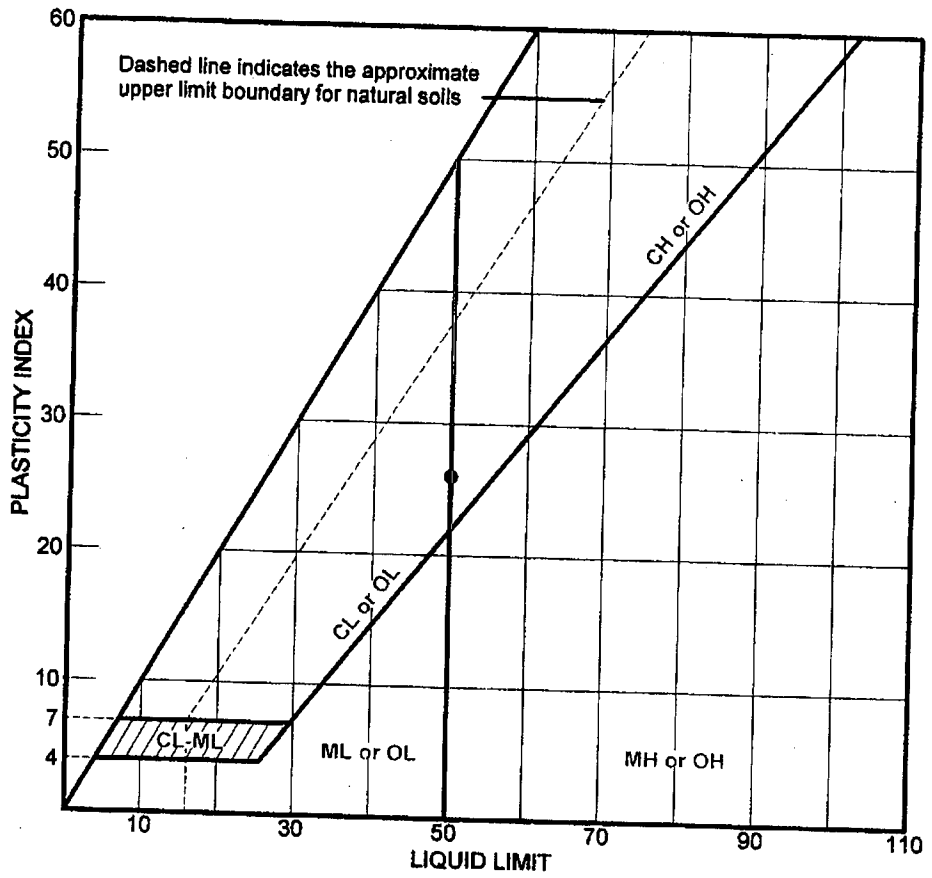


Plate

GREGG LABORATORIES, INC.

LIQUID AND PLASTIC LIMITS TEST REPORT





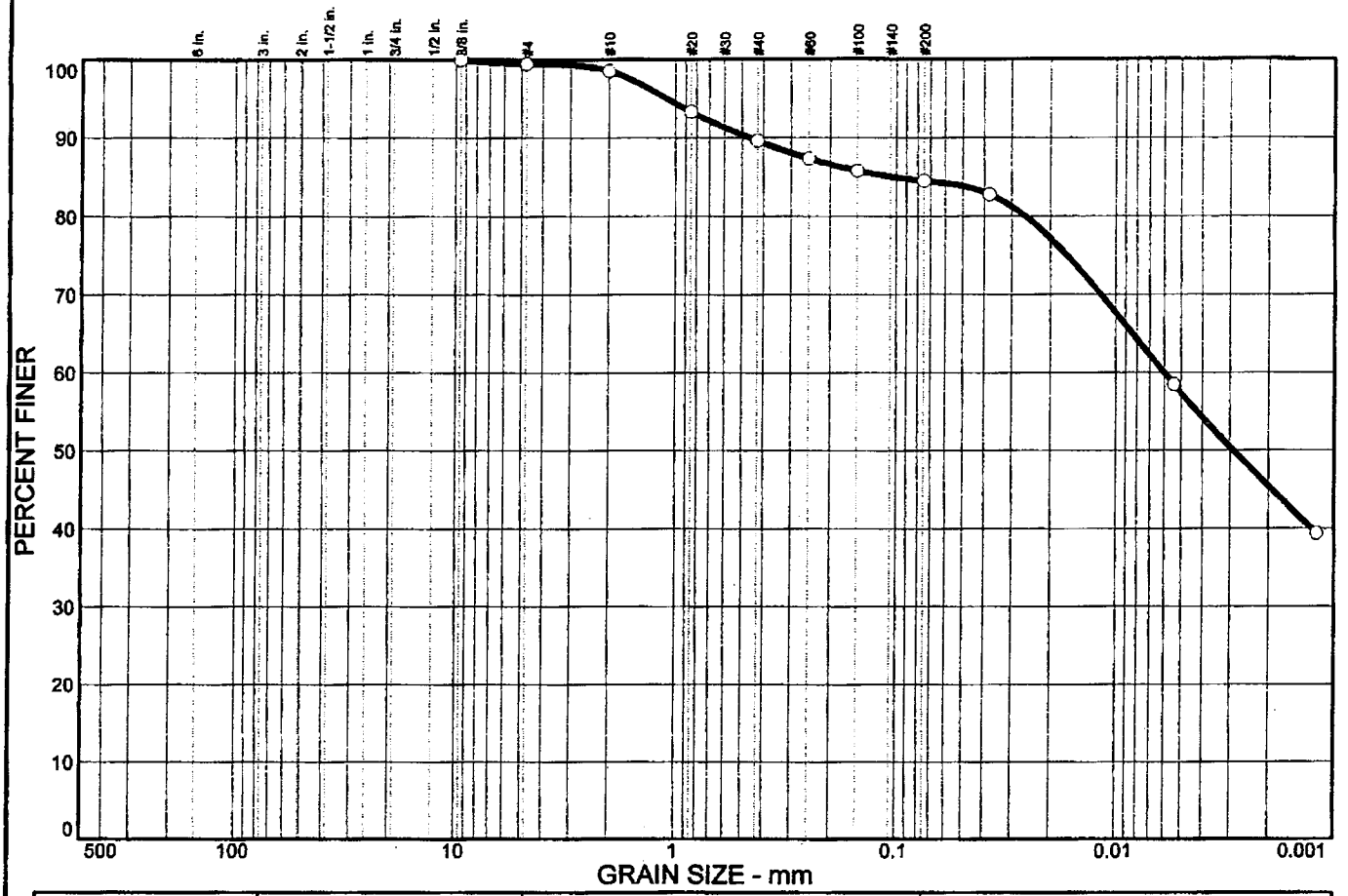
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	OAK HILL DR., STA.14+52.8, 6' RT. C.L.	13884	2.2'-4.2'	8-20-02	CH	BROWN TO REDDISH BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (WEATHERED CHERT FRAGMENTS), A-7-6(23).	26.2	50	26

