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REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS

FOR BIDS AND CONTRACTS IN GENERAL:

- I. Each bidder or offeror swears and affirms under penalty of perjury, that:
 - a. In accordance with [KRS 45A.110](#) and [KRS 45A.115](#), neither the bidder or offeror as defined in [KRS 45A.070\(6\)](#), nor the entity which he/she represents, has knowingly violated any provisions of the campaign finance laws of the Commonwealth of Kentucky; and the award of a contract to the bidder or offeror or the entity which he/she represents will not violate any provisions of the campaign finance laws of the Commonwealth.
 - b. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and all subcontractors therein, are aware of the requirements and penalties outlined in [KRS 45A.485](#); have properly disclosed all information required by this statute; and will continue to comply with such requirements for the duration of any contract awarded.
 - c. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and its affiliates, are duly registered with the Kentucky Department of Revenue to collect and remit the sales and use tax imposed by [KRS Chapter 139](#), and will remain registered for the duration of any contract awarded.
 - d. The bidder or offeror swears and affirms under penalty of perjury that the entity bidding is not delinquent on any state taxes or fees owed to the Commonwealth of Kentucky and will remain in good standing for the duration of any contract awarded.

FOR “NON-BID” CONTRACTS (I.E. SOLE-SOURCE; NOT-PRACTICAL OR FEASIBLE TO BID; OR EMERGENCY CONTRACTS, ETC):

- II. Each contractor further swears and affirms under penalty of perjury, that:
 - a. In accordance with [KRS 121.056](#), and if this is a non-bid contract, neither the contractor, nor any member of his/her immediate family having an interest of 10% or more in any business entity involved in the performance of any contract awarded, have contributed more than the amount specified in [KRS 121.150](#) to the campaign of the gubernatorial slate elected in the election last preceding the date of contract award.
 - b. In accordance with [KRS 121.330\(1\) and \(2\)](#), and if this is a non-bid contract, neither the contractor, nor officers or employees of the contractor or any entity affiliated with the contractor, nor the spouses of officers or employees of the contractor or any entity affiliated with the contractor, have knowingly contributed more than \$5,000 in aggregate to the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract award.

Solicitation/Contract #: _____

REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS

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- c. In accordance with [KRS 121.330\(3\) and \(4\)](#), and if this is a non-bid contract, to the best of his/her knowledge, neither the contractor, nor any member of his/her immediate family, his/her employer, or his/her employees, or any entity affiliated with any of these entities or individuals, have directly solicited contributions in excess of \$30,000 in the aggregate for the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract.

As a duly authorized representative for the bidder, offeror, or contractor, I have fully informed myself regarding the accuracy of all statements made in this affidavit, and acknowledge that the Commonwealth is reasonably relying upon these statements, in making a decision for contract award and any failure to accurately disclose such information may result in contract termination, repayment of funds and other available remedies under law.

Signature

Printed Name

Title

Date

Company Name _____

Address _____

Subscribed and sworn to before me by _____
(Affiant) (Title)

of _____ this _____ day of _____, 20____.
(Company Name)

Notary Public

[seal of notary]

My commission expires: _____

**KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

**EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)**

**AN ACT OF THE KENTUCKY GENERAL ASSEMBLY
TO PREVENT DISCRIMINATION IN EMPLOYMENT**

**KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972**

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy). The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age (between forty and seventy), in admission to, or employment in any program established to

provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

REVISED: 12-3-92

EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (6) provides:

No present or former public servant shall, within six (6) months of following termination of his office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with the state in matters in which he was directly involved during his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved in state government. This subsection shall not prohibit the performance of ministerial functions, including, but not limited to, filing tax returns, filing applications for permits or licenses, or filing incorporation papers.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

PROVISIONS RELATIVE TO KRS 45A.485

During the performance of the contract, the contractor agrees to comply with applicable provisions of:

1. KRS 136 Corporation and Utility Tax
2. KRS 139 Sales and Use Taxes
3. KRS 141 Income Taxes
4. KRS 337 Wages and Hours
5. KRS 338 Occupational Safety and Health of Employees
6. KRS 341 Unemployment Compensation
7. KRS 342 Workers Compensation

Any final determinations of a violation by the contractor within the previous five (5) years pursuant to the applicable statutes above are revealed as follows:

NON-COLLUSION CERTIFICATION

COMMONWEALTH OF KENTUCKY

COUNTY

PROJECT NO.

I, (Name of officer signing certification) (Title) under penalty of perjury under the laws of the United States, do hereby certify that

(Name of Individual, Co-Partnership, or Corporation submitting bid)

its agent, officers or employees have not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding in connection with this proposal.

(Signature) (Title)

NON-COLLUSION CERTIFICATION

COMMONWEALTH OF KENTUCKY

COUNTY

PROJECT NO.

I, (Name of officer signing certification) (Title) under penalty of perjury under the laws of the United States, do hereby certify that

(Name of Individual, Co-Partnership, or Corporation submitting bid)

its agent, officers or employees have not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding in connection with this proposal.

(Signature) (Title)

CERTIFICATION OF ORGANIZATION(S)

COMMONWEALTH OF KENTUCKY

COUNTY

PROJECT NO.

I, (Name of Officer or Authorized Agent) (Title)

under penalty of perjury under the laws of the United States, do hereby certify that, except as noted below,

(Name of Individual, Co-Partnership, or Corporation submitting bid)

any person associated therewith in the capacity of (owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the Administration of Federal Funds): is not currently under suspension, debarment, voluntarily exclusion, or determination of ineligibility by any federal agency; has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years; does not have a proposed debarment pending; and has not been indicted, convicted, or had a civil judgement rendered against (it) by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

Please list below any exceptions to the foregoing, to whom it applies, initiating agency and dates of action.

Exceptions:

(Signature)

(Title)

CERTIFICATION OF PERFORMANCE

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports.

The _____, hereby certifies that he _____, participated in previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that he _____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the Former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

(Name of Individual, Co-Partnership, or Corporation submitting bid)

(Name of Officer or Authorized Agent)

(Title)

(Signature)

Date:

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by bidders and proposed subcontractors only in connection with the contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EE0-1) is the only report required by the Executive Orders of their implementing regulation.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

CERTIFICATION FOR FEDERAL-AID CONTRACT

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agent.
2. If any funds other than the Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participation also agrees by submitting his or her bid proposal that he or she shall require the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

(Name of Individual, Co-Partnership, or Corporation submitting bid)

(Name of Officer or Authorized Agent)

(Title)

(Signature)

CERTIFICATION OF BID PROPOSAL / DBE

We (I) proposed to furnish all labor, equipment and materials necessary to construct and/or improve the subject project in accordance with the plans, proposal, the Transportation Cabinet's Standard Specifications for Road and Bridge Construction, current edition, special provisions, notes applicable to the project as indicated herein and all addenda issued on this project.

We (I) attach a bid guaranty as provided in the special provisions in an amount not less than 5% of the total bid. We agree to execute a contract in accordance with this proposal within 15 calendar days after the receipt of the notice of award for the project.

We (I) have examined the site of proposed work, project plans, specifications, special provisions, and notes applicable to the project referred to herein. We understand that the quantities shown herein are estimated quantities subject to increase or decrease as provided in the specifications.

We (I) acknowledge receipt of all addendum(s) and review of all posted questions and answers (if applicable) and have made necessary revisions to the bid proposal. We have considered all addendum(s) and posted Questions and answers in calculation of the submitted bid and applied the updated bid items, which are included.

"The bidder certifies that it has secured participation by Disadvantaged Business Enterprises(DBE) in amount of - - percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program."

For Electronic Bidding - We (I) certify by signing this bid with a digital signature, which is considered a valid binding signature, all documents contained in the Bid Packet produced by the Expedite Bidding Program.

(Name of Individual, Co-Partnership, or Corporation submitting bid)

(Name of Officer of Authorized Agent)

Title

(Signature)

When two or more organizations bid as a joint venture, enter names of each organization and an authorized agent for each organization must sign above.

APPENDIX A

**Pavement Design Folder
I-69
Item No. 2-225.00
Hopkins County, Kentucky**



Prepared for:
Kentucky Transportation Cabinet



Prepared by:
Palmer Engineering

September 2013

I-69 – Hopkins County, KY

Pavement Folder

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I-69 Pavement Folder, Typical Sections and Details.....6

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Pavement Folder Introduction

This folder documents the process for the development of a new pavement design along I-69 at the Pennyrile Parkway in Hopkins County. The pavement design will be used on the new mainline construction of I-69. Traffic and ESAL calculations were provided for the preferred alternate and can be found following the pavement designs. 44,400,000 ESALs were used for developing the pavement design.

A geotechnical report was not available for the project. Pavements were designed for a CBR 2, with 2 options for subgrade stabilization. Subgrade stabilization shall be at the contractor's option and will be either 16" of rock and fabric stabilization or 12" of cement stabilized roadbed (6% Portland cement by dry weight).

The Kentucky Transportation Cabinet's Pavement Design Curves was used to determine the necessary pavement thickness for the 44.4 Million ESAL design segment. Total thickness requirements were computed for a range of design requirements (33%, 50%, and 75%) for a CBR 2. Structural numbers were estimated for each range based on the various thicknesses. Typical KYTC layer coefficients were used for calculations. The following tables list the depths and associated structural numbers for the various ranges computed using this program.

| CBR 2 | | | |
|---------------------|---------------------------------|-----------------------------------|---------------------|
| Design Range | Total Thickness Required | Asphalt Thickness Required | Estimated SN |
| 33% | 39.72 | 13.11 | 9.02 |
| 50% | 31.64 | 15.82 | 8.59 |
| 75% | 24.05 | 18.04 | 8.11 |

A 75% design curve was selected, and a pavement design that would meet a structural number of 8.11 was designed. The pavement was designed using the most current KYTC Pavement Design Spreadsheet (V. 5.05).

The new pavement design will be constructed next to an existing pavement, so development of the design took constructability into consideration. The I-69 existing pavement designs follow:

EXISTING

1.5" Surface

7.75" Base

9" PCC

4" Aggregate

The existing lanes will be milled and overlaid with 1.5" of asphalt surface.

The mainline pavement design (with options for roadbed stabilization) for this 44.4 Million ESAL segment, with a structural number of 8.11 (CBR 2) follows:

OPTION 1: 16" ROCK & FABRIC

1.50" CL 4 Asphalt Surface 0.5A PG 76-22
3.50" CL 4 Asphalt Base 1.0D PG 76-22
3.50" CL 4 Asphalt Base 1.0D PG 64-22
4.00" CL 4 Asphalt Base 1.0D PG 64-22
4.00" Drainage Blanket – Type II – Asphalt
6.00" DGA Base
16.00" Rock and Type IV Filter Fabric

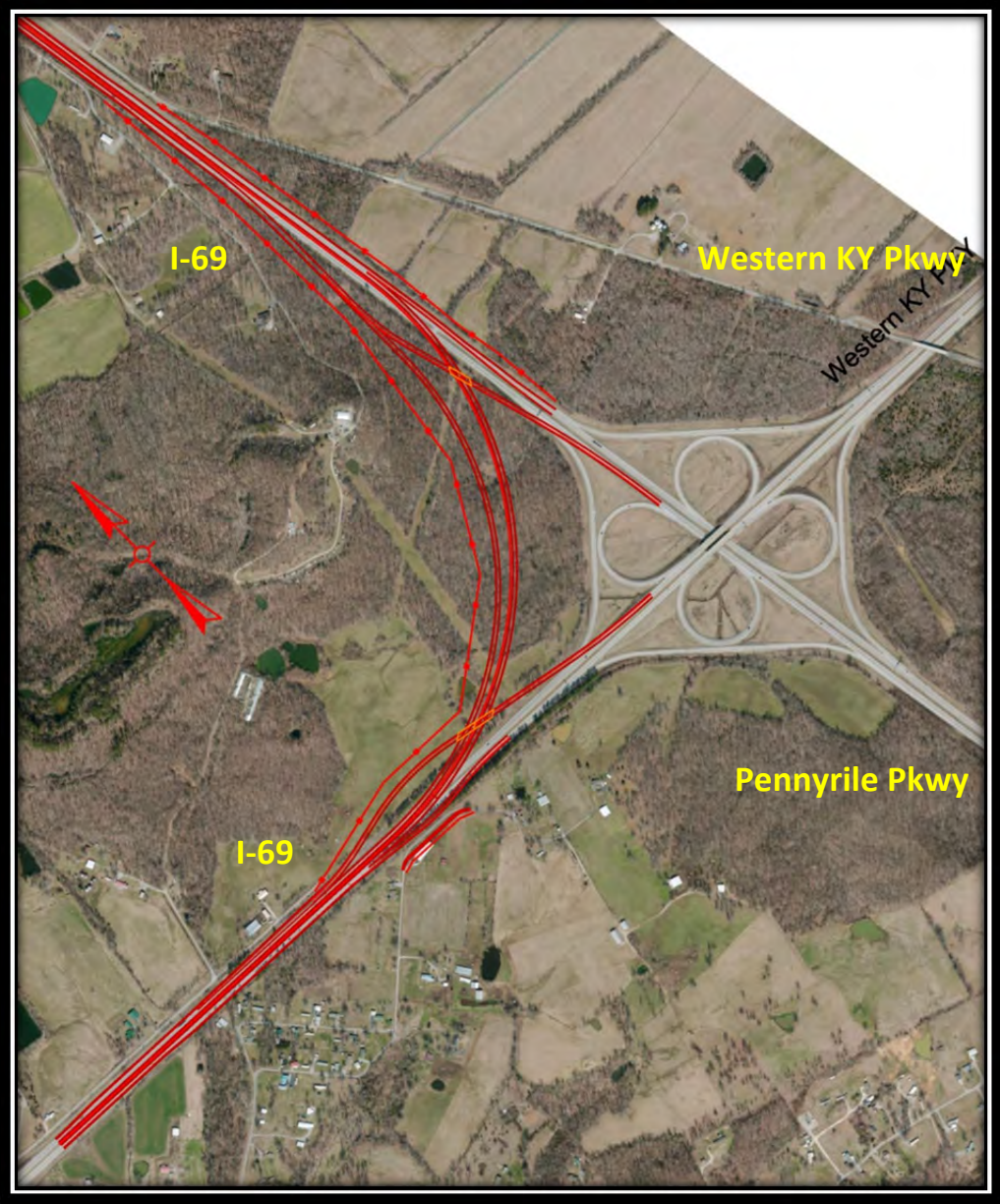
OPTION 2: 12" CEMENT STABILIZED ROADBED

1.50" CL 4 Asphalt Surface 0.5A PG 76-22
3.50" CL 4 Asphalt Base 1.0D PG 76-22
3.50" CL 4 Asphalt Base 1.0D PG 64-22
4.00" CL 4 Asphalt Base 1.0D PG 64-22
4.00" Drainage Blanket—Type II—Asphalt
6.00" DGA Base
12.00" Cement Stabilized Roadbed

The above Option 1 (16" rock and fabric stabilized subgrade) design has a structural number of 8.02 while Option 2 (12" cement stabilized roadbed) design has a structural number of 8.06. Subgrade stabilization will be contractor option.

The following notes will also apply:

- Subgrade stabilization (rock and fabric or cement) shall extend from shoulder break to shoulder break on all typical sections requiring treatment.
- Asphalt seal required from outside edge of paved shoulders to a point two feet down the ditch or fill slope. Two applications of the following:
 - Asphalt Curing Seal 2.4 lb/sq yd
 - Asphalt Seal Aggregate 20 lb/sq yd
- The Material Transfer Vehicle (MTV) will be required for placement of all asphalt base and surface courses on mainline. The MTV will also be required on all system ramps unless waived by the Engineer due to constructability issues.
- In sections with guardrail, asphalt pavement shall extend to the face of the guardrail.



I-69 Pavement Folder & Typical Sections

Kentucky Curves

Aug 5 2013

Project Item No. : 2-225.00



County:

Route: I-69

CBR: 2

ESALs: 44,400,000



| | 33% | 50% | 75% |
|----------------------------------|-------------|-------------|-------------|
| Asphalt: | 13.11" | 15.82" | 18.04" |
| DGA: | 26.62" | 15.82" | 6.01" |
| Total Thickness: | 39.72" | 31.64" | 24.05" |
| Equivalent Asphalt on 4" DGA: | 21.02" | 19.96" | 18.74" |
| Structural Number: | 9.02 | 8.59 | 8.11 |

KENTUCKY TRANSPORTATION CABINET



PAVEMENT DESIGN FOLDER



County Hopkins Item No. 2-225.00 UPN N/A

Road I-69 Route No. I-69

Sta. to Sta. 1009+50 to 1099+60 MP to MP NEW to ROUTE

Consultant Palmer Engineering Project Length 2.1 miles

Pavement Type Selection

Alternate Bid

Asphalt: Max Asphalt Max Aggregate

Concrete

Design ESAL's 44,400,000

Current Letting Date December 2013

DOCUMENTATION

- | | |
|--|--|
| <input checked="" type="checkbox"/> Design Executive Summary | <input checked="" type="checkbox"/> Typical Sections and Details |
| <input checked="" type="checkbox"/> Pavement Design TC61-29 | <input type="checkbox"/> Comparison of Alternatives |
| <input type="checkbox"/> Special Notes and Provisions | <input type="checkbox"/> Initial Cost |
| <input type="checkbox"/> Type Selection Summary | <input type="checkbox"/> Life Cycle Cost |
| <input type="checkbox"/> Geotechnical Information | <input type="checkbox"/> Other Documentation |
| <input checked="" type="checkbox"/> Traffic Information | List: |

SUBMITTED: Ashley McLain, PE, PTOE Designer Date: 3-Sep

Project Description: 2-225.00 I-69 Hopkins County I-69
 Analysis Date: 8/1/2013

Note: Fields in yellow require user input. Fields in orange allow user input. Material type selection lists may be edited in the "Bid Items" Worksheet

Structural Design Inputs

Design CBR: 2
 Design ESAL's: 44,400,000
 Construction Year ADT: []
 Construction Year Truck Percentage: []
 Design Life (years): []
 Analysis Period (years): []
 Check if User will define layer thickness:
 Subgrade stabilization: Lime None Cement Rock & Fabric
 Stabilization Thickness = 12 inches (Default thickness is 8 inches for lime/cement and 12 inches for rock)

Length of Project (miles): 2.1
 Total Number of Lanes, One Direction: []
 Lane Width (feet): [] (Width of individual lane)
 Number of Directions (1 or 2): []
 Inside Paved Shoulder width (feet): []
 Outside Paved Shoulder width (feet): []
 Length of Initial Construction (Default 120 days): 120
 Daily User Cost (\$): 0

Pavement Structural Design From Design Catalog

Required Structural Number: 8.11 (Designed Pavement structure should satisfy Required Structural Number to within +/- 0.05)
 Required JPC Pavement Thickness: #N/A (Minimum Concrete Pavement Thickness is 8 inches)

Unit Costs for this project were provided by the Engineering Estimating Section

NOTE: Verify material types for each design to insure the cost calculations are correct.