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● OAK HILL DR., STA.14+52.8, 6' RT. C.L.
LAB #13884

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.5	1.0	8.9	5.1	27.1	57.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.5		
#10	98.5		
#20	93.3		
#40	89.6		
#60	87.4		
#100	85.8		
#200	84.5		

* (no specification provided)

Soil Description

BROWN TO REDDISH BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (WEATHERED CHERT FRAGMENTS), A-7-6(23).

Atterberg Limits

PL= 24 LL= 50 PI= 26

Coefficients

D_{85}= 0.104 D_{60}= 0.0060 D_{50}= 0.0029
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(23)

Remarks

OAK HILL DR., STA.14+52.8, 6' RT., CL.L.
LAB #13884
F.M.=0.15

Sample No.: 13884 **Source of Sample:** OAK HILL DR., STA.14+52.8, 6' RT. C.L. **Date:** 8-20-02
Location: **Elev./Depth:** 2.2'-4.2'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 12

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.2'-5.2'

Remarks: PARK VIEW AVE. STA.0+99.7, 14.3' RT. C.L.
LAB #13905

MATERIAL DESCRIPTION

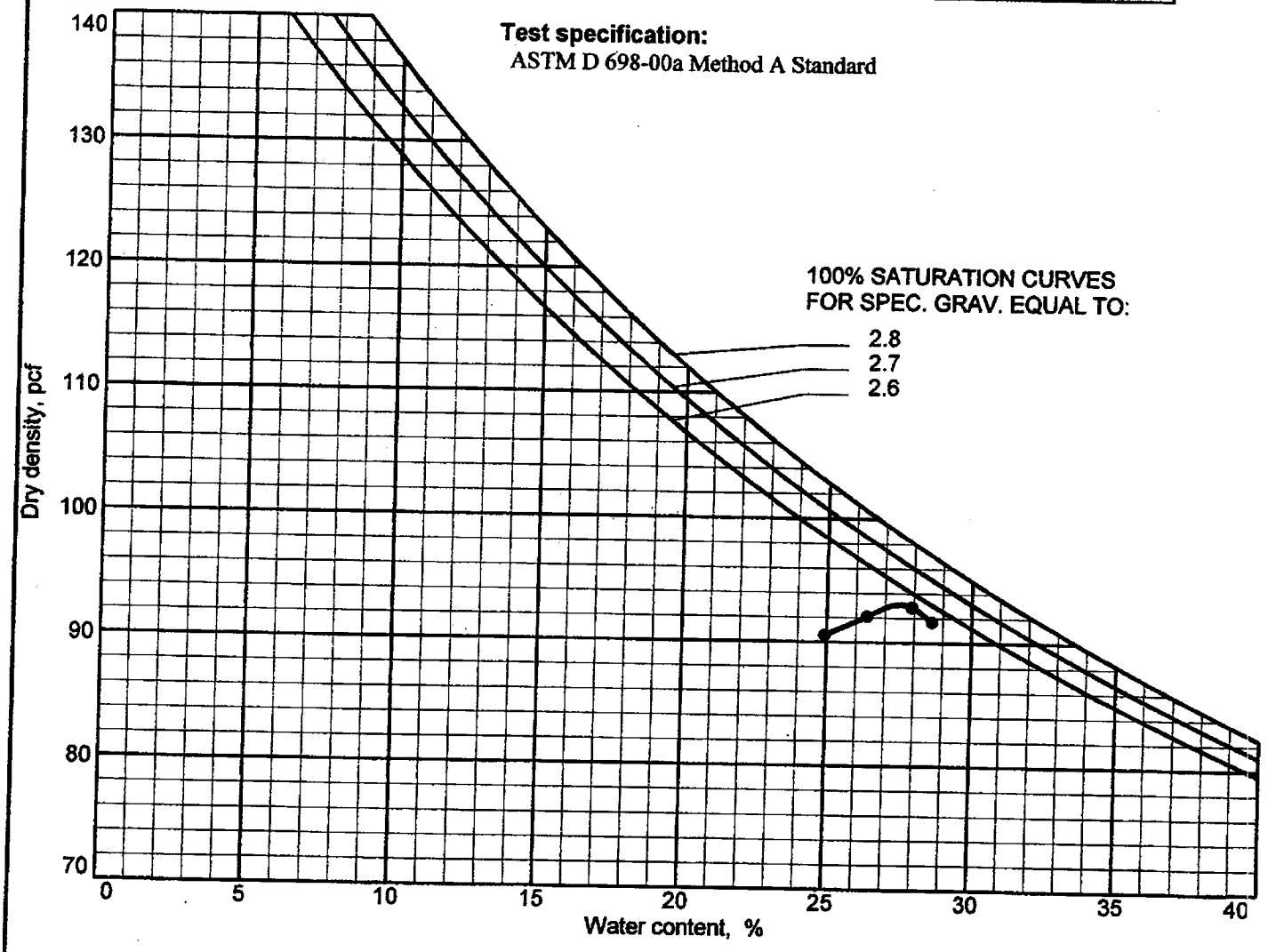
Description: LIGHT BROWN TO ORANGE BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(30).

Classifications - **USCS:** CH **AASHTO:** A-7-6(30)

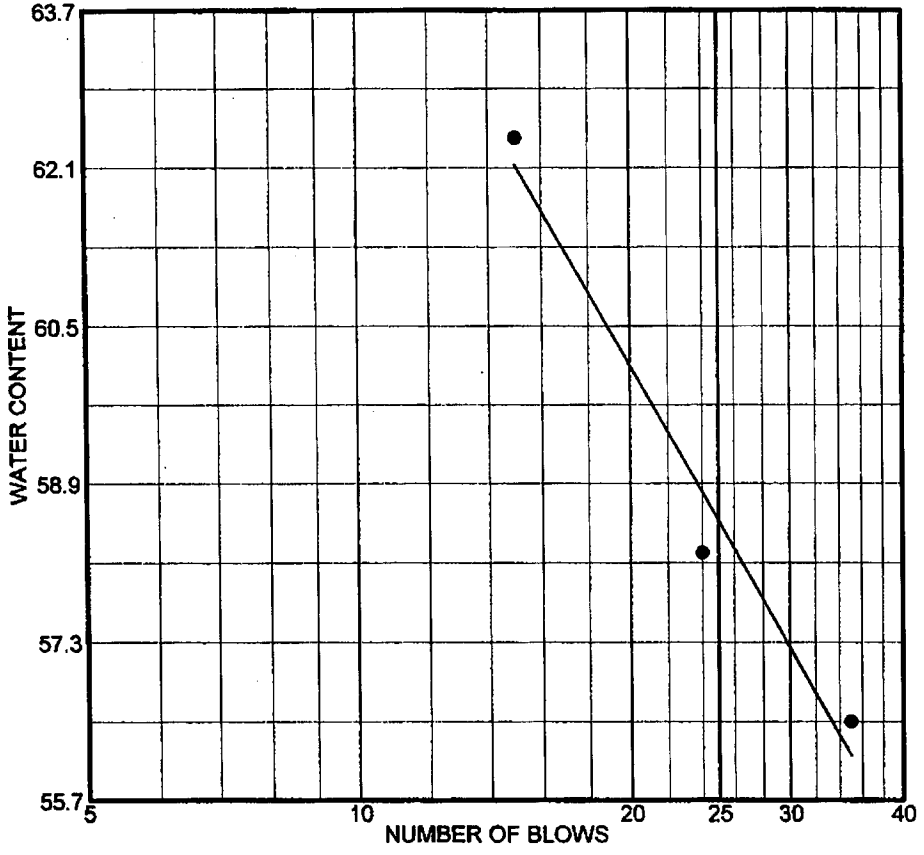
Nat. Moist. = 24.4 %
Sp.G. = 2.78
Liquid Limit = 59
Plasticity Index = 33
% > No.4 = 0.0 %
% < No.200 = 82.7 %

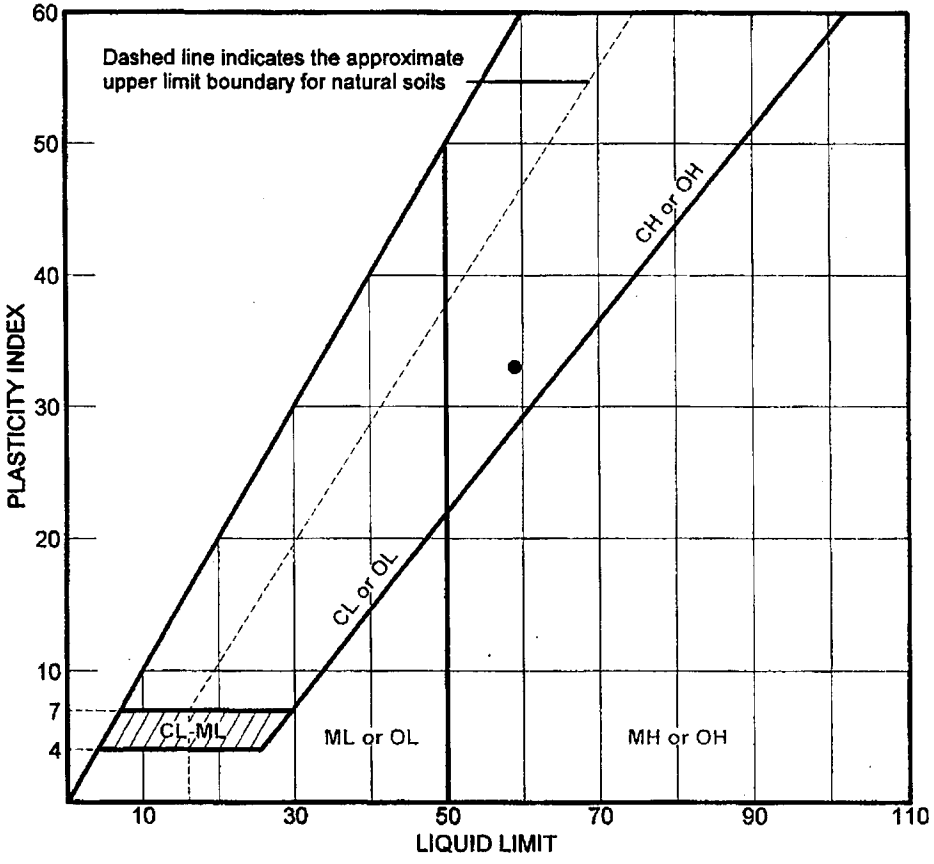
TEST RESULTS
Maximum dry density = 93 pcf
Optimum moisture = 27.5 %