Maximum Asphalt Design

| | Default Layer Thickness (in.) | | | | User Defined Thickness (in.) | | | Final Design Thickness (in.) | | |
|--------------------------------|-------------------------------|----|---------|----|------------------------------|----------|------|------------------------------|----------|------|
| | Design | SN | Nominal | SN | Mainline | Shoulder | SN | Mainline | Shoulder | SN |
| Surface | | | | | 1.50 | 1.50 | 0.66 | 1.50 | 1.50 | 0.66 |
| Base Total (in) 6.1 | | | | | | | | | | |
| Layer 1 | | | | | 3.50 | 3.50 | 1.40 | 3.00 | 3.00 | 1.20 |
| Layer 2 | | | | | 3.50 | 3.50 | 1.40 | 3.00 | 3.00 | 1.20 |
| Layer 3 | | | | | 4.00 | | 1.60 | 4.00 | 4.00 | 1.60 |
| Layer 4 | | | | | | | 0.00 | 4.50 | 4.50 | 1.80 |
| Drainage Blanket-Ty II-Asphalt | | | | | 4.00 | | 0.84 | 4.50 | 0.00 | 0.95 |
| DGA | | | | | 6.00 | 14.00 | 0.84 | 4.00 | 4.00 | 0.56 |
| Stabilized Roadbed | | | | | 12.00 | 12.00 | 1.32 | 12.00 | 12.00 | 0.96 |
| | | | | | Total SN | | 8.06 | Total SN | | 8.93 |

Maximum Asphalt Design

| Driving Lane Material Selection | | | | Shoulder Material Selection | | | |
|---------------------------------|-----------------------------------|-----------|-----------|------------------------------|-----------|------|------------------------------------|
| Item Code | Description | Unit Cost | Item Code | Description | Unit Cost | #N/A | #N/A lowest initial cost alternate |
| 335 | CL 4 ASPH SURF 0.5A PG76-22 | 75.94 | 312 | CL 3 ASPH SURF 0.5D PG64-22 | 61.66 | | |
| 219 | CL 4 ASPH BASE 1.00D PG76-22 | 54.62 | 214 | CL 3 ASPH BASE 1.00D PG64-22 | 54.43 | | |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 47.36 | 214 | CL 3 ASPH BASE 1.00D PG64-22 | 54.43 | | |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 47.36 | | | | | |
| 18 | Drainage Blanket - Type II - Asph | 40.00 | | | | | |
| 1 | DGA | 17.50 | 1 | DGA | 17.50 | | |
| 8 | Cement Stabilized Roadbed | 2.00 | 8 | Cement Stabilized Roadbed | 2.00 | | |

Maximum Aggregate Design

| | Default Layer Thickness (in.) | | | | User Defined Thickness (in.) | | | Final Design Thickness (in.) | | |
|--------------------------------|-------------------------------|----|---------|----|------------------------------|----------|----|------------------------------|----------|----|
| | Design | SN | Nominal | SN | Mainline | Shoulder | SN | Mainline | Shoulder | SN |
| Surface | | | | | | | | | | |
| Base Total (in) 6.3 | | | | | | | | | | |
| Layer 1 | | | | | | | | | | |
| Layer 2 | | | | | | | | | | |
| Layer 3 | | | | | | | | | | |
| Layer 4 | | | | | | | | | | |
| Drainage Blanket-Ty II-Asphalt | | | | | | | | | | |
| DGA | | | | | | | | | | |
| Stabilized Roadbed | | | | | | | | | | |
| | | | | | Total SN | | | Total SN | | |

Maximum Aggregate Design

| Item Code | Description | Unit Cost | #N/A | #N/A lowest initial cost alternate |
|-----------|-------------|-----------|------|------------------------------------|
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Concrete Pavement Design

| | Default Layer Thickness (in.) | | | | User Defined Thickness (in.) | | | Final Design Thickness (in.) | | |
|-------------------------------|-------------------------------|----|---------|----|------------------------------|----------|----|------------------------------|----------|----|
| | Design | SN | Nominal | SN | Mainline | Shoulder | SN | Mainline | Shoulder | SN |
| JPC Pavement Thickness (in) | | | | | | | | | | |
| AC Shoulder Surface | | | | | | | | | | |
| AC Shoulder Base | | | | | | | | | | |
| Layer 1 | | | | | | | | | | |
| Layer 2 | | | | | | | | | | |
| Layer 3 | | | | | | | | | | |
| Layer 4 | | | | | | | | | | |
| JPC Pavement Drainage Blanket | | | | | | | | | | |
| Crushed Stone Base | | | | | | | | | | |
| Stabilized Roadbed | | | | | | | | | | |

Concrete Pavement Design

| Item Code | Description | Unit Cost | #N/A | #N/A lowest initial cost alternate |
|-----------|--------------------------|-----------|------|------------------------------------|
| | JPC Shoulder | | | |
| | Asphalt Shoulder Surface | | | |
| | Asphalt Shoulder Base | | | |
| | Layer 1 | | | |
| | Layer 2 | | | |
| | Layer 3 | | | |
| | Layer 4 | | | |
| | Drainage Blanket | | | |
| | Aggregate Base | | | |
| | Stab. Roadbed | | | |

DATE: 8/1/2013

I. PROJECT INFORMATION

Item No: 2-225.00 **County:** Hopkins

Route: I-69

Project Length: 2.1 miles

Letting: Dec 2013

- Alternative 1: Asphalt Pavement
- Alternative 2: Concrete Pavement
- Alternative 3: Alternate Pavement Bidding

Alternative Selected: _____

State Highway Engineer

Date

**Pavement Design ESALs
 & Off the National Highway System**

County Hopkins Item 2-225.00 UPN N/A
 Road Name I-69 F.P. _____
 Description I-69 CONSTRUCTION NEAR WESTERN KENTUCKY/PENNYRILE
PARKWAY INTERCHANGE

Traffic 10,400 2013 15,500 2040 ESAL 44,400,000 20-yr
 Existing: Type AC OVER PCC Thickness 22.75" NB, 21.5" SB
 Length 2.10 Miles Design Speed 70 M.P.H. Design CBR 2

Note: ASSUMED

FOR TYPICAL SECTION SEE ATTACHED SHEET(S)

**Option 1: 16" Rock & Fabric Roadbed
 ROADBED PREPARATION**

| | | |
|------|------------------------------|-------|
| 2599 | FABRIC-GEOTEXTILE TYPE IV | SQ YD |
| 78 | CRUSHED AGGREGATE SIZE NO. 2 | TON |

PAVEMENT

Traffic Lanes:

| | | | |
|-----|-----------------------------------|------|-------|
| 1 | DGA | 6" | depth |
| 18 | Drainage Blanket - Type II - Asph | 4" | depth |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 4" | depth |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 219 | CL 4 ASPH BASE 1.00D PG76-22 | 3.5" | depth |
| 335 | CL 4 ASPH SURF 0.5A PG76-22 | 1.5" | depth |

Shoulders:

| | | | |
|-----|------------------------------|------|-------|
| 1 | DGA | 14" | depth |
| 214 | CL 3 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 214 | CL 3 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 312 | CL 3 ASPH SURF 0.5D PG64-22 | 1.5" | depth |

Asphalt Seal required from outside edge of paved shoulder to a point 2 feet down the ditch or fill slope. Two applications of the following:

| | | |
|-----|------------------------|----------------------------|
| 103 | ASPHALT SEAL COAT | 2.40 lb/sy |
| 100 | ASPHALT SEAL AGGREGATE | 20 lb/sy (Size No.8 or 9M) |

**Option 2: 12" Cement Stabilized Roadbed
ROADBED PREPARATION**

| | | |
|------|---------------------------|--------------|
| 8 | Cement Stabilized Roadbed | SQ YD |
| 2542 | Cement | TON |
| 358 | Asphalt Curing Seal | 2.0 LB/SY YD |
| 2702 | Sand for Blotter | 5.0 LB/SQ YD |

Traffic Lanes:

| | | | |
|-----|-----------------------------------|------|-------|
| 1 | DGA | 6" | depth |
| 18 | Drainage Blanket - Type II - Asph | 4" | depth |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 4" | depth |
| 217 | CL 4 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 219 | CL 4 ASPH BASE 1.00D PG76-22 | 3.5" | depth |
| 335 | CL 4 ASPH SURF 0.5A PG76-22 | 1.5" | depth |

Shoulders:

| | | | |
|-----|------------------------------|------|-------|
| 1 | DGA | 14" | depth |
| 214 | CL 3 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 214 | CL 3 ASPH BASE 1.00D PG64-22 | 3.5" | depth |
| 312 | CL 3 ASPH SURF 0.5D PG64-22 | 1.5" | depth |

Asphalt Seal required from outside edge of paved shoulder to a point 2 feet down the ditch or fill slope. Two applications of the following:

| | | |
|-----|------------------------|----------------------------|
| 103 | ASPHALT SEAL COAT | 2.40 lb/sy |
| 100 | ASPHALT SEAL AGGREGATE | 20 lb/sy (Size No.8 or 9M) |

SUBMITTED _____ DATE _____ Designer

RECOMMENDED _____ DATE _____ Project Manager

APPROVED _____ DATE _____ TEBM for Pavements

PLAN NOTE NO.:

- 444A Asphalt Pavement Ride Quality
- 447 Compaction of Asphalt Mixtures
- 275 Cement Stabilized Roadbed (12 in, CBR 2, 6%)

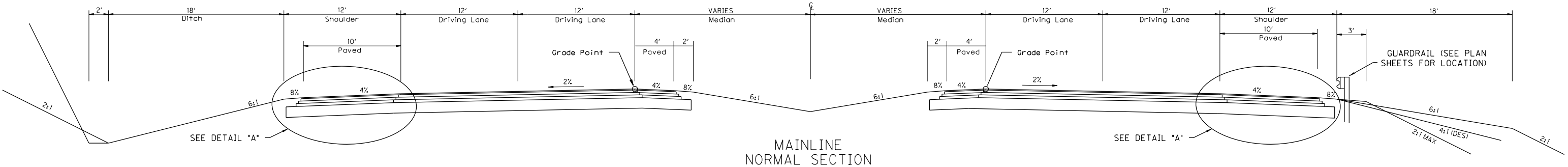
SPECIAL NOTE FOR:

SPECIAL PROVISION FOR:

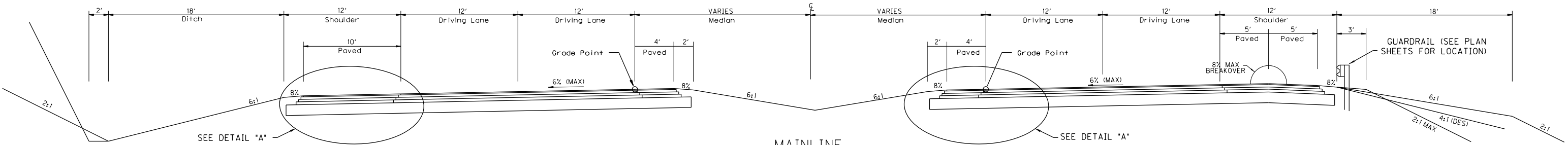
APPENDIX B

| | | |
|-----------|----------|-----------|
| COUNTY OF | ITEM NO. | SHEET NO. |
| HOPKINS | 2-225.00 | R2 |

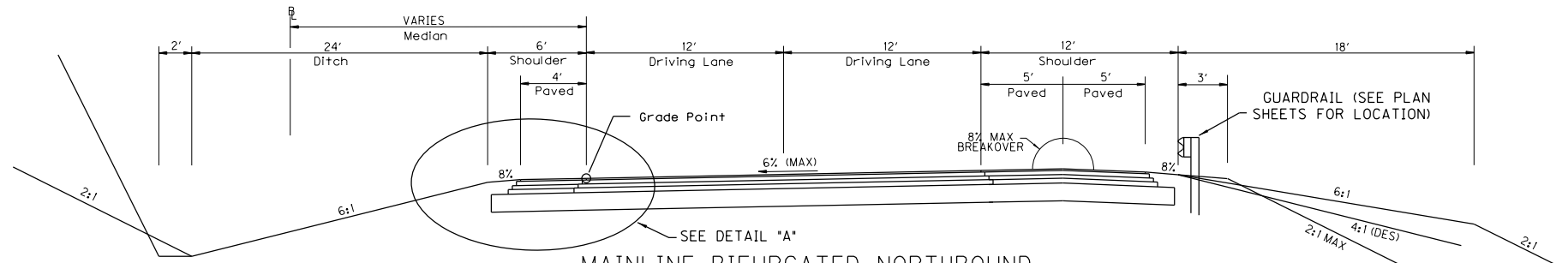
NOTE : FOR SLOPES BEYOND SHOULDERS
SEE CROSS SECTIONS



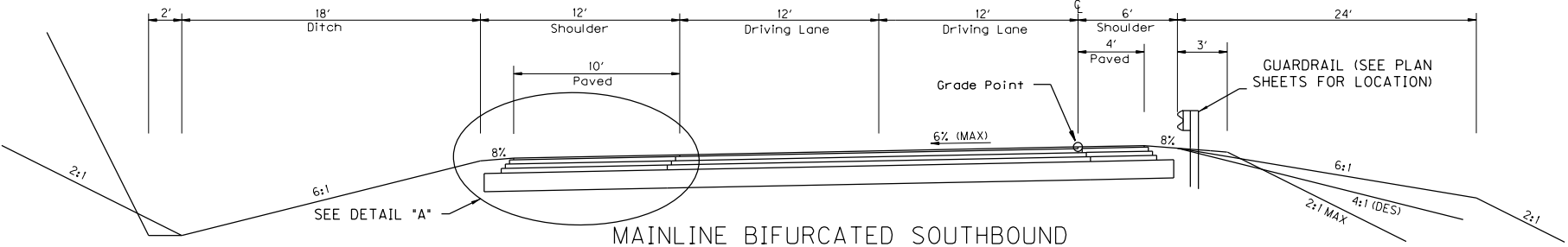
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NORMAL SECTION



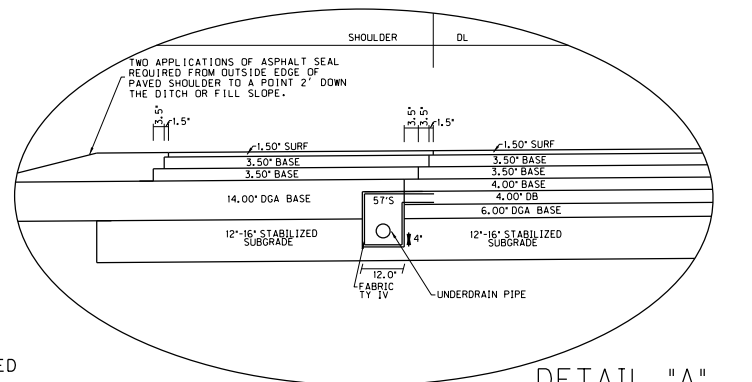
MAINLINE
SUPERELEVATED SECTION



MAINLINE BIFURCATED NORTHBOUND
SUPERELEVATED SECTION



MAINLINE BIFURCATED SOUTHBOUND
SUPERELEVATED SECTION



DETAIL "A"

- NEW CONSTRUCTION TRAFFIC LANES**
- 1.50" SURFACE — 1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
 - 21.00" BASE — 3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
 - 3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
 - 4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
 - 4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
 - 6.00" DEPTH DGA BASE
 - 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

- NEW CONSTRUCTION SHOULDERS**
- 1.50" SURFACE — 1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
 - 21.00" BASE — 3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
 - 3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
 - 14.00" DEPTH DGA BASE
 - 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

NOTE:
SUBGRADE STABILIZATION SHALL
BE AT THE CONTRACTOR'S OPTION

A) 16" OF ROCK (#2,3 OR 23) WRAPPED
IN TYPE IV FILER FABRIC

B) 12" CEMENT STABILIZED ROADBED
(6% PORTLAND CEMENT BY DRY WEIGHT)

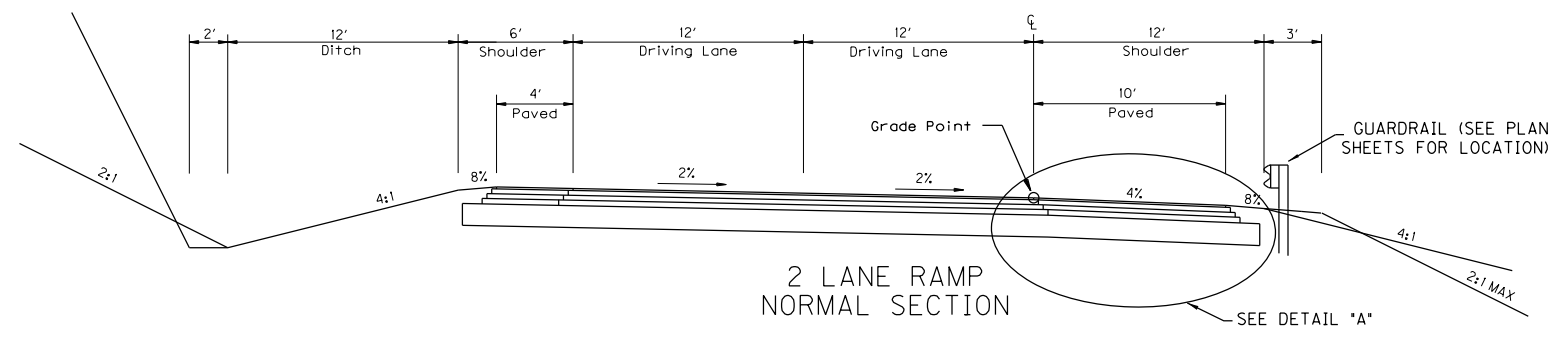
DESIGN SPEED
70 mph

I-69 INTERCHANGE @ PENNYRILE PKWY
TYPICAL SECTION

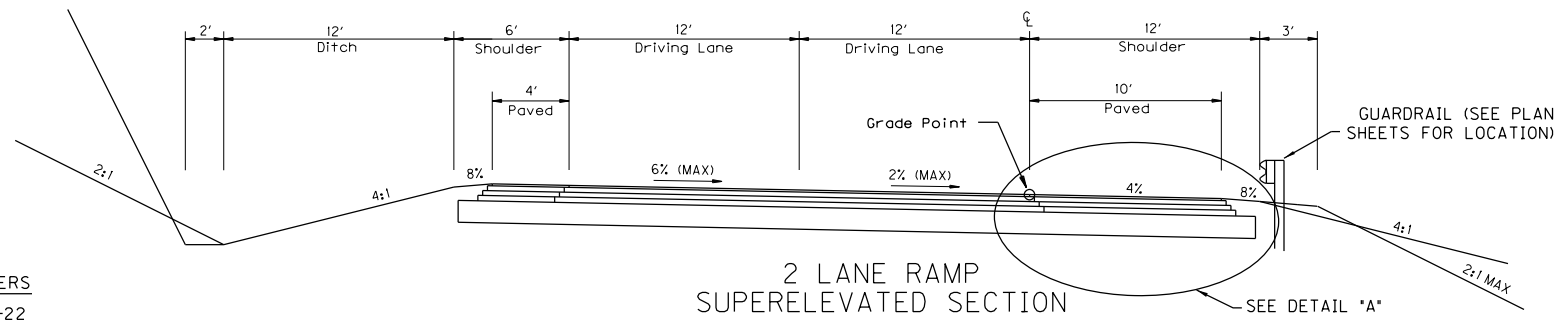
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 USER: sstephen
 DATE PLOTTED: September 4, 2013
 E-SHEET NAME:
 MicroStation v8.11.9.357