Test specification:
ASTM D 698-00a Method A Standard



LIQUID AND PLASTIC LIMITS TEST REPORT





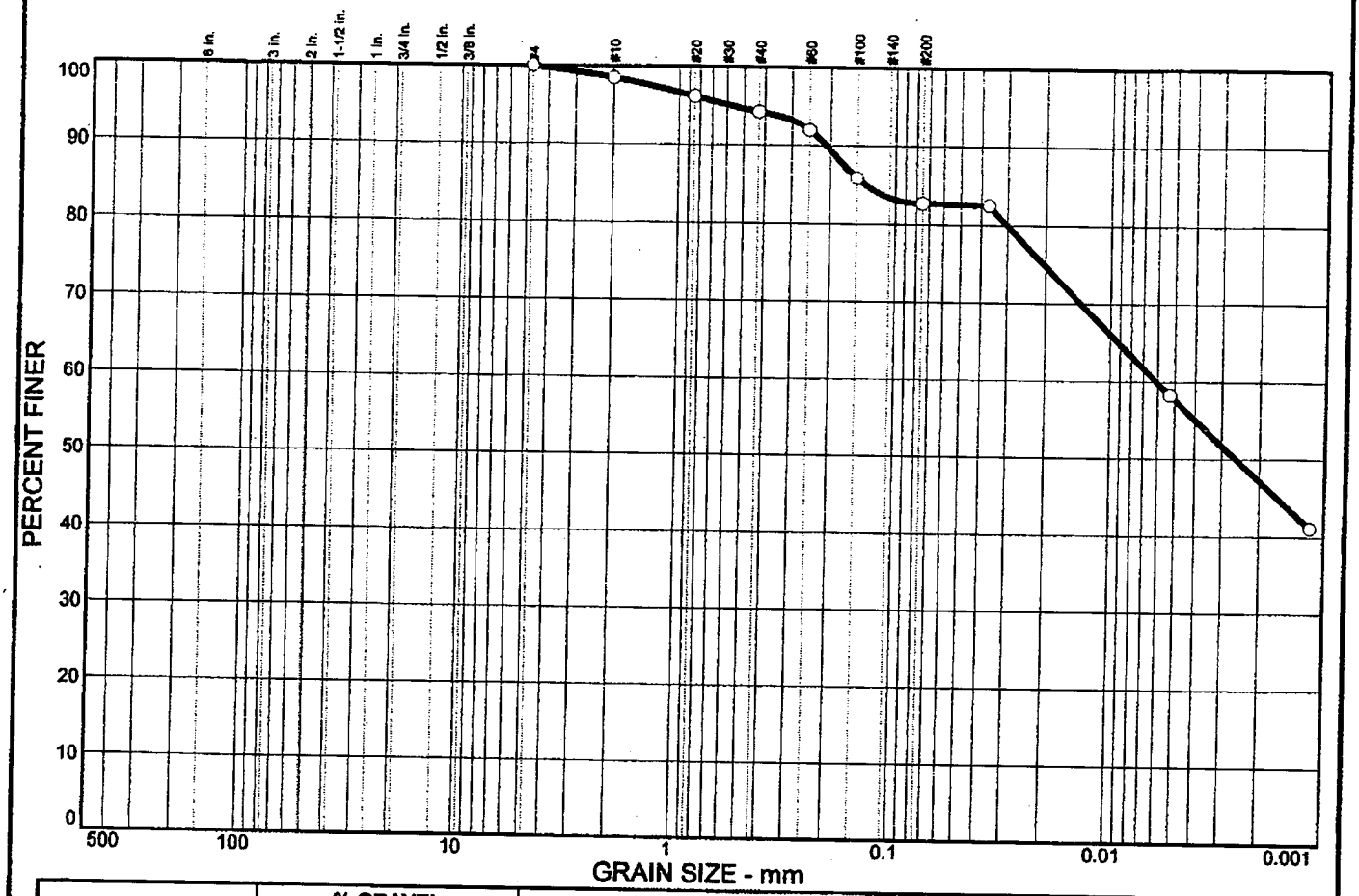
	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	PARK VIEW AVE.	13905	0.2'-5.2'	8-21-02	CH	LIGHT BROWN TO ORANGE BROWN, DAMP, HIGH	24.4	59	33
	STA.0+99.7, 14.3' RT.					PLASTICITY, STIFF FAT CLAY (CH) WITH SAND			
	C.L.					(PHOSPHATE NODULES), A-7-6(30).			

Client SHERMAN CARTER BARNHART, PSC
Project MEADOWS-NORTHLAND-ARLINGTON
NEIGHBORHOOD IMPROVEMENT PROJECT
Project No. 2095 Plate

GREGG LABORATORIES, INC.

● PARK VIEW AVE. STA.0+99.7, 14.3' RT. C.L.
LAB #13905

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	1.5	4.2	11.6	25.0	57.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.5		
#20	96.2		
#40	94.3		
#60	92.0		
#100	85.9		
#200	82.7		

* (no specification provided)

Soil Description

LIGHT BROWN TO ORANGE BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(30).

Atterberg Limits

PL= 26 LL= 59 PI= 33

Coefficients

D_{85}= 0.137 D_{60}= 0.0061 D_{50}= 0.0026
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remarks

PARK VIEW AVE. STA.0+99.7, 14.3' RT C.L.
LAB #13905
F.M.=0.14

Sample No.: 13905 **Source of Sample:** PARK VIEW AVE. STA.0+99.7, 14.3' RT. C **Date:** 8-21-02
Location: **Elev./Depth:** 0.2'-5.2'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

COMPACTION TEST REPORT

Curve No.: 11

Project No.: 2095 **Date:** 9-21-02

Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT

Location: PHASE 5

Elev./Depth: 0.9'-3.7'

Remarks: PARK VIEW AVE. STA.4+58.2, 13.2' RT. C.L. LAB #13904

MATERIAL DESCRIPTION

Description: BROWN TO YELLOW/BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(24).

Classifications - **USCS:** CH **AASHTO:** A-7-6(24)