NOTE : FOR SLOPES BEYOND SHOULDERS
SEE CROSS SECTIONS

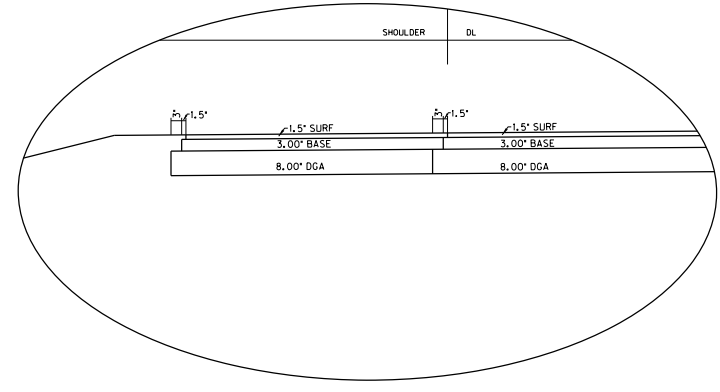


2 LANE RAMP
NORMAL SECTION

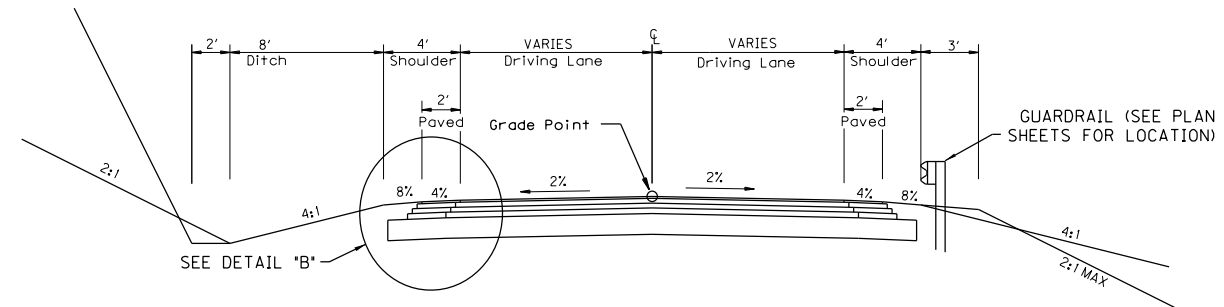


2 LANE RAMP
SUPERELEVATED SECTION

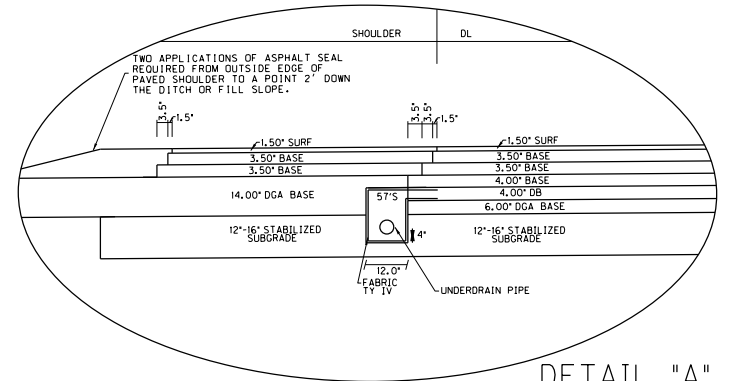
ACCESS / FRONTAGE ROAD TRAFFIC LANES AND SHOULDERS
1.50" SURFACE [1.50" DEPTH CLASS 2 ASPHALT SURFACE 0.5D PG 64-22
11.0" BASE [3.00" DEPTH CLASS 2 ASPHALT BASE 0.75D PG 64-22
[8.00" DEPTH DGA BASE



DETAIL "B"



ACCESS / FRONTAGE ROAD
NORMAL SECTION



DETAIL "A"

NEW CONSTRUCTION TRAFFIC LANES
1.50" SURFACE [1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
21.00" BASE [3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
[3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
[4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
[4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
[6.00" DEPTH DGA BASE
16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

NEW CONSTRUCTION SHOULDERS
1.50" SURFACE [1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
21.00" BASE [3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
[3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
[14.00" DEPTH DGA BASE
16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

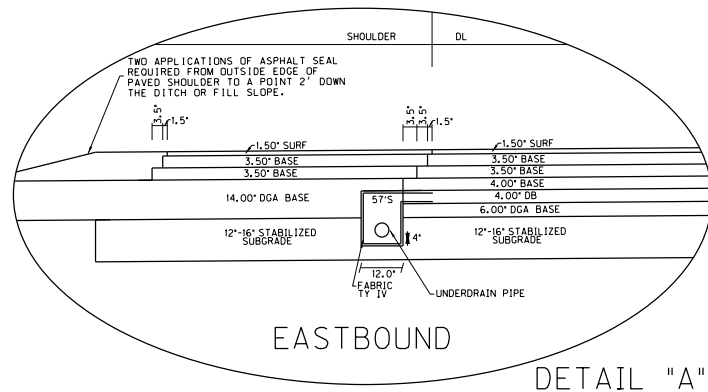
NOTE:
SUBGRADE STABILIZATION SHALL
BE AT THE CONTRACTOR'S OPTION
A) 16" OF ROCK (#2.3 OR 23) WRAPPED
IN TYPE IV FILTER FABRIC
B) 12" CEMENT STABILIZED ROADBED
(6% PORTLAND CEMENT BY DRY WEIGHT)

DESIGN SPEED
70 mph

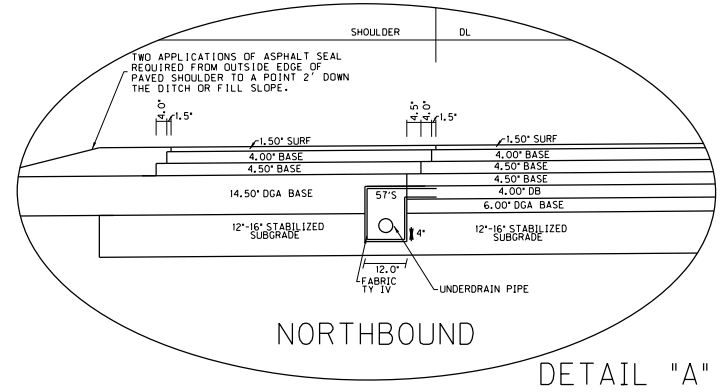
I-69 INTERCHANGE @ PENNYRILE PKWY
TYPICAL SECTION

SCALE: NTS

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 USER: sstephen
 DATE PLOTTED: September 4, 2013
 E-SHEET NAME:
 MicroStation v8.11.9.357



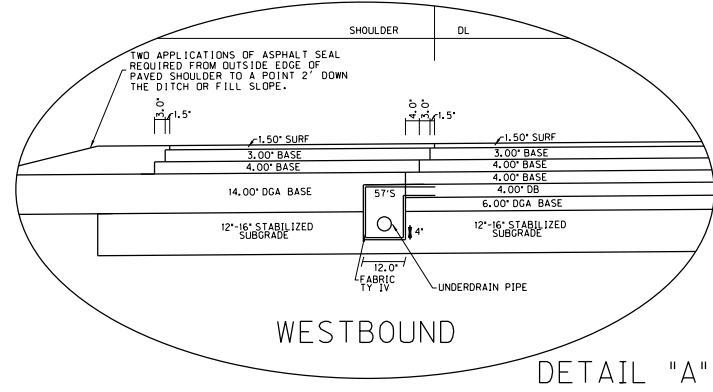
EASTBOUND
DETAIL "A"



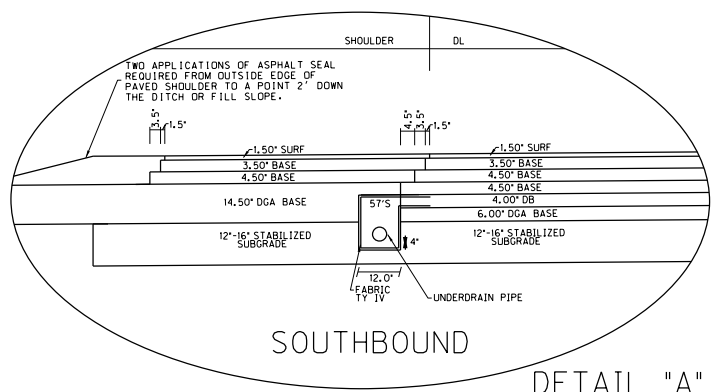
NORTHBOUND
DETAIL "A"

- EASTBOUND WKY PARKWAY WIDENING TRAFFIC LANES**
- 1.50" SURFACE — [1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
 - 21.00" BASE — [3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
6.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED
- EASTBOUND WKY PARKWAY WIDENING SHOULDERS**
- 1.50" SURFACE — [1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
 - 21.00" BASE — [3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
14.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

- NORTHBOUND PENNYRILE PARKWAY WIDENING TRAFFIC LANES**
- 1.50" SURFACE — [1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
 - 23.00" BASE — [4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
4.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
6.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED
- NORTHBOUND PENNYRILE PARKWAY WIDENING SHOULDERS**
- 1.50" SURFACE — [1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
 - 23.00" BASE — [4.00" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
4.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
14.50" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED



WESTBOUND
DETAIL "A"



SOUTHBOUND
DETAIL "A"

- WESTBOUND WKY PARKWAY WIDENING TRAFFIC LANES**
- 1.50" SURFACE — [1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
 - 21.00" BASE — [3.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
6.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED
- WESTBOUND WKY PARKWAY WIDENING SHOULDERS**
- 1.50" SURFACE — [1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
 - 21.00" BASE — [3.00" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
14.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

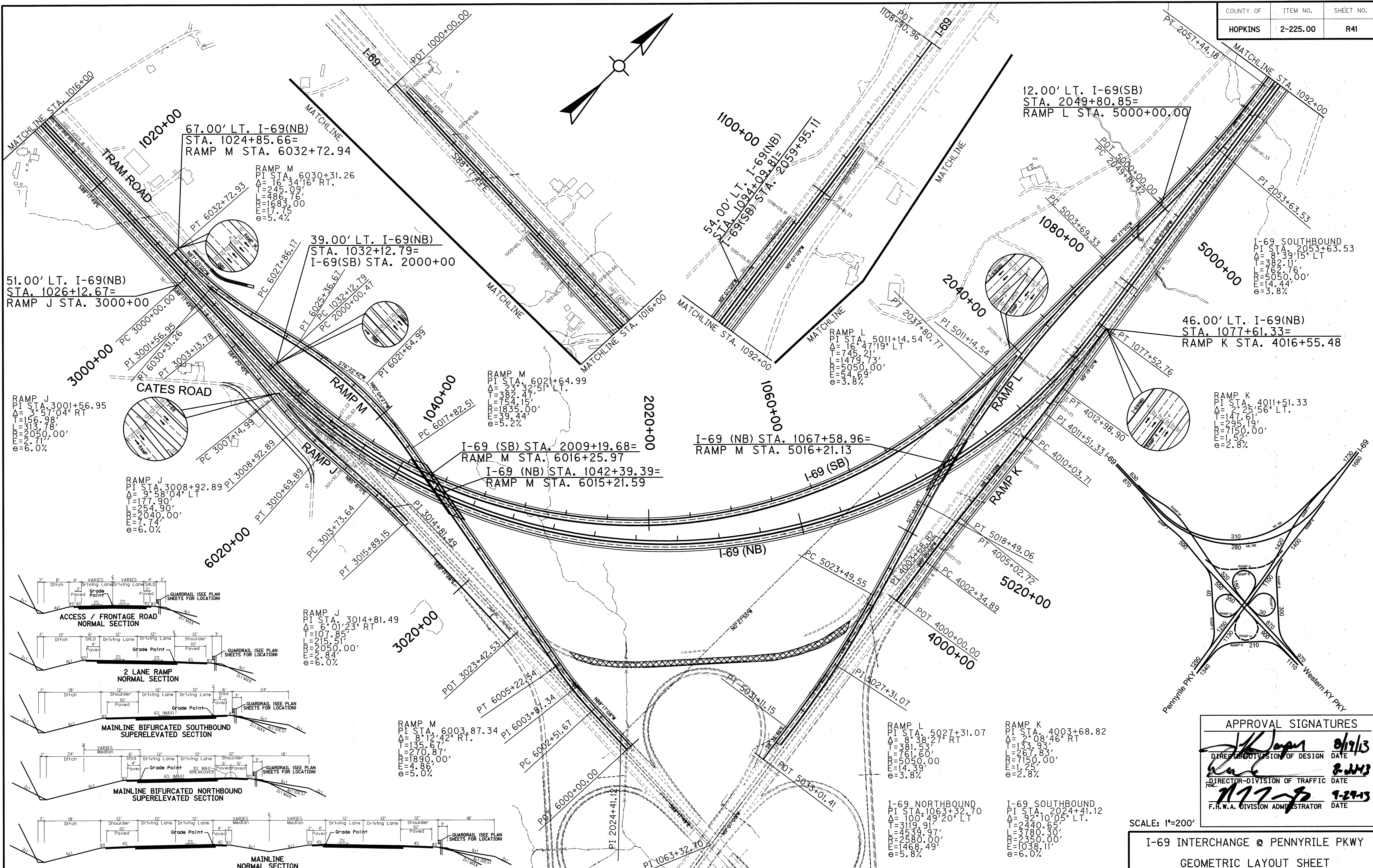
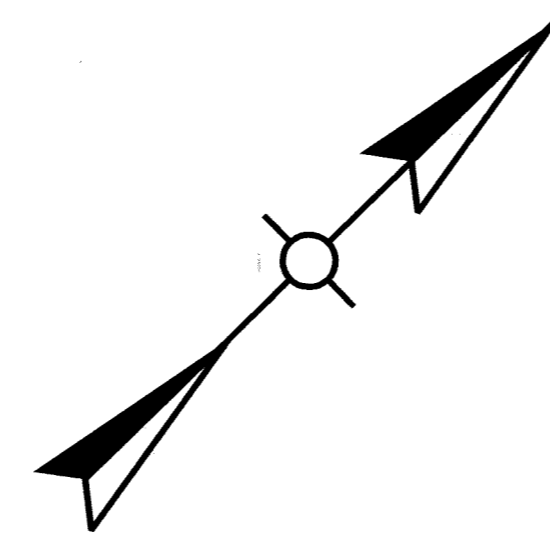
- SOUTHBOUND PENNYRILE PARKWAY WIDENING TRAFFIC LANES**
- 1.50" SURFACE — [1.50" DEPTH CLASS 4 ASPHALT SURFACE 0.5A PG 76-22
 - 22.50" BASE — [3.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 76-22
4.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.50" DEPTH CLASS 4 ASPHALT BASE 1.00D PG 64-22
4.00" DEPTH DRAINAGE BLANKET - TYPE II - ASPHALT
6.00" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED
- SOUTHBOUND PENNYRILE PARKWAY WIDENING SHOULDERS**
- 1.50" SURFACE — [1.50" DEPTH CLASS 3 ASPHALT SURFACE 0.5D PG 64-22
 - 22.50" BASE — [3.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
4.50" DEPTH CLASS 3 ASPHALT BASE 1.00D PG 64-22
14.50" DEPTH DGA BASE
- 16" ROCK AND TYPE IV FILTER FABRIC/ 12" CEMENT STABILIZED ROADBED

NOTE:
SUBGRADE STABILIZATION SHALL BE AT THE CONTRACTOR'S OPTION

A) 16" OF ROCK (#2,3 OR 23) WRAPPED IN TYPE IV FILER FABRIC

B) 12" CEMENT STABILIZED ROADBED (6% PORTLAND CEMENT BY DRY WEIGHT)

FILE NAME: J:\KDOT\HOPKINS.169-PENNYRILE\PHASE.2\PLAN.SET.TYPICAL\TYPICAL.S.DGN
 USER: sstephen
 DATE PLOTTED: September 4, 2013
 E-SHEET NAME:
 MicroStation v8.11.9.357



51.00' LT. I-69(NB)
STA. 1026+12.67=
RAMP J STA. 3000+00

67.00' LT. I-69(NB)
STA. 1024+85.66=
RAMP M STA. 6032+72.94

RAMP M
PI STA. 6030+31.26
 $\Delta = 16^{\circ}34'16''$ RT.
T=245.39'
L=486.76'
R=1683.00'
E=17.75'
e=5.4%

39.00' LT. I-69(NB)
STA. 1032+12.79=
I-69(SB) STA. 2000+00

RAMP M
PI STA. 6021+64.99
 $\Delta = 23^{\circ}32'51''$ LT.
T=382.47'
L=754.15'
R=1835.00'
E=39.44'
e=5.2%

RAMP J
PI STA. 3001+56.95
 $\Delta = 3^{\circ}57'04''$ RT
T=156.98'
L=313.78'
R=2050.00'
E=2.71'
e=6.0%

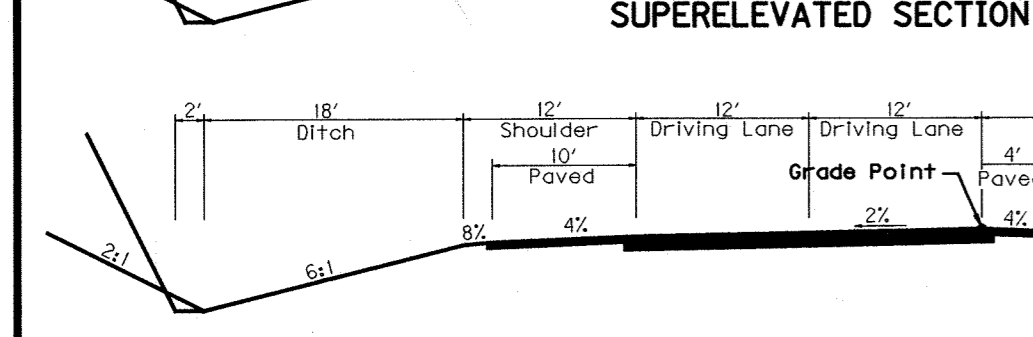
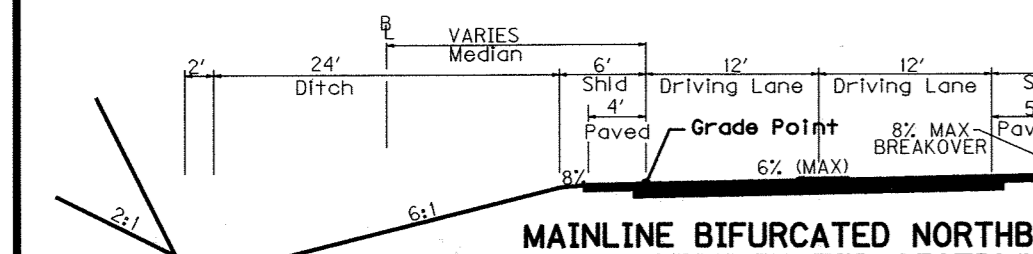
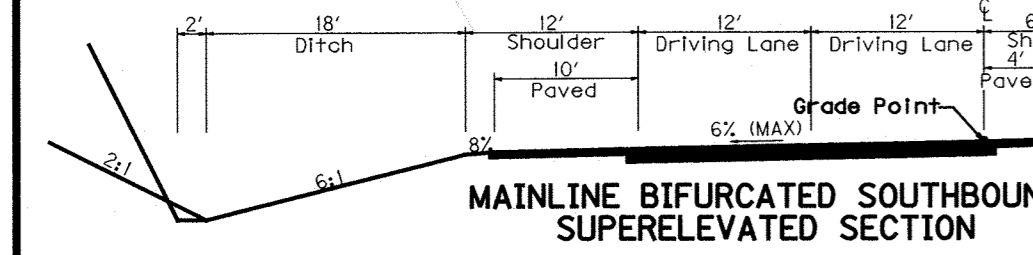
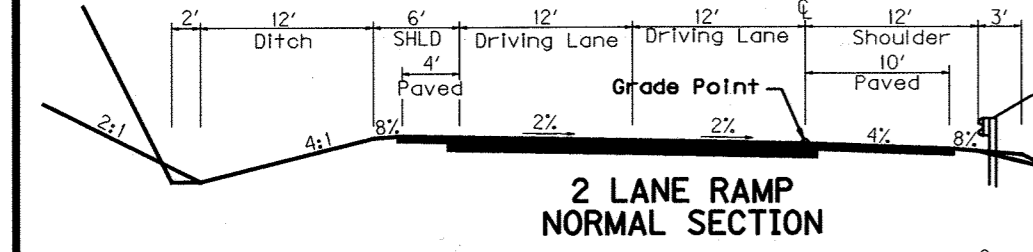
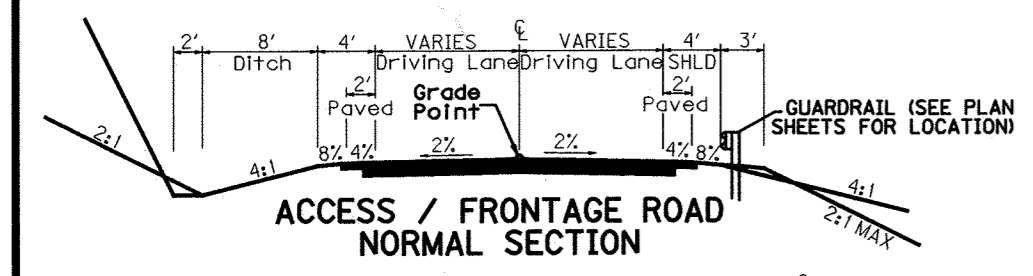
RAMP J
PI STA. 3008+92.89
 $\Delta = 9^{\circ}58'04''$ LT
T=177.90'
L=254.90'
R=2040.00'
E=7.74'
e=6.0%

I-69 (SB) STA. 2009+19.68=
RAMP M STA. 6016+25.97
I-69 (NB) STA. 1042+39.39=
RAMP M STA. 6015+21.59

I-69 (NB) STA. 1067+58.96=
RAMP M STA. 5016+21.13

46.00' LT. I-69(NB)
STA. 1077+61.33=
RAMP K STA. 4016+55.48

RAMP K
PI STA. 4011+51.33
 $\Delta = 2^{\circ}25'56''$ LT.
T=147.61'
L=295.19'
R=7150.00'
E=1.52'
e=2.8%



RAMP J
PI STA. 3014+81.49
 $\Delta = 6^{\circ}01'23''$ RT
T=107.85'
L=215.51'
R=2050.00'
E=2.84'
e=6.0%

RAMP M
PI STA. 6003.87.34
 $\Delta = 8^{\circ}12'42''$ RT.
T=135.67'
L=270.87'
R=1890.00'
E=4.89'
e=5.0%

RAMP L
PI STA. 5027+31.07
 $\Delta = 8^{\circ}38'27''$ RT
T=381.53'
L=761.60'
R=5050.00'
E=14.39'
e=3.8%

RAMP K
PI STA. 4003+68.82
 $\Delta = 2^{\circ}08'46''$ RT
T=133.93'
L=267.83'
R=7150.00'
E=1.25'
e=2.8%

I-69 NORTHBOUND
PI STA. 1063+32.70
 $\Delta = 100^{\circ}49'20''$ LT
T=3119.91'
L=4539.97'
R=2580.00'
E=1468.49'
e=5.8%

I-69 SOUTHBOUND
PI STA. 2024+41.12
 $\Delta = 92^{\circ}10'05''$ LT.
T=2440.65'
L=3780.30'
R=2350.00'
E=1038.11'
e=6.0%

APPROVAL SIGNATURES

| | |
|---------------------------------|---------|
| | 8/17/13 |
| DIRECTOR-DIVISION OF DESIGN | DATE |
| | 8-2-13 |
| DIRECTOR-DIVISION OF TRAFFIC | DATE |
| | 8-2-13 |
| F.H.W.A. DIVISION ADMINISTRATOR | DATE |

SCALE: 1"=200'
I-69 INTERCHANGE @ PENNYRILE PKWY
GEOMETRIC LAYOUT SHEET

I-69 at Western Kentucky Parkway/Pennyrile Parkway Design Executive Summary (DES)

Item No. 2-225.00

Hopkins County

Prepared by:
Palmer Engineering

July 2013





KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF HIGHWAY DESIGN

TC 61-9
Rev. 02/2005
Page 1 of 2

DESIGN EXECUTIVE SUMMARY (I-69)

| | | | | |
|--------------------------|---------------------------|---|------------------------------------|------------|
| COUNTY Hopkins | ITEM # 2-225.00 | FEDERAL PROJECT # IM 0021 (034) | UPN FD52 54 0069 106-107 | UPN |
|--------------------------|---------------------------|---|------------------------------------|------------|

MARS #
86825 01 D

PROJECT DESCRIPTION
The purpose of this project is to reconstruct the interchange to improve the ramp configuration at the existing I-69/Wendell Ford (Western Kentucky) Parkway and Edward Breathitt (Pennyrile) Parkway. This project is part of the I-69 corridor improvement plan.

ROADWAY CLASSIFICATION
 Local Collector Arterial Interstate Rural Urban

| | | |
|--------------------------------|-----------------------------|----------------------------|
| ADT (current) 10,400 | ADT (2040) 15,500 | DHV (2040) 1,730 |
|--------------------------------|-----------------------------|----------------------------|

POSTED SPEED LIMIT
 55 (rural) 35 (urban) Other (Specify.) 70 MPH

DESIGN SPEED (selected by the project team)
 70 MPH - Mainline & Major Splits 55 MPH - Ramps

Concurrence in noted typical exceptions to be obtained from the Director of Highway Design

| DESIGN CRITERIA | EXISTING | TYPICAL | PROJECT TEAM RECOMMENDATION |
|-------------------------------------|--|--|--|
| Number of lanes | 4 | 4 | 4 |
| Pavement width | 48 | 48 | 48 |
| Shoulder width, slope | 3' - inside / 4.0% 12' - outside / 4.0% | 6' - inside / 4.0% 12' - outside / 4.0% | 6' - inside / 4.0% 12' - outside / 4.0% |
| Bridge width | N/A | 42' | 42' |
| Minimum radius ($e_{max}=6.0$) | N/A | 2040 | 2350 |
| Maximum grade | 1.78% | 4.0% | 4.0% |
| Minimum sight dist. | 720' | 730' I-69 | 735' I-69 |
| Border area (urban) | Rural | Rural | Rural |
| Other | | | |

DESIGN CRITERIA NOTES
 The I-69 Major Split is designed to meet 70 mph horizontal and vertical minimums and the On Ramps are designed for 55 mph. The 6% superelevation table was used to reduce superelevation and alleviate possible rollovers in the long curve. The existing parkway will maintain the 3 foot inside shoulder and the new construction will be 6 ft inside shoulder. Transition areas with more than 2 lanes will maintain 4' paved inside shoulder.



KENTUCKY TRANSPORTATION CABINET
 Department of Highways
DIVISION OF HIGHWAY DESIGN

TC 61-9
 Rev. 02/2005
 Page 1 of 2

DESIGN EXECUTIVE SUMMARY (RAMPS)

| | | | | |
|--------------------------|---------------------------|---|------------------------------------|------------|
| COUNTY Hopkins | ITEM # 2-225.00 | FEDERAL PROJECT # IM 0021 (034) | UPN FD52 54 0069 106-107 | UPN |
|--------------------------|---------------------------|---|------------------------------------|------------|

MARS #
86825 01 D

PROJECT DESCRIPTION

The purpose of this project is to reconstruct the interchange to improve the ramp configuration at the existing I-69/Wendell Ford (Western Kentucky) Parkway and Edward Breathitt (Pennyrile) Parkway. This project is part of the I-69 corridor improvement plan.

ROADWAY CLASSIFICATION

Local Collector Arterial Interstate Rural Urban

| | | |
|--------------------------------|-----------------------------|----------------------------|
| ADT (current) 10,400 | ADT (2040) 15,500 | DHV (2040) 1,730 |
|--------------------------------|-----------------------------|----------------------------|

POSTED SPEED LIMIT

55 (rural) 35 (urban) Other (Specify.) 70 MPH

DESIGN SPEED (selected by the project team)

55 MPH - Ramps 70MPH - Major Split

Concurrence in noted typical exceptions to be obtained from the Director of Highway Design

| DESIGN CRITERIA | EXISTING | TYPICAL | PROJECT TEAM RECOMMENDATION |
|-------------------------------------|---|---|---|
| Number of lanes | 1 | 2 | 2 |
| Pavement width | 26 | 34 | 34 |
| Shoulder width, slope | 6' - inside / 4.0% 8' - outside / 4.0% | 6' - inside / 4.0% 8' - outside / 4.0% | 6' - inside / 4.0% 8' - outside / 4.0% |
| Bridge width | N/A | 48' | 48' |
| Minimum radius ($e_{max}=6.0$) | N/A | 1060 | 1683 |
| Maximum grade | N/A | 4.0% | 3.0% |
| Minimum sight dist. | 720' | 495' Ramp | 511' Ramp |
| Border area (urban) | Rural | Rural | Rural |
| Other | | | |

DESIGN CRITERIA NOTES

The I-69 Major Split is designed to meet 70 mph horizontal and vertical minimums and the On Ramps are designed for 55 mph. The 6% superelevation table was used to reduce superelevation and alleviate possible rollovers in the long curve. The existing parkway will maintain the 3 foot inside shoulder and the new construction will be 6 ft inside shoulder. Transition areas with more than 2 lanes will maintain 4' paved inside shoulder.



KENTUCKY TRANSPORTATION CABINET
 Department of Highways
 DIVISION OF HIGHWAY DESIGN

TC 61-9
 Rev. 02/2005
 Page 2 of 2

DESIGN EXECUTIVE SUMMARY

ACCESS CONTROL TYPE
 Fully Controlled Access

ENVIRONMENTAL ACTION
 CE Level 3

DATE (approval)
 8-8-2013

EXISTING PAVEMENT DEPTHS
 4"DGA, 9"PCC (Broken), 7" Asphalt

- ATTACHMENTS**
1. Map showing project location
 2. Typical sections, including bridges (*on 8.5 X 11 inch paper*)
 3. Cost comparison table of alternatives vs. Six-year Plan

- DISCUSSIONS**
1. Alternatives considered including preferred and no build
 2. If preferred alternate cost is 15% or more above Six-Year Plan cost
 3. Maintenance of traffic plan
 4. Avoidance alternatives to water-related impacts
 5. Consideration for bicycle and pedestrian facilities
 6. Purpose and need statement

SUBMITTED BY PROJECT ENGINEER (Dept. of Highways or Consultant)

DATE
 7/22/13

RECOMMENDED BY PROJECT MANAGER

DATE
 07-29-13

RECOMMENDED BY LOCATION ENGINEER

DATE
 8-26-13

RECOMMENDED BY TEBM (for location)

DATE
 8-27-13

COMMENTS

GEOMETRIC APPROVAL GRANTED BY

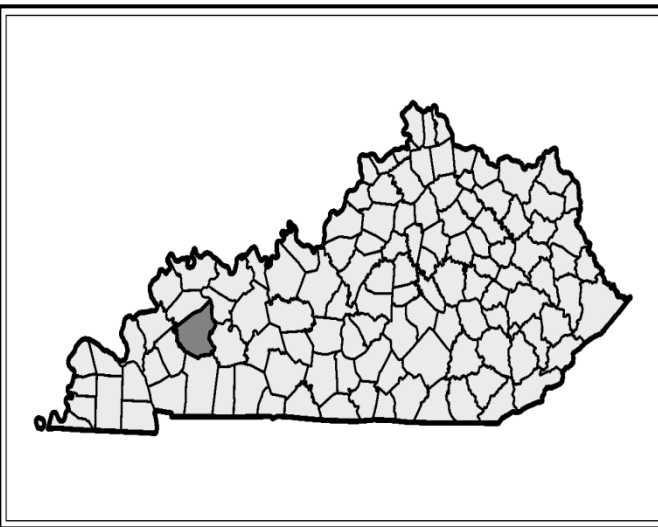
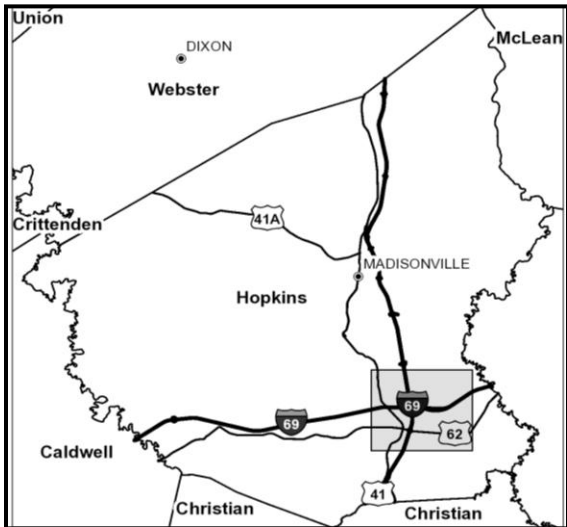
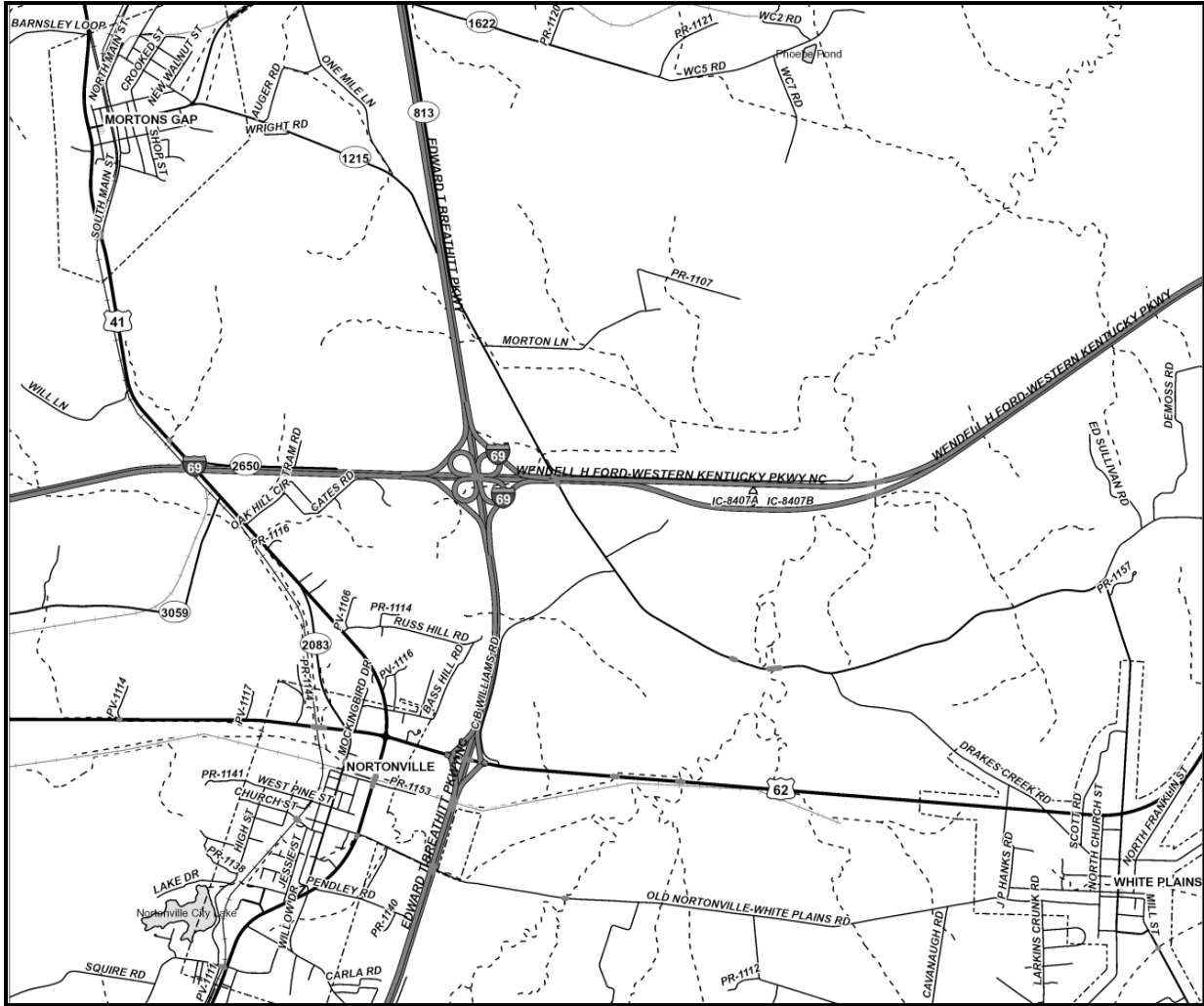
SIGNATURE (Director, Division of Highway Design)

DATE

[Signature]

9/5/13

Location Map



Project Description:

The proposed project reconstructs the interchange between Wendell H. Ford (Western Kentucky) Parkway and Edward T. Breathitt (Pennyrile) Parkway to make Interstate 69 the continuous route. The construction of a 4 lane divided interstate between I-69 (Western Kentucky Parkway) and Pennyrile Parkway will provide interstate route continuity between existing and proposed I-69. The reconstruction will maintain connectivity to/from the existing Pennyrile and Western Kentucky Parkways through the reconstruction of 2 lane ramps. The 2 lane ramps assist in maintaining driver expectancy and support the concept of a major fork.