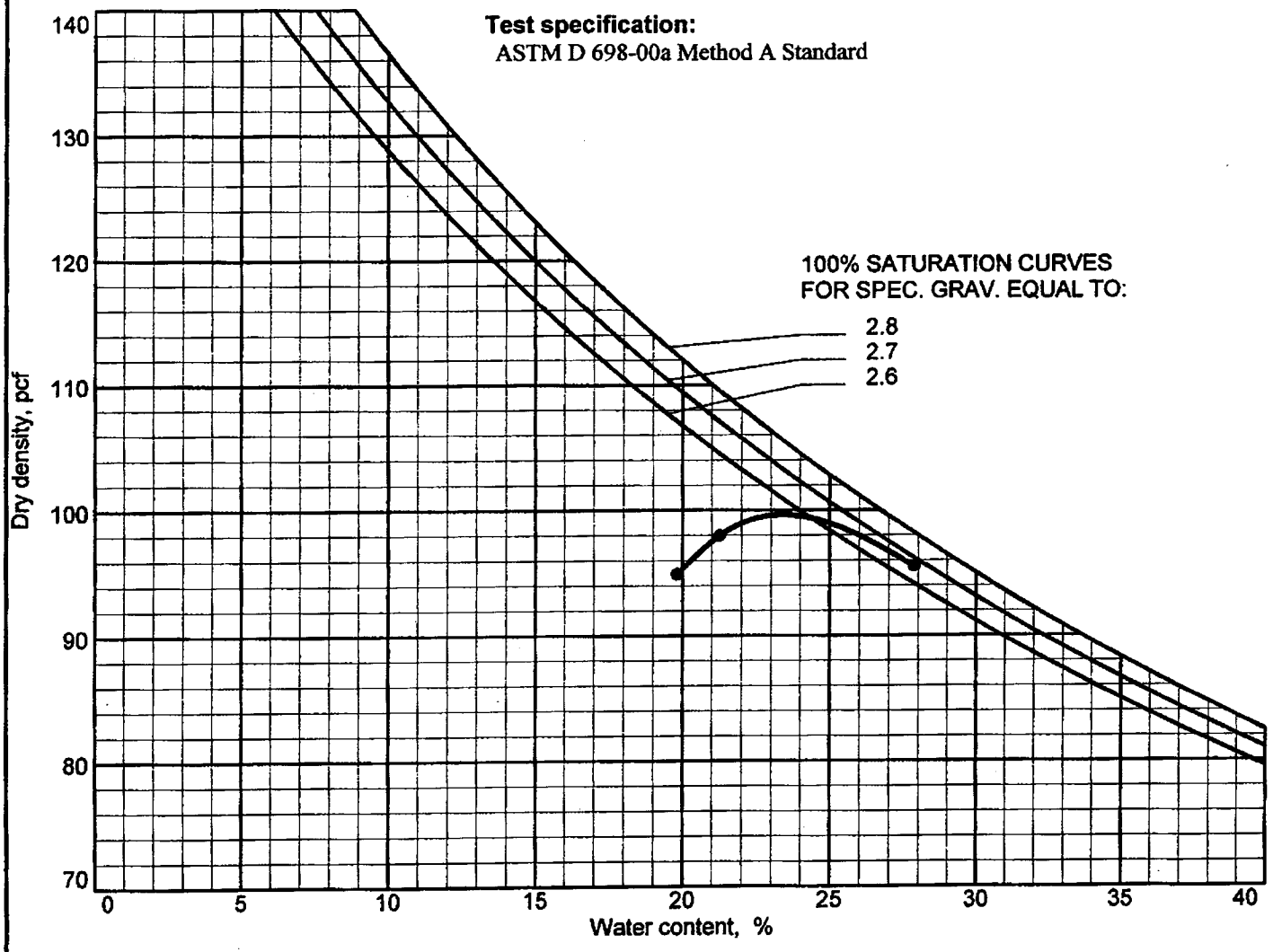
Nat. Moist. = 31.9 % **Sp.G. =** 2.68

Liquid Limit = 54 **Plasticity Index =** 26

% > No.4 = 2.0 % **% < No.200 =** 83.8 %

TEST RESULTS
Maximum dry density = 99 pcf
Optimum moisture = 23 %

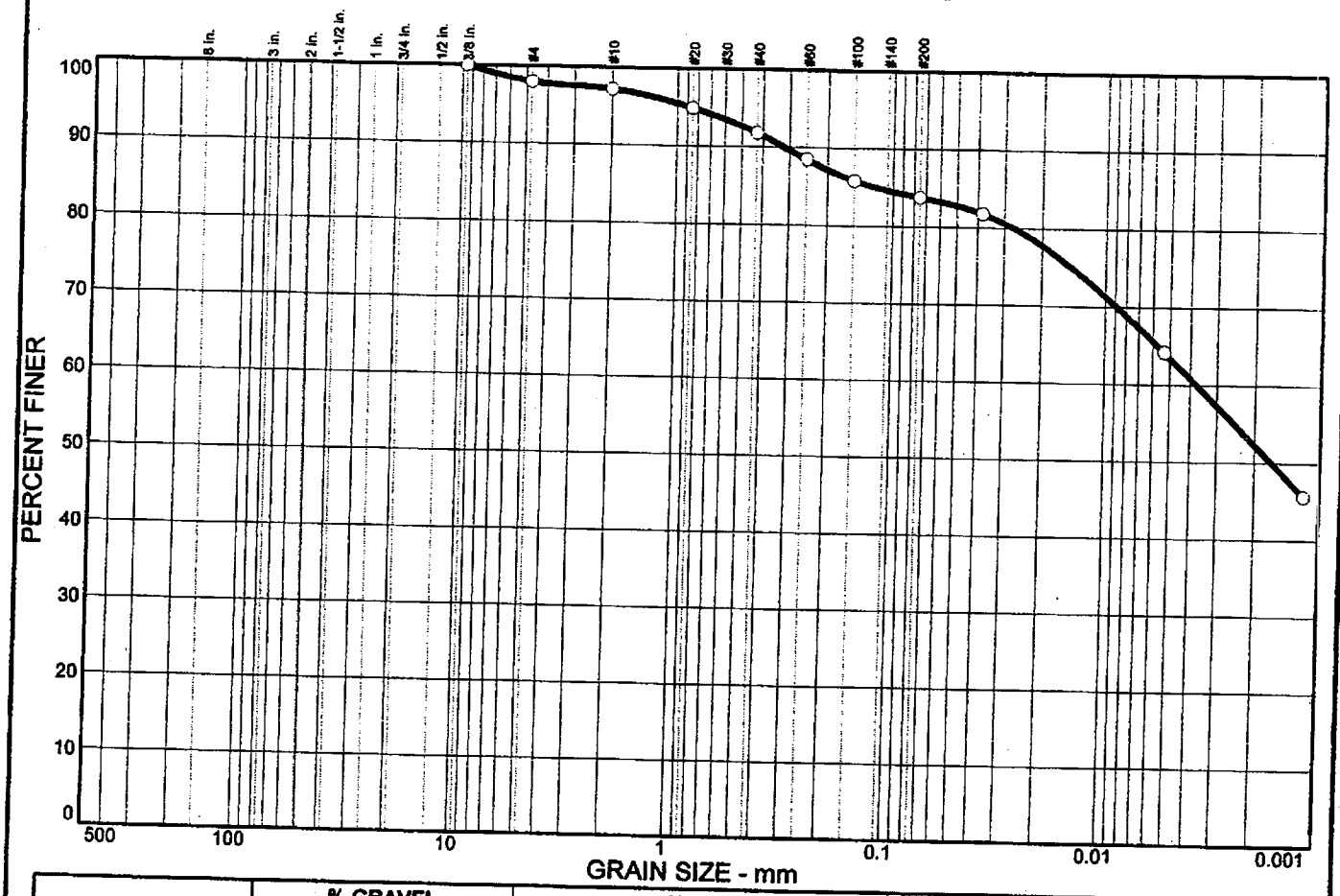
Test specification:
ASTM D 698-00a Method A Standard



Plate

GREGG LABORATORIES, INC.

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	2.0	0.8	5.4	8.0	20.3	63.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	98.0		
#10	97.2		
#20	94.9		
#40	91.8		
#60	88.5		
#100	85.8		
#200	83.8		

* (no specification provided)

Soil Description

BROWN TO YELLOW/BROWN, DAMP, HIGH PLASTICITY, STIFF FAT CLAY (CH) WITH SAND (PHOSPHATE NODULES), A-7-6(24).