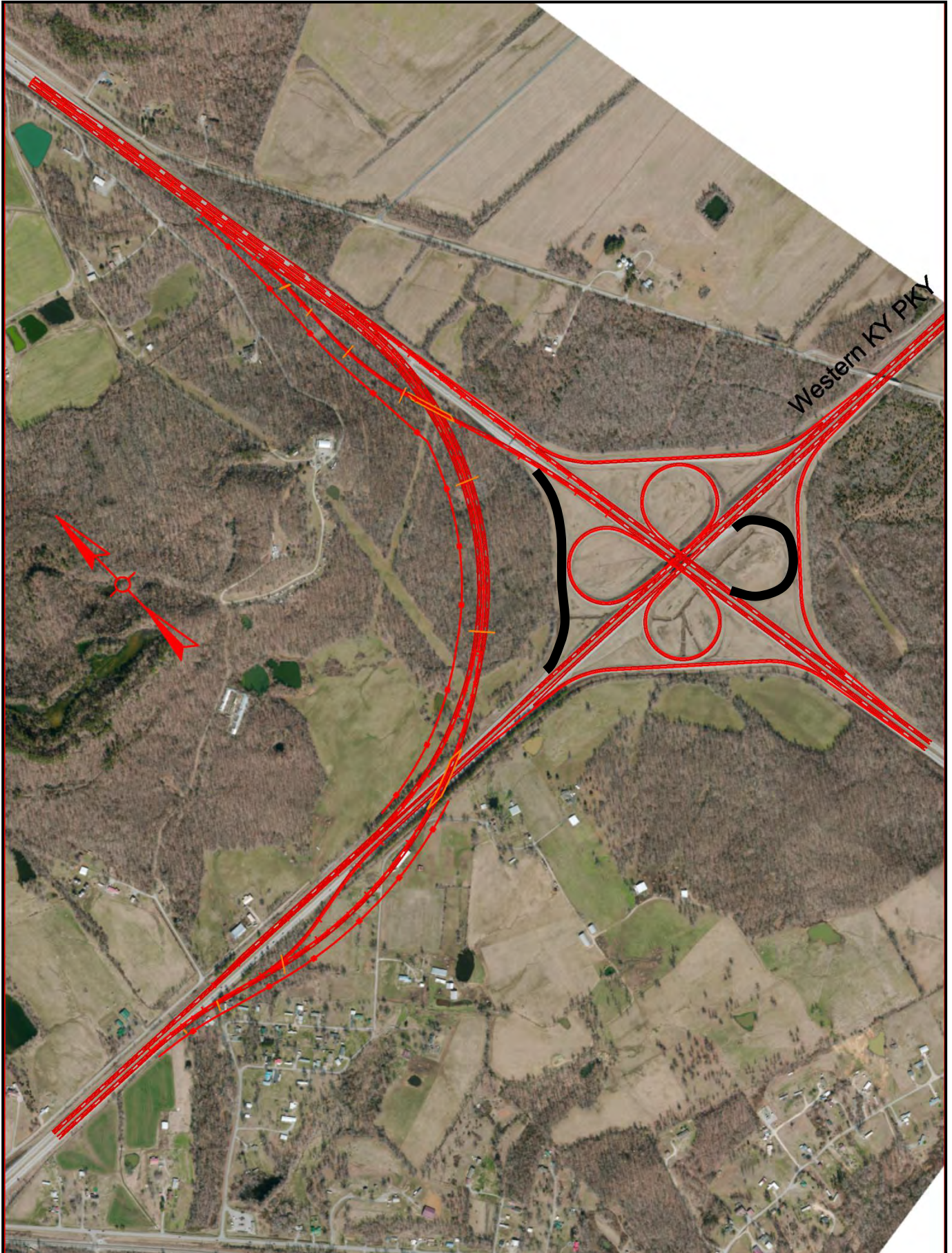
Discussion of Alternatives:

Five alternatives were considered in the proof of concept and preliminary line and grade stages that would improve the interchange to meet Interstate standards. Alternatives 1 through 4 were presented at the Proof of Concept meeting in May 2013. Alternative 1 is variation of the major split proposed in the I-69 Corridor Master Plan. Alternative 2 keeps the southbound and northbound I-69 movements together with a normal depressed median. Alternative 3 also keeps the I-69 movements together but utilizes a minimum horizontal curve to reduce footprint. Alternative 4 utilizes an initial-ultimate construction approach with flyover ramps that can be staged as traffic warrants improvements. Alternative 2 was selected to be carried forward to preliminary line and grade with an option to continue the Western Kentucky and Pennyrile Parkway with two lane ramps. Alternative 5 was added to provide a major split with southbound Pennyrile Parkway and northbound I-69 instead of an exit. Alternatives 2 and 5 were studied in depth and presented at the Preliminary Line and Grade meeting in July 2013. Alternative 5 was chosen as the preferred alternative at Preliminary Line and Grade Meeting.

Alternate 1:

Alternative 1 is a variation of the proposed interchange modifications included in the I-69 Corridor Master Plan. This alternate includes a flyover of the eastbound to northbound I-69 movement over the Western Kentucky Parkway. The eastbound to northbound loop ramp is eliminated and a split movement is implemented. The eastbound to northbound split shifts the split east, to avoid the need of replacing the bridges over US 41 and the railroad.

By shifting the split farther east the AT& T Cell Tower is avoided and the impacts are reduced to the Little Valley community. Another revision made with Alternative 1 is that the eastbound major split is shown as three lanes splitting into two lanes to WK Parkway and two lanes to I-69. The Conceptual Interchange Configuration provides an option to increase the radius of the loop ramp, for the westbound to southbound movement, from WK Parkway to Pennyrile Parkway to provide a higher design speed and greater weaving distances for the two remaining weaving sections. This would increase the safety and extend the functional life of the interchange. For the Proof of Concept Configuration, the westbound to southbound loop ramp was not expanded due to the low traffic volumes.



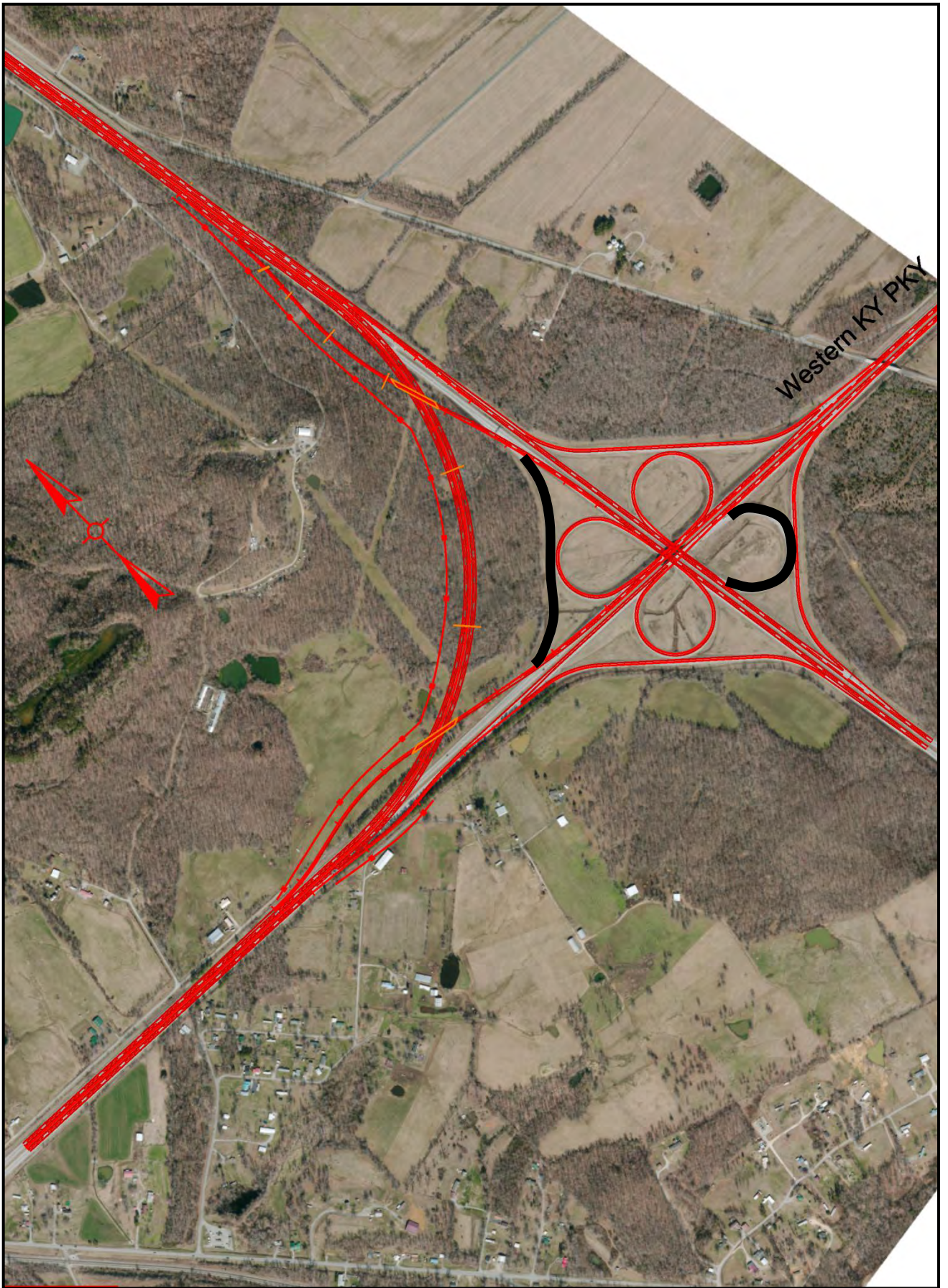
Alternative 1

Alternate 2:

Alternative 2 maintains I-69 northbound and southbound movements together with a normal depressed median section which reduces the footprint of the interchange and the impacts to the properties of the Little Valley community and utilities. A less expensive flyover bridge tying the westbound Western Kentucky Parkway to I-69 is braided over the new interstate lanes. The northbound I-69 exit to Western Kentucky Parkway is unable to utilize the existing pavement but does provide a standard exit angle.

The horizontal curve used for the I-69 movements is not a minimum radius and provides the opportunity to expand the westbound to southbound loop ramp to improve safety for the two remaining weaving sections if needed in a future year. Alternative 2 was selected to be carried forward to the Preliminary Line & Grade meeting with an option to provide 2 lane ramps to the Western Kentucky Parkway/Pennyrile Parkway.

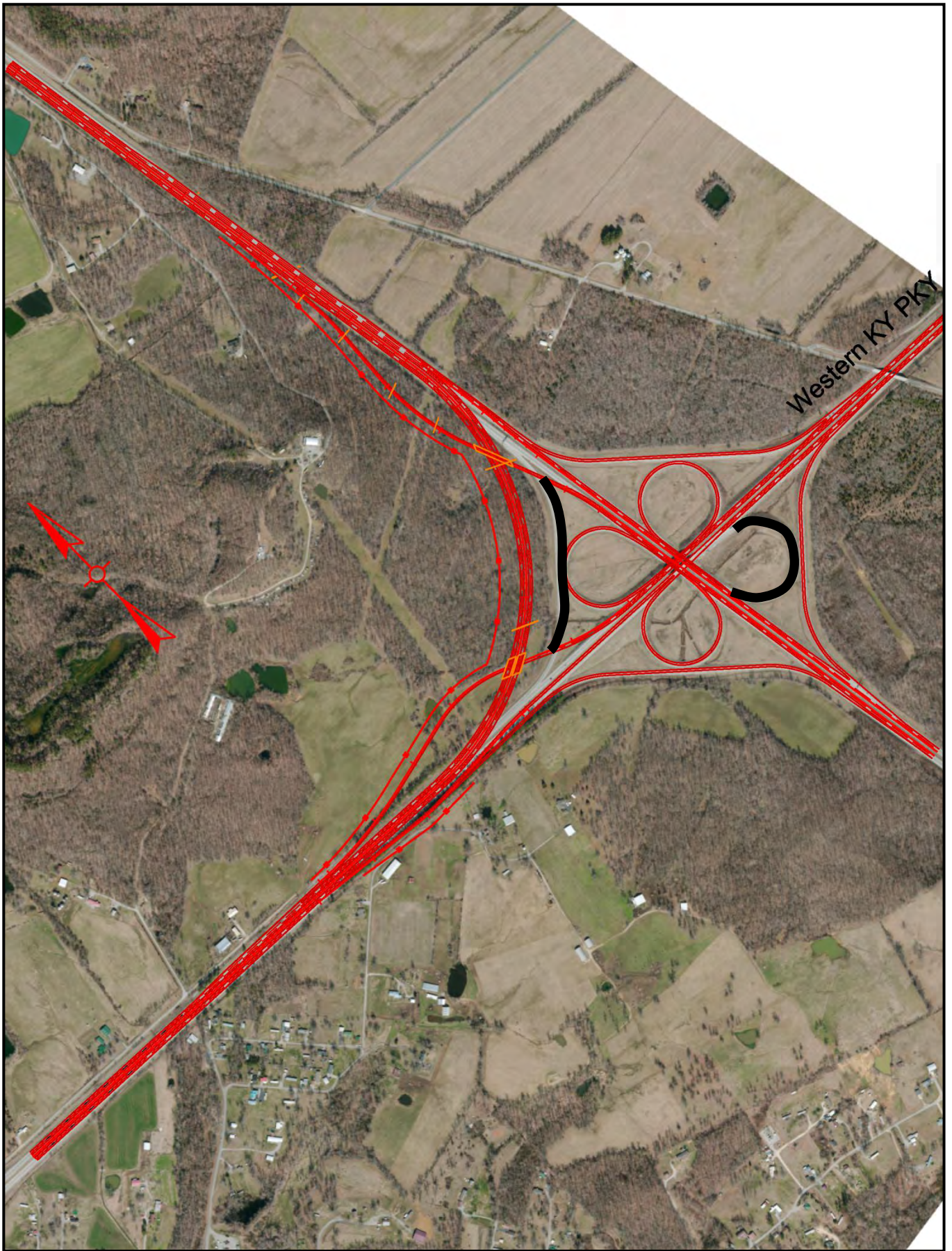
A conceptual drainage plan and maintenance of traffic configuration were developed at preliminary line and grade along with revised utility and property impacts. The Western Kentucky Parkway/Pennyrile Parkway connection was presented with a two-lane option as recommended in the Proof of Concept meeting.



Alternative 2

Alternate 3:

Alternative 3 modifies the concept developed in Alternative 2 to minimize the impacts by using a minimum radius horizontal curve for the I-69 movements with a full 8.0% superelevation. Alternative 3 maintains northbound and southbound I-69 movements together with a depressed median. The compressed spacing of the braided flyover bridges is very tight to the existing loop ramps which requires steep grades and eliminates any future improvements to the westbound to southbound loop ramp to increase weaving distances. The eastbound I-69 split to Western Kentucky Parkway is shifted west to provide a clear exit angle and also to provide spacing before the Pennyrile Parkway southbound exit.



Alternative 3: Proof of Concept Configuration

Alternate 4:

Alternative 4 provides an initial-ultimate construction approach which uses left hand exits initially and provides right hand exits in the future when operational analysis justifies. Alternative 4 replaces the eastbound to northbound loop ramp portion of I-69 with a two-lane flyover over the existing westbound to southbound loop ramp. The northbound flyover would be 2 bridges that would extend over the Western Kentucky Parkway and the Pennyrile Parkway Loop Ramps. The eastbound to southbound movement is relocated to eliminate the need for an additional structure. The westbound to northbound movement is kept on the existing alignment and merges on the left side of I-69 northbound.

The Ultimate Interchange for Alternative 4 could be constructed later as traffic volumes increase and becomes warranted. In this scenario the westbound to southbound loop ramp could be expanded to increase weaving distances for the two remaining weaves and increasing the radii for the southbound to westbound I-69 movement above the minimum radius. As shown in the Proof of Concept Configuration, the westbound to southbound loop ramp is not expanded due to low traffic volumes, but the existing loop ramp is utilized. Right hand exit options are shown from I-69 to WK Parkway and Pennyrile Parkway with flyover bridges so that thru traffic does not confuse the movement with staying on I-69.



Alternative 4: Proof of Concept Configuration

Alternate 5:

Alternative 5 was developed at the Proof of Concept meeting to improve driver expectancy and provide a major split instead of an exit. Alternative 5 is a variation of Alternative 2 which was selected to be carried forward to the Preliminary Line & Grade meeting. Alternative 5 provides a major split with southbound Pennyrile Parkway instead of an exit which allows for two lanes to be maintained, easier signing, and improved traffic flow.

An advantage of the major split provides the benefit of a larger median between the southbound and northbound I-69 traffic, which increases safety. The Northbound I-69 exit does not utilize the existing pavement but rather comes off around the curve where a more definitive standard exit angle is utilized for the major split. The westbound movement from WK Parkway to I-69 is accomplished by a flyover bridge over the new interstate lanes. The southbound movement from I-69 to Pennyrile Parkway is also accomplished by a flyover bridge but only the new northbound I-69 lanes are required to be spanned.

As with Alternative 2, Alternative 5 was shown with the option to continue the Western Kentucky Parkway / Pennyrile Parkway connection with two lanes. A conceptual drainage plan and maintenance of traffic configuration were also developed for this alternative.



Alternative 5: Preliminary Line & Grade Configuration

No Build Alternative:

The existing interchange between the Western Kentucky Parkway and Pennyryle Parkway would continue to be non-compliant with interstate standards. This would leave the future I-69 corridor deficient and with a gap in the national I-69 route. Under this scenario, the Parkways would still connect the future sections of I -69.

Preferred Alternative:

Alternatives 2 and 5 were selected to be carried forward from the Proof of Concept meeting and discussed at the Preliminary Line & Grade meeting. The major difference between the two alternatives is that Alternative 2 treats the southbound Pennyryle movement as a two lane exit, while Alternative 5 improves the movement into a major split. Alternative 5 with the two-lane option of continuing the Western Kentucky Parkway / Pennyryle Parkway connection is the recommended alternative that was chosen to advance to Phase II design. The design team preferred Alternative 5 due to the benefits of the larger median provided, negating any future need of a median barrier wall to increase safety, and driver expectation of a major split over an exit. The cost differential between Alternatives 2 and 5 is minimal and did not outweigh the other benefits.

The project team discussed reducing the parkway ramps to 1-lane but determined that driver expectancy and directional traffic distribution warranted the additional lanes. A cost savings was prepared for the Preliminary Line and Grade Meeting and a recommendation was made to build 2 lane ramps to and from the Western Kentucky and Pennyryle Parkway.

COST ESTIMATE

Proof of Concept Estimate:

| | | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | | | |
|---------------------------|-----------------|---------------|---------------|---------------|---------------|-------------|-------------|--------------|
| | | | | | Phase 1 | Phase 2 | Phase 3 | Total |
| ROADWAY | | | | | | | | |
| Earthwork | CY | \$1,360,000 | \$1,150,000 | \$1,180,000 | \$1,000,000 | \$1,000,000 | \$500,000 | \$2,500,000 |
| Pavement | SY | \$7,100,000 | \$5,900,000 | \$3,500,000 | \$3,300,000 | \$2,100,000 | \$2,000,000 | \$7,400,000 |
| Structures | Ft ² | \$3,600,000 | \$2,500,000 | \$2,500,000 | \$6,000,000 | \$0 | \$3,000,000 | \$9,000,000 |
| Misc. | 40% | \$4,800,000 | \$3,800,000 | \$2,900,000 | \$4,200,000 | \$1,200,000 | \$2,200,000 | \$7,600,000 |
| | | | | | | | | |
| CONSTRUCTION TOTAL | | \$16,860,000 | \$13,350,000 | \$10,080,000 | \$14,500,000 | \$4,300,000 | \$7,700,000 | \$26,500,000 |
| RIGHT OF WAY | | \$1,700,000 | \$500,000 | \$300,000 | \$1,000,000 | \$400,000 | \$1,700,000 | \$3,100,000 |
| UTILITIES | | \$700,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$500,000 | \$2,500,000 |
| PROJECT TOTAL | | \$19,260,000 | \$14,850,000 | \$11,380,000 | \$16,500,000 | \$5,700,000 | \$9,900,000 | \$32,100,000 |

Preliminary Line & Grade Estimate:

| | | Alternative 2 | Alternative 5 | One Lane WKY Ramps |
|---------------------------|-----------------|---------------|---------------|--------------------|
| <i>ROADWAY</i> | | | | |
| Earthwork | CY | \$2,200,000 | \$2,900,000 | -\$300,000 |
| Pavement | SY | \$7,500,000 | \$7,300,000 | -\$450,000 |
| Structures | Ft ² | \$2,800,000 | \$2,200,000 | -\$500,000 |
| Misc. | 40% | \$5,000,000 | \$5,000,000 | -\$500,000 |
| <i>CONSTRUCTION TOTAL</i> | | \$17,500,000 | \$17,400,000 | -\$1,750,000 |
| RIGHT OF WAY | | \$950,000 | \$950,000 | \$0 |
| UTILITIES | | \$1,000,000 | \$500,000 | \$0 |
| <i>PROJECT TOTAL</i> | | \$19,450,000 | \$18,850,000 | -\$1,750,000 |

Preferred Alternative Cost Versus Six Year Plan:

| | | Preferred Alternate (Alternative 5) | Six Year Plan |
|---------------------------|--|-------------------------------------|---------------|
| <i>CONSTRUCTION TOTAL</i> | | \$17,400,000 | \$10,000,000 |
| RIGHT OF WAY | | \$950,000 | - |
| UTILITIES | | \$500,000 | - |
| <i>PROJECT TOTAL</i> | | \$18,850,000 | \$10,000,000 |

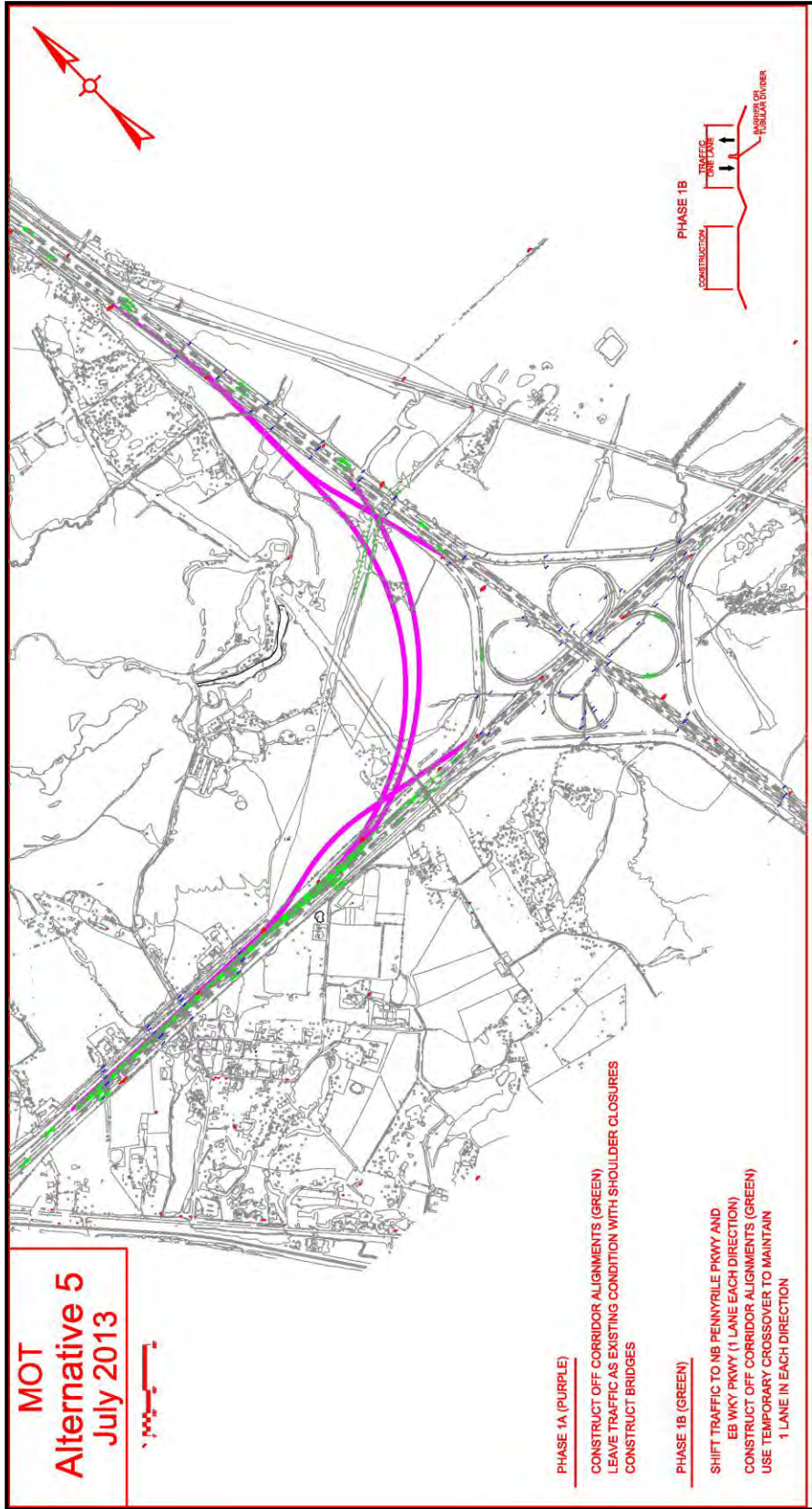
The cost of the preferred alternative is greater than 15% of the 6 year plan estimate due to the project scope being modified to provide a continuous route instead of improving ramp tapers which was the original concept. The improvement of ramp tapers was not acceptable to FHWA so the project scope was modified to include providing a new segment of roadway that maintains a continuous route. The preferred alternative provides an optimal solution from a cost, safety, and driver expectancy perspective.

Maintenance of Traffic:

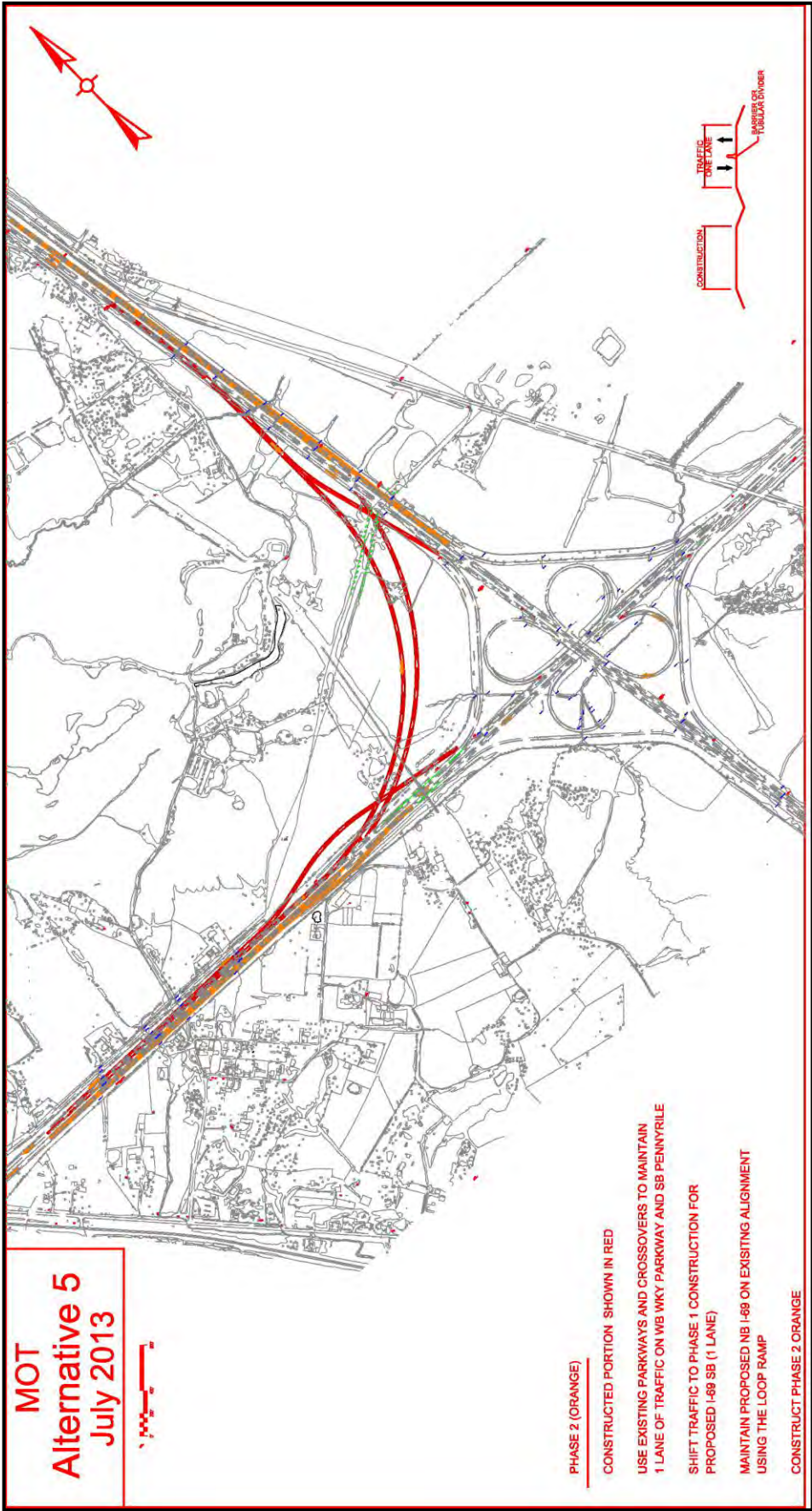
Traffic will be maintained in three phases for this project. Phase 1A will include constructing the portions of the corridor alignments that don't impact the existing parkways and construction of the bridges. During phase 1, traffic will be maintained on the existing lanes with only shoulder closures. During Phase 1B, traffic is shifted to northbound Pennyryle Parkway and eastbound Western Kentucky Parkway, one lane each direction, using crossovers constructed at specified locations. Construction of the Southbound I-69 can be completed along with auxillary lanes and tapers during Phase 1B.

During Phase 2, traffic is shifted to the westbound Western Kentucky Parkway and southbound Pennyriple Parkway by using crossovers. Traffic will be one lane in each direction through the interchange area and northbound traffic will be required to cross back to the existing parkway to access the existing loop ramp to access northbound Pennyriple Parkway. This phase will complete all widening on the eastbound Western Kentucky Parkway and northbound Pennyriple Parkway.

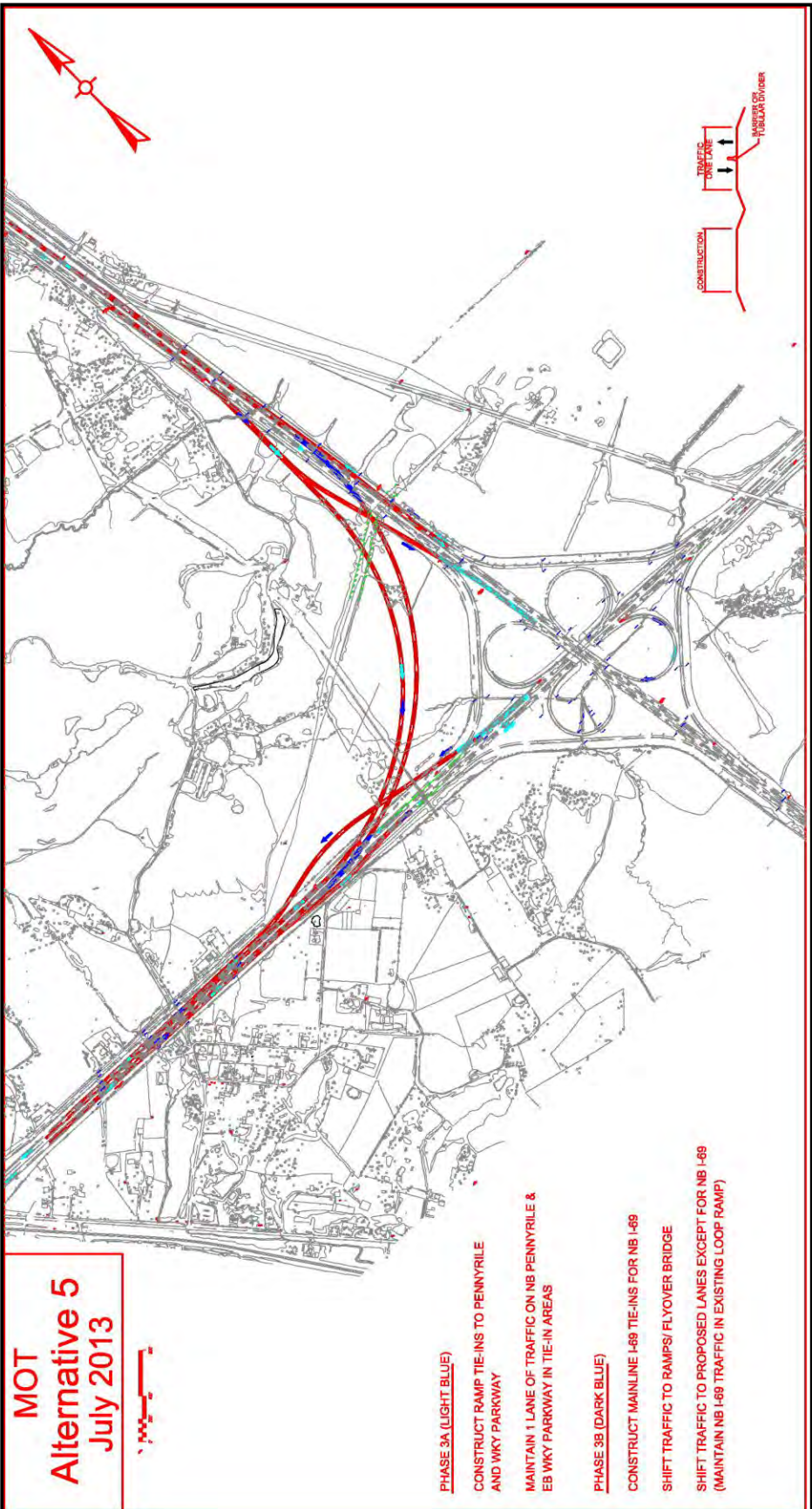
Phase 3 will construct the ramp tie-in and will require two phases to complete. During Phase 3A construction of the ramp tie-ins to Pennyriple and WKY Parkways takes place while one lane traffic is maintained on northbound Pennyriple and eastbound Western Kentucky Parkway in tie-in areas. During Phase 3B the mainline I-69 tie-ins for northbound I-69 is constructed. Traffic is shifted to ramps / flyover bridges and to the proposed lanes except for northbound I-69, which is maintained on the existing loop ramp.



Alternative 5 MOT: Phase 1



Alternative 5 MOT: Phase 2



Alternative 5 MOT: Phase 3

Avoidance Alternatives:

The proposed alignment will widen the roadway slightly along the existing alignment, affecting one large water crossing. The 4.2' X 8' box culvert, under I-69 north of the interchange, will be extended and only minor impacts are expected. Current KYTC erosion control measures will be applied on this project to minimize erosion.

Bicycle and Pedestrian Facilities:

Due to the project being a limited access interstate highway, bicycle and pedestrian facilities were not considered along the corridor.

Value Engineering Study

A Value Engineering Study was not completed for this project due to the estimates being below the Value Engineering Threshold.

Purpose and Need Statement:

The purpose and need of this project is to make the necessary improvements at the Wendell Ford (Western Kentucky) Parkway and Edward Breathitt (Pennyrile) Parkway Interchange to provide a continuous route for I-69. The improvements include constructing a segment of roadway that creates route continuity from the existing I-69 segment (Western Kentucky Parkway) to the proposed I-69 segment (Pennyrile Parkway). The I-69 corridor is designated as a "North American trade route" and "NAFTA corridor" due to the anticipated role in truck freight movements from Canada and Mexico and points in-between. The corridor will result in the improvement of moving goods, enhancing economic development, and providing system linkage. The proposed improvements upgrade the existing facilities to be interstate compliant, improve safety, and provide continued connectivity to the regional facilities.



400 Shoppers Drive
P.O. Box 747
Winchester, KY 40392
859-744-1218
www.palmernet.com

APPENDIX C

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS PLANS OF PROPOSED PROJECT I-69 INTERCHANGE IMPROVEMENT - RIGHT OF WAY PLANS

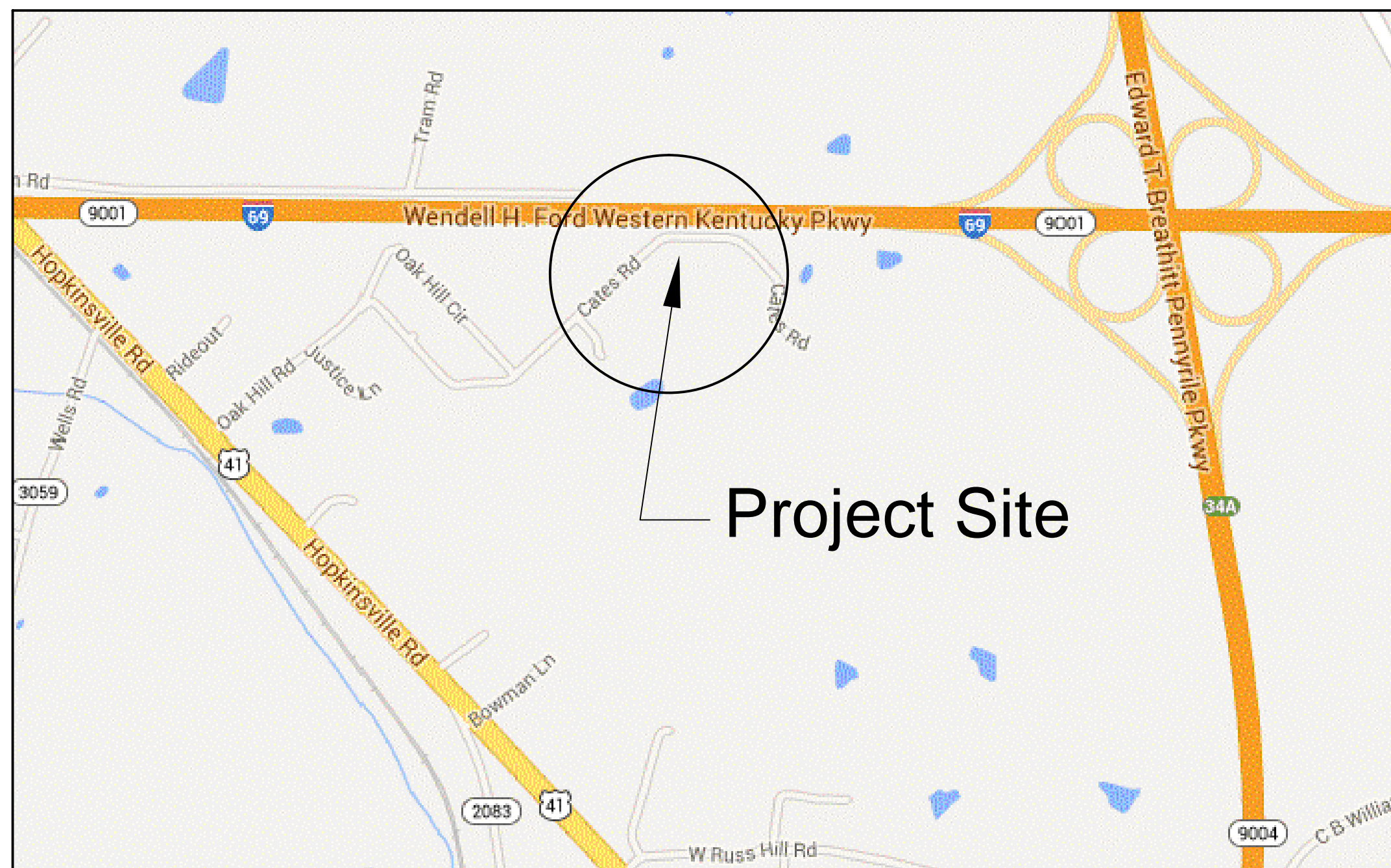
WATER LINE RELOCATION PROJECT SOUTH HOPKINS WATER DISTRICT CATES ROAD HOPKINS COUNTY, KENTUCKY AUGUST 2013