Atterberg Limits

PL= 28 LL= 54 PI= 26

Coefficients

D_{85}= 0.120 D_{60}= 0.0037 D_{50}= 0.0017
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(24)

Remarks

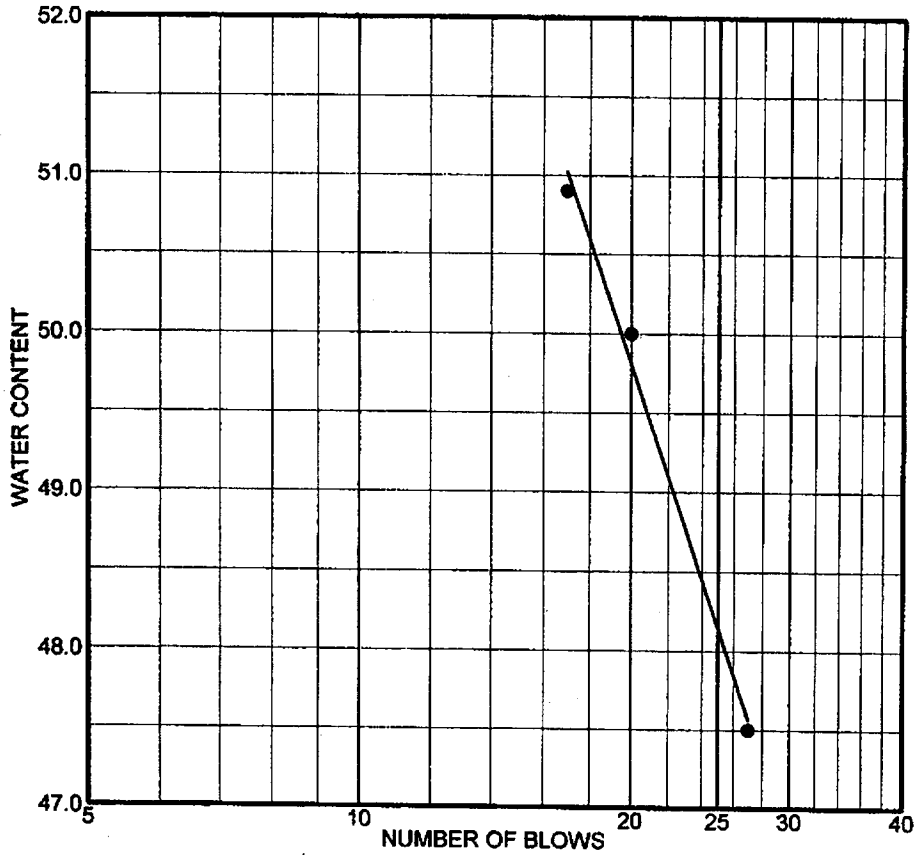
PARK VIEW AVE. STA.4+58.2, 13.2' RT. C.L.
LAB #13904
F.M.=0.16

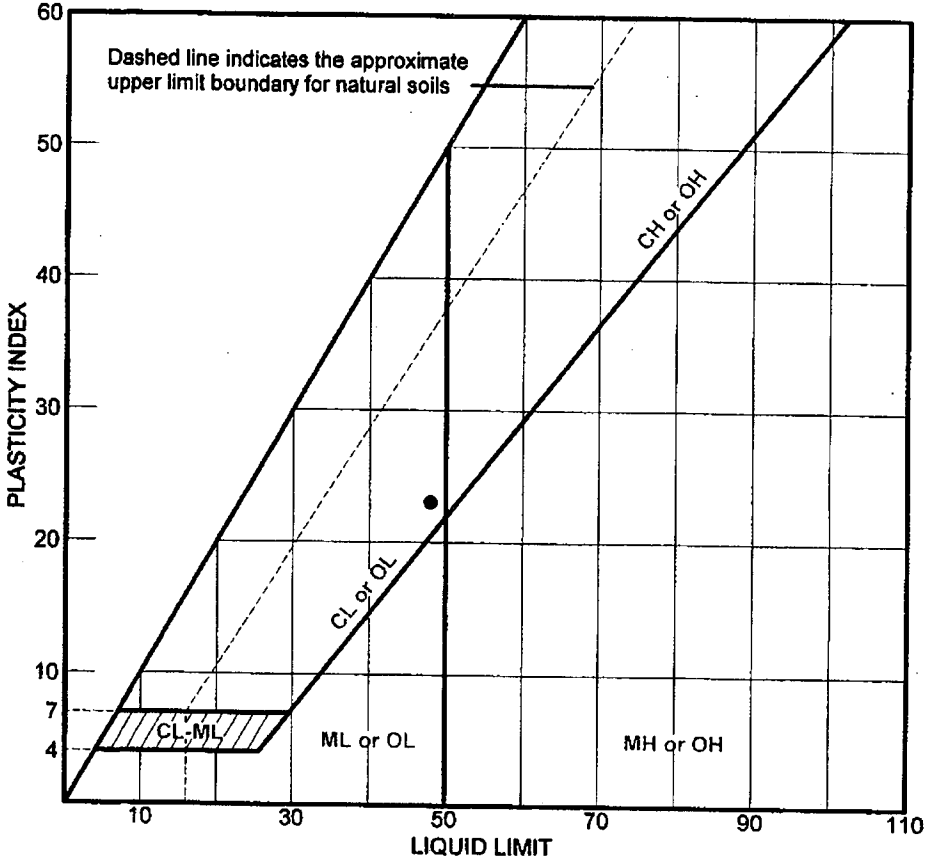
Sample No.: 13904 **Source of Sample:** PARK VIEW AVE. STA.4+58.2, 13.2' RT. C **Date:** 8-22-02
Location: **Elev./Depth:** 0.9'-3.7'

GREGG LABORATORIES, INC.