LEGEND

- 12" REBAR SET W/PLASTIC CAP STAMPED "PLS 3277" UNLESS OTHERWISE NOTED.
- △ EXISTING MONUMENTATION UNLESS OTHERWISE NOTED.
- MEANDER POINT
- ⊙ BENCHMARK - AS NOTED
- PROPERTY LINE
- ADJOINING PROPERTY LINE
- UTILITY & DRAINAGE EASEMENT
- BUILDING SETBACK LINE
- X-X-X- FENCE
- SF- SILT FENCE
- GUARDRAIL
- GV □ GAS VALVE
- GM □ GAS METER/POST
- WV □ WATER VALVE
- WM □ WATER METER
- TP ○ TELEPHONE POLE
- UP ○ UTILITY POLE
- GLY — POLE GUY
- LP ○ LIGHT POLE
- G — GAS LINE
- OHE —OHE OVERHEAD ELECTRIC LINE
- OHT —OHT OVERHEAD TELEPHONE LINE
- OHC —OHC OVERHEAD CABLE LINE
- UGE —UGE UNDERGROUND ELECTRIC LINE
- UGT —UGT UNDERGROUND TELEPHONE LINE
- UGC —UGC UNDERGROUND CABLE LINE
- CO ○ CLEANOUT
- FH ○ FIRE HYDRANT
- MH ○ SANITARY SEWER MANHOLE
- MH ○ STORM SEWER MANHOLE
- MH ○ TELEPHONE MANHOLE
- CB □ CATCH BASIN
- RCP == CONCRETE PIPE
- PVC == PLASTIC PIPE
- VCP == CLAY PIPE
- CMP == CORRUGATED METAL PIPE
- BM ⊙ BENCHMARK
- H.C. HANDICAP RAMP
- WL — EX WATER LINE
- ==S== EX SANITARY SEWER LINE
- PROPOSED WATER LINE

- UTILITY OWNERS**
- WATER**
SOUTH HOPKINS WATER DIST.
129 S. MAIN STREET
DANFORD SPRINGS, KY 42408
(270) 797-5760
CONTACT: JON BLAYLOCK
- CABLE TELEVISION**
TIME WARNER CABLE
250 MADISON SQUARE DRIVE
MADISONVILLE, KY 42431
(655) 821-7018
CONTACT:
- GAS**
ATMOS ENERGY
2401 NEW HARTFORD ROAD
OWENSBORO, KY 42303
(270) 685-8103
CONTACT: JIM CAPPIS
- TELEPHONE**
AT&T
305 SOUTH MAIN STREET
MADISONVILLE, KY 42431
(270) 821-9021
CONTACT:
- ELECTRIC**
KENTUCKY UTILITIES
111 W. MAIN ST
EARLINGTON, KENTUCKY 42401
(800) 981-0600
CONTACT:

NOTE:
PROPERTY LINES TAKEN FROM
PVA MAPPING, NOT VERIFIED
BY FIELD SURVEY, ACTUAL
LOCATION MAY CHANGE



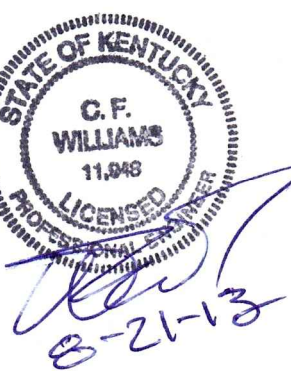
VICINITY MAP
NOT TO SCALE

GENERAL NOTES (WATER LINE INSTALLATION)

1. EXISTING UTILITIES SHOWN ARE BASED ON ABOVE GROUND EVIDENCE AND INFORMATION AVAILABLE. CONTRACTOR SHALL CONTACT ALL LOCAL UTILITY PROVIDERS TO VERIFY THE EXISTENCE AND LOCATION OF EXISTING UTILITIES. CONTRACTOR SHALL USE CAUTION NOT TO DISTURB EXISTING UTILITIES WHETHER SHOWN ON THESE DRAWINGS OR NOT. CONTACT ENGINEER IF CONFLICTS WITH WORK AND EXISTING UTILITIES ARISE. (CALL B. U. D. AT 1-800-752-6007)
2. CONTRACTOR SHALL INSTALL, MAINTAIN AND REMOVE EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THESE DRAWINGS OR AS SITE CONDITIONS AND CONSTRUCTION ACTIVITIES REQUIRE. MEASURES INCLUDE BUT NOT LIMITED TO: SILT FENCINGS, DITCH SILT CHECKS, STORM INLET PROTECTION, STORM OUTLET PROTECTION, TEMPORARY SLOPE DRAINS, TEMPORARY SEDIMENT TRAPS, SEEDING AND OTHER MEASURES.
3. CONTRACTOR SHALL CONFORM TO THE LATEST EDITION OF THE KENTUCKY TRANSPORTATION CABINET STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION FOR ALL ITEMS NOT MENTIONED IN THE PROJECT SPECIFICATIONS.
4. PERMISSION MUST BE OBTAINED FROM RESPONSIBLE GOVERNMENTAL AUTHORITY PRIOR TO ENCROACHMENT UPON ANY RIGHT-OF-WAY, EASEMENT OR PROPERTY.
5. CONTRACTOR SHALL LOCATE AND EXPOSE EXISTING MAINS PRIOR TO MAKING CONNECTIONS TO DETERMINE THE EXACT ELEVATION OF THE EXISTING MAIN SO THAT NEEDED ELEVATION ADJUSTMENTS CAN BE MADE TO THE PROPOSED MAIN. ALL CHANGES MUST BE APPROVED BY THE ENGINEER. CONTACT ENGINEER IF CONFLICTS WITH WORK AND EXISTING UTILITIES ARISE. (CALL B. U. D. AT 1-800-752-6007)
6. WATER METERS WILL BE LOCATED ON THE CUSTOMERS PROPERTY IMMEDIATELY PAST THE RIGHT OF WAY LINE, METERS WILL NOT BE SET ON CITY RIGHT-OF-WAY.
7. ALL BENDS, FITTINGS, ETC IN EITHER THE HORIZONTAL OR VERTICAL DIRECTION SHALL HAVE CONCRETE THRUST BLOCKING AS PER DETAILS IN THE SPECIFICATION AND DETAILS DRAWING SHEETS, CONCRETE TO BE INCIDENTAL TO WATER AND SEWER MAIN CONSTRUCTION.
8. THE CONTRACTOR SHALL COORDINATE ALL WATER CONNECTIONS, CUTS, SERVICE RECONNECTIONS AND CHANGEOVER, ETC. WITH THE OFFICIALS FROM THE CITY.
9. ALL MATERIALS THAT ARE TO BE REMOVED ARE TO BE RETURNED TO THE OWNER, AFTER THEY HAVE BEEN CLEANED. LOCATION TO BE DETERMINED BY THE OWNER.
10. ALL ROAD CROSSINGS THAT ARE OPEN CUT SHALL HAVE STEEL ENCASEMENT PIPE AND BE BACKFILLED WITH FLOWABLE FILL. FLOWABLE TO BE INCIDENTAL TO THE COST OF THE STEEL ENCASEMENT PIPE.
11. THE WATER CONSTRUCTION IS NOT CONSIDERED COMPLETE UNTIL APPROVED BY THE OWNERS.
12. ALL EXISTING SERVICES ARE TO BE MAINTAINED THRU OUT THE CONSTRUCTION. ALL SERVICES TO BE CONNECTED TO THE NEW WATER MAIN. ALL FITTINGS ARE INCIDENTAL TO THE TIE-INS. CONTRACTOR IS RESPONSIBLE FOR BOILED WATER NOTIFICATION TO ALL RESIDENTS.
13. EXACT LOCATION OF GAS SERVICE LINES ARE UNKNOWN.
14. CONTRACTOR IS RESPONSIBLE FOR INSTALLING 12 GAUGE COPPER TRACER WIRE THE LENGTH OF NEW CONSTRUCTION.
15. SHOULD THERE BE A CONFLICT BETWEEN KYTC SPECIFICATIONS AND THE UTILITY OWNERS SPECIFICATIONS THE MOST STRINGENT SHALL APPLY.
16. EFFORTS HAVE BEEN MADE TO INDICATE THE MOST ACCURATE LOCATIONS OF EXISTING STRUCTURES, PIPING, & UTILITIES. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SITE, AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES ENCOUNTERED BEFORE BEGINNING CONSTRUCTION OPERATIONS.
17. BORINGS HAVE NOT BEEN OBTAINED ON THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR SATISFYING HIMSELF OF ACTUAL SUB-SURFACE CONDITIONS PRIOR TO CONSTRUCTION.
18. DIMENSIONS OF EXISTING STRUCTURES AND/OR SIZE RESTRICTIONS ARE APPROXIMATE. ALL NECESSARY DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES & TOPOGRAPHY SHALL BE VERIFIED BY THE CONTRACTOR IN THE FILED PRIOR TO CONSTRUCTION OPERATIONS.
19. ALL BURIED PIPES SHALL HAVE A MINIMUM OF 30" COVER AS MEASURED VERTICAL FROM FINISHED GRADE TO THE TOP OF PIPE, UNLESS OTHERWISE NOTED.
20. ALL CONSTRUCTION STAKING TO BE PERFORMED BY CONTRACTOR. ENGINEER TO PROVIDE CONTROL.

PREPARED BY:

RONALD JOHNSON & ASSOCIATES, P.S.C.
CONSULTING ENGINEERING • LAND SURVEYING
ENVIRONMENTAL CONSULTING • CONSTRUCTION INSPECTION
24 WEST CENTER STREET MADISONVILLE, KENTUCKY 42431
PHONE (270) 821-6392 FAX (270) 821-6619 www.rjaengineering.com



DRAWING INDEX

| | | |
|------------------|----------------|----|
| COVER SHEET | | |
| PLAN & PROFILE | 10+00 to 17+91 | W1 |
| STANDARD DETAILS | | D1 |

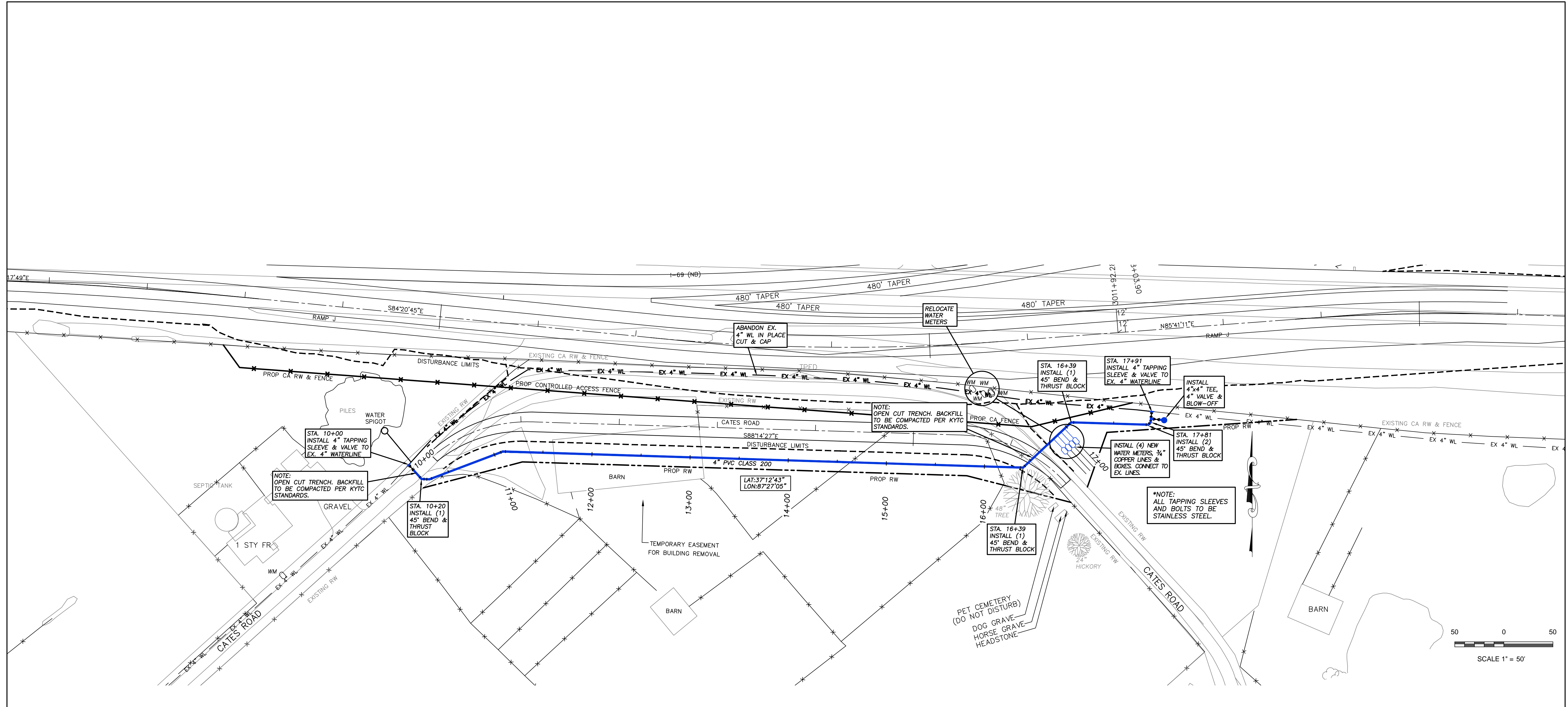
SET# _____



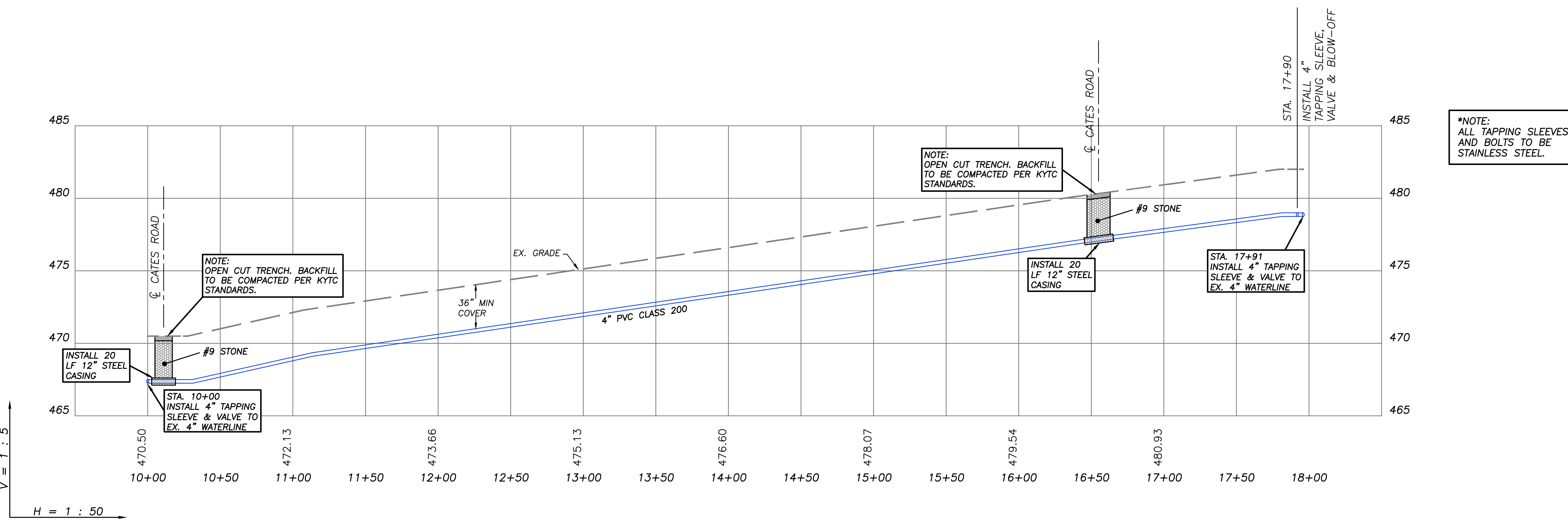
B.U.D.
Before digging the contractor shall locate underground utilities. The contractor is responsible for notifying Kentucky B.U.D. (1-800-752-6007) for verification of utilities. In addition, the contractor is responsible to contact all other utilities involved.

| | |
|--------------|-------------|
| APPROVED BY: | PROJECT NO: |
| DATE: | 13-23 |
| REVISIONS: | |

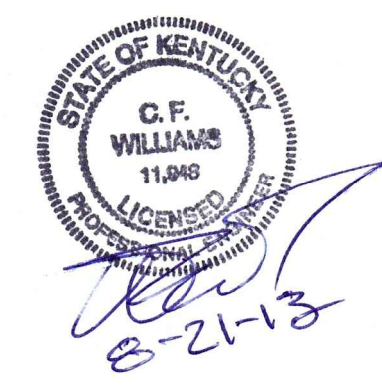
RONALD JOHNSON & ASSOCIATES, P.S.C.
 CONSULTING ENGINEERING, LAND SURVEYING
 ENVIRONMENTAL CONSULTING, CONSTRUCTION INSPECTION
 24 WEST CENTER STREET, MADISONVILLE, KENTUCKY 42431
 PHONE: (270) 821-6392 FAX: (270) 821-6619 www.rjengineering.com



WATER LINE
10+00 to 17+91



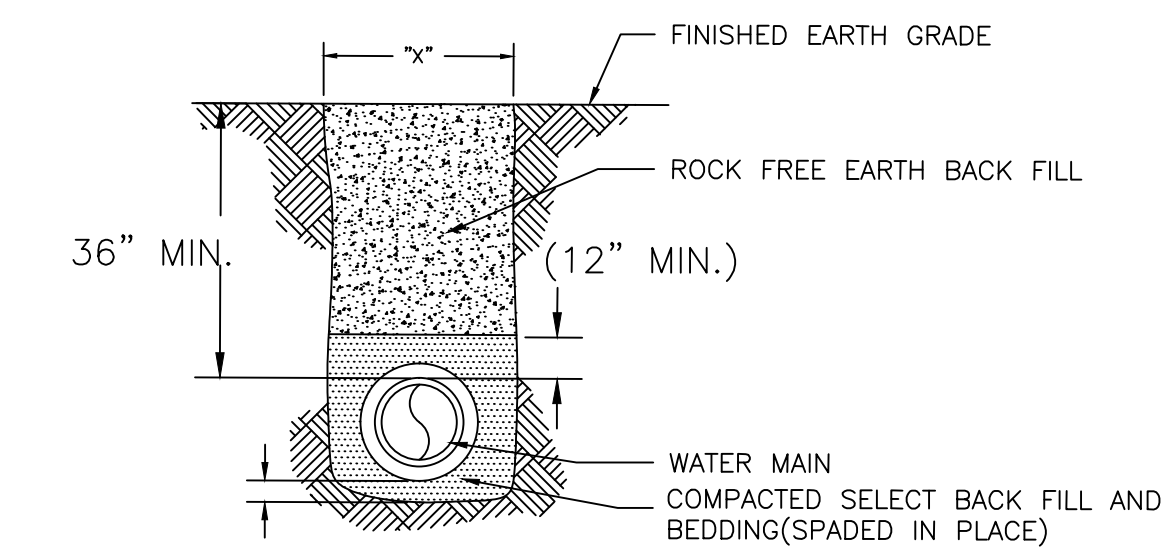
CATES ROAD
WATERLINE RELOCATION
HOPKINS COUNTY, KENTUCKY



STANDARD DETAILS
WATER LINE CONSTRUCTION

FACSIMILES OF PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR SEALS, IF AFFIXED TO THIS DOCUMENT, SHALL BE CONSIDERED LEGITIMATE ONLY IF SIGNED AND DATED BY THE REGISTRANT.