Client: SHERMAN CARTER BARNHART, PSC
Project: MEADOWS-NORTHLAND-ARLINGTON NEIGHBORHOOD IMPROVEMENT PROJECT
Project No: 2095 **Plate**

LIQUID AND PLASTIC LIMITS TEST REPORT





	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PI
●	PARK VIEW AVE., STA.12+89.6, 9.5' RT. C.L.	13903	0.7'-3.7'	8-22-02	CL	BROWN TO DARK BROWN, DAMP, HIGH PLASTICITY, MEDIUM, SANDY LEAN CLAY (CL) WITH GRAVEL (CRUSHED AGGREGATE LIMESTONE), A-7-6(10).	24.2	48	23

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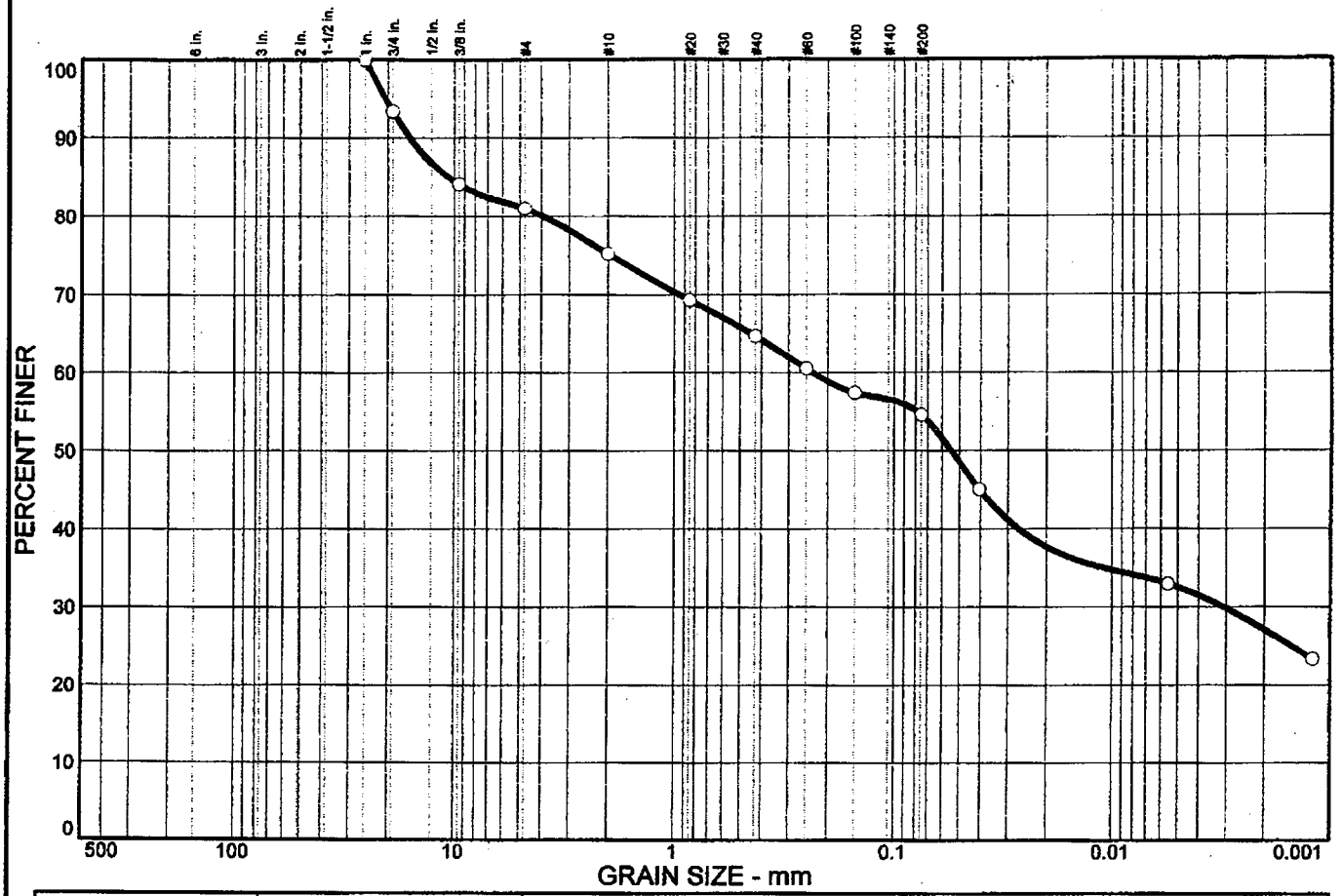
● PARK VIEW AVE. STA.12+89.6, 9.5' RT. C.L.
LAB #13903

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	6.6	12.4	5.8	10.5	10.1	22.0	32.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	93.4		
.375 in.	84.1		
#4	81.0		
#10	75.2		
#20	69.3		
#40	64.7		
#60	60.5		
#100	57.4		
#200	54.6		

* (no specification provided)

Soil Description

BROWN TO DARK BROWN, DAMP, HIGH PLASTICITY, MEDIUM, SANDY LEAN CLAY (CL) WITH GRAVEL (CRUSHED AGGREGATE LIMESTONE), A-7-6(10).

Atterberg Limits

PL= 25 LL= 48 PI= 23

Coefficients

D_{85}= 10.7 D_{60}= 0.234 D_{50}= 0.0542
D_{30}= 0.0031 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(10)

Remarks

PARK VIEW AVE. STA.12+89.6, 9.5' RT. C.L.
LAB #13903
F.M.=0.84

Sample No.: 13903 **Source of Sample:** PARK VIEW AVE., STA.12+89.6, 9.5' RT. **Date:** 8-22-02
Location: **Elev./Depth:** 0.7'-3.7'

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