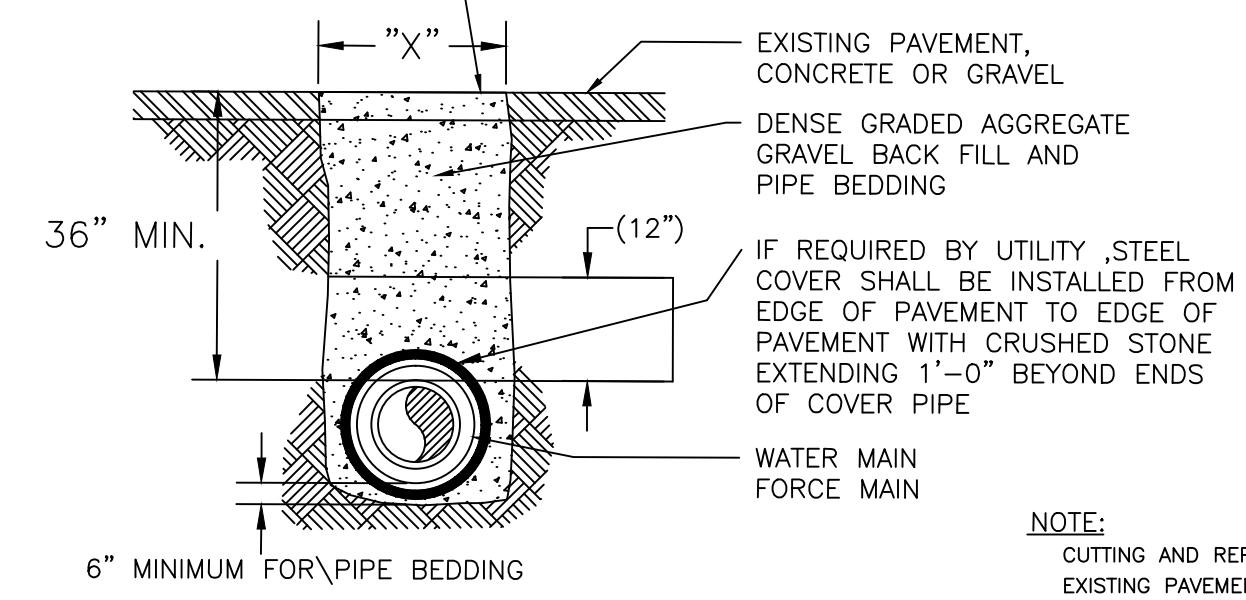
KENTUCKY STATUTES (KRS 367.4901 THRU 367.4917) REQUIRE THAT ALL EXCAVATORS PLANNING EXCAVATION OR DEMOLITION WORK SHALL NOTIFY ALL UTILITY COMPANIES IN THE AREA AND/OR AN UNDERGROUND PROTECTION SERVICE SUCH AS "BUD" (1-800-752-6007) AT LEAST TWO (2) WORKING DAYS BEFORE COMMENCING WORK TO ALERT UTILITY COMPANIES IN THE AREA WITH UNDERGROUND FACILITIES OF THE PLANNED EXCAVATION OR DEMOLITION ACTIVITIES.



PAVEMENT REPLACEMENT TO MEET THE REQUIREMENTS OF THE APPROPRIATE GOVERNING BODY (SEE BACK FILL REQUIREMENTS FOR PIPE IN PROPOSED ROAD, EXISTING CITY ROAD AND STATE HIGHWAYS, THIS SHEET)

CASE I
OPEN AREAS

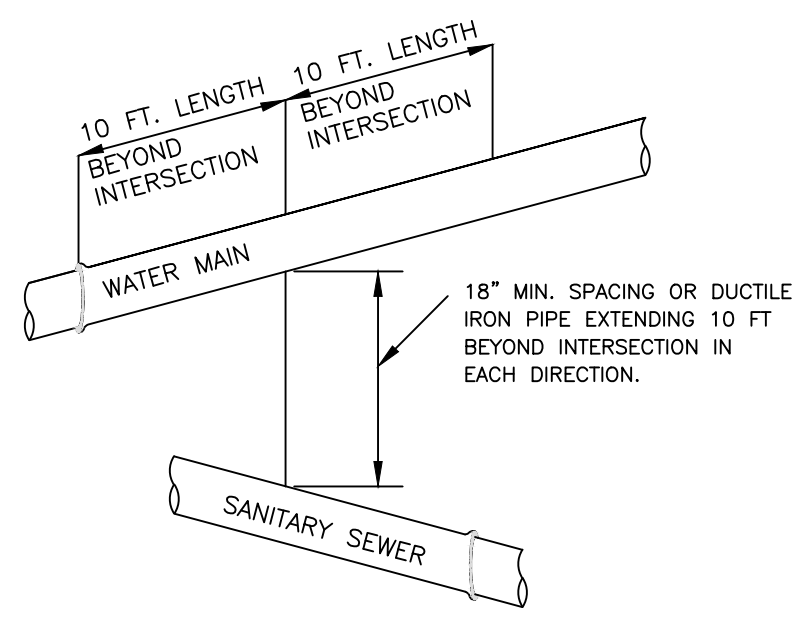
| TRENCH WIDTH | PIPE SIZE | "X" |
|--------------|-----------|-----|
| 4" THRU 12" | 30" | |
| 14" THRU 18" | 36" | |
| 20" THRU 24" | 42" | |
| 26" THRU 36" | 54" | |



CASE II
PAVED AREAS

NOTE:
CUTTING AND REPAIRING EXISTING PAVEMENT, CONCRETE OR GRAVEL SHALL BE IN ACCORDANCE WITH OWNERS REQUIREMENTS.

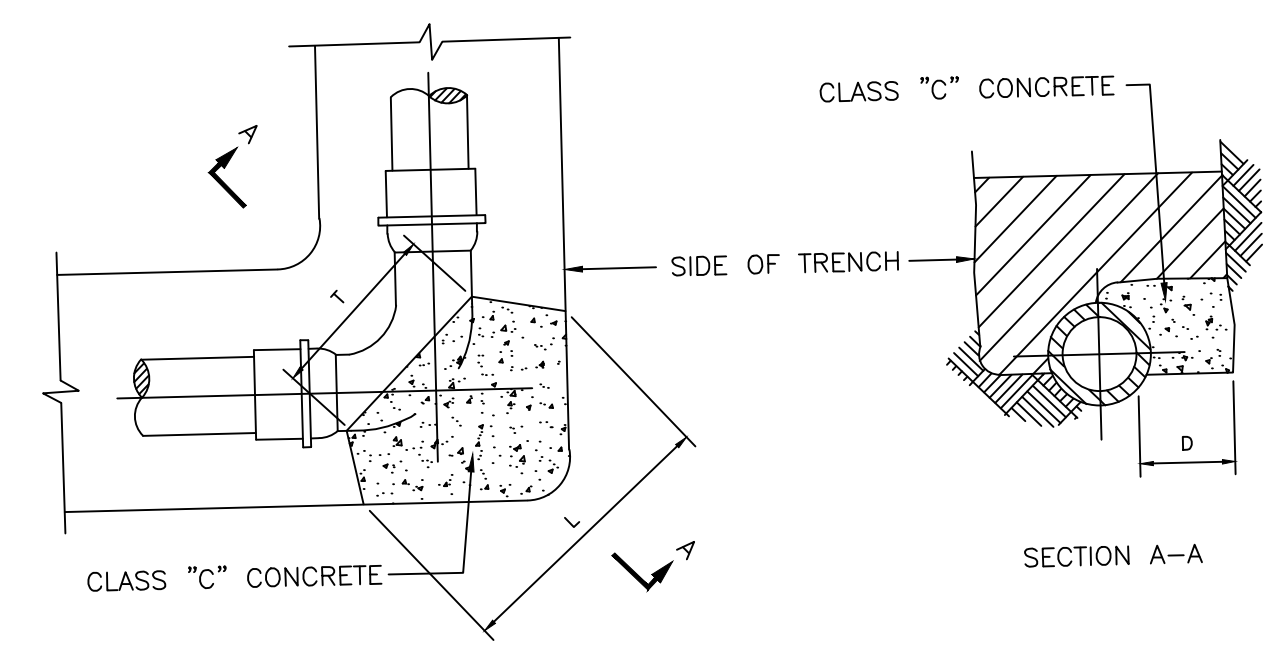
TYPICAL
BACK FILL & BEDDING METHODS
DWG. NO. SD-1
SEE SPEC. SECT. 02225



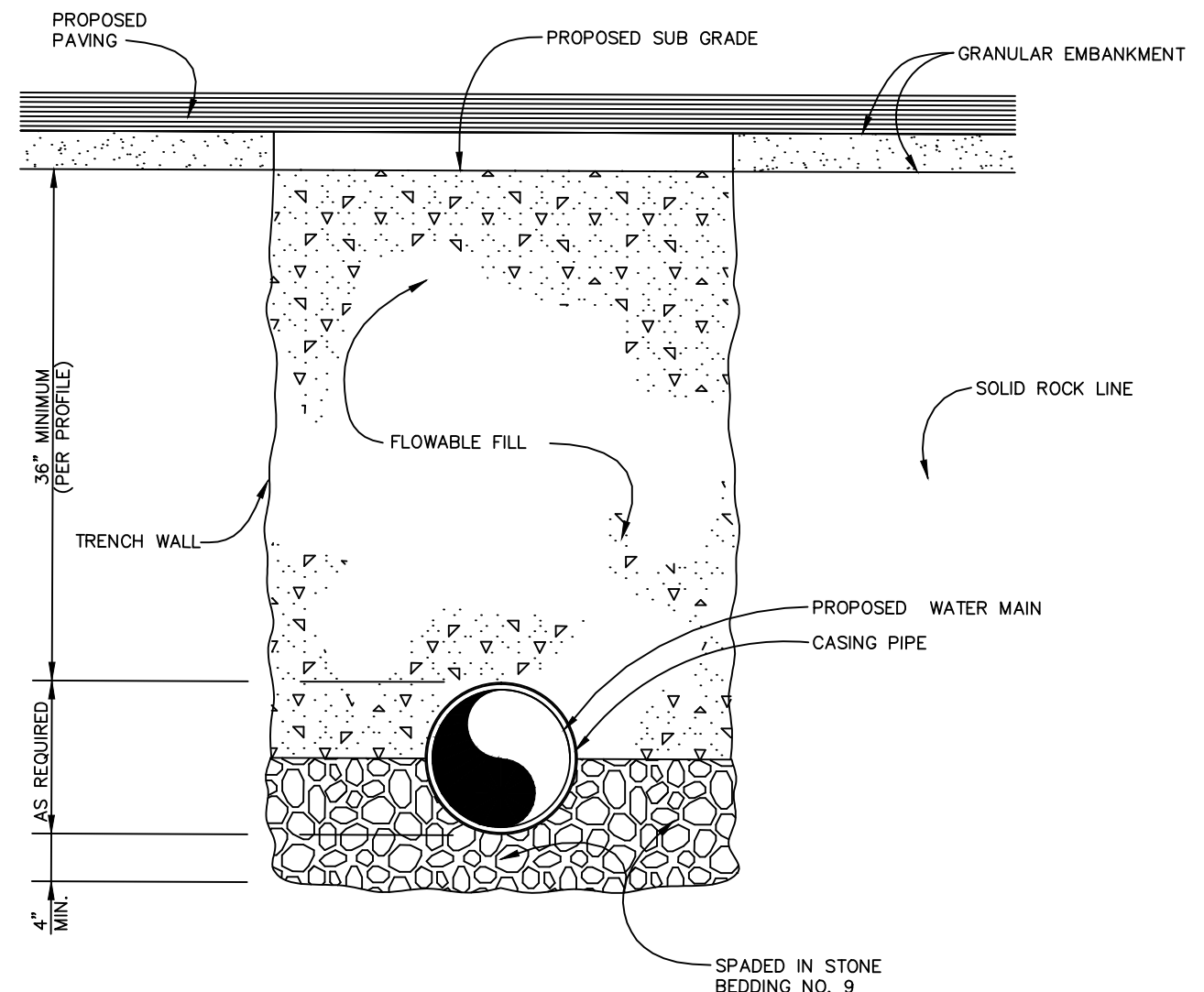
SANITARY SEWER CROSSING
CROSSING ARRANGED SO THAT SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM WATER MAIN JOINTS

THRUST BLOCK TABLE

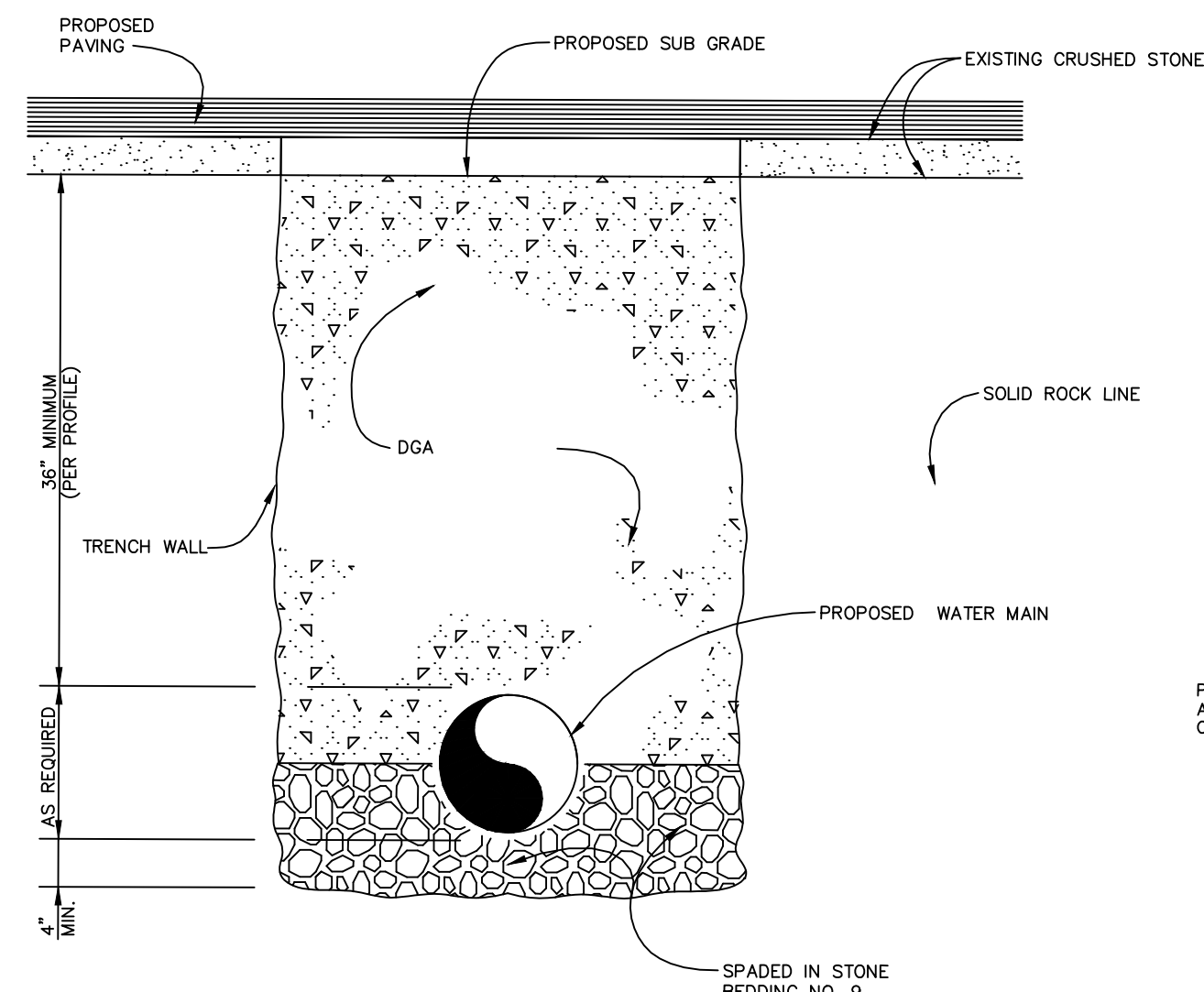
| PLUGS & TEES | | | | | | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 2" | 3" | 4" | 6" | 8" | 10" | 16" |
| D | 6" | 6" | 6" | 6" | 6" | 6" | 24" |
| L & W | 14" | 16" | 18" | 20" | 22" | 24" | 60" |
| (45°) EIGHTH BENDS | | | | | | | |
| SIZE | 2" | 3" | 4" | 6" | 8" | 10" | 16" |
| D | 6" | 6" | 6" | 6" | 6" | 6" | 24" |
| L | 12" | 14" | 16" | 18" | 20" | 22" | 60" |
| T | 10" | 12" | 14" | 16" | 18" | 18" | 24" |
| (90°) QUARTER BENDS | | | | | | | |
| SIZE | 2" | 3" | 4" | 6" | 8" | 10" | 16" |
| D | 6" | 6" | 6" | 8" | 20" | 12" | 24" |
| L | 15" | 18" | 21" | 24" | 27" | 30" | 72" |
| T | 10" | 12" | 14" | 16" | 18" | 20" | 24" |
| 22 1/2° BENDS | | | | | | | |
| SIZE | 2" | 3" | 4" | 6" | 8" | 10" | 16" |
| D | 6" | 6" | 6" | 8" | 20" | 12" | 18" |
| L | 15" | 18" | 21" | 24" | 27" | 30" | 60" |
| T | 10" | 12" | 14" | 16" | 18" | 20" | 24" |
| 11 1/4° BENDS | | | | | | | |
| SIZE | 2" | 3" | 4" | 6" | 8" | 10" | 16" |
| D | 6" | 6" | 6" | 8" | 20" | 12" | 18" |
| L | 15" | 18" | 21" | 24" | 27" | 30" | 36" |
| T | 10" | 12" | 14" | 16" | 18" | 20" | 24" |



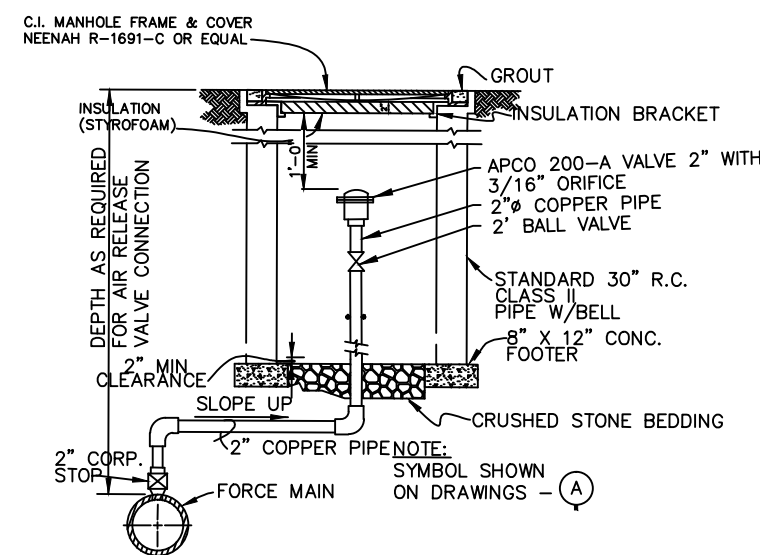
THRUST BLOCKS
45° & 90° BENDS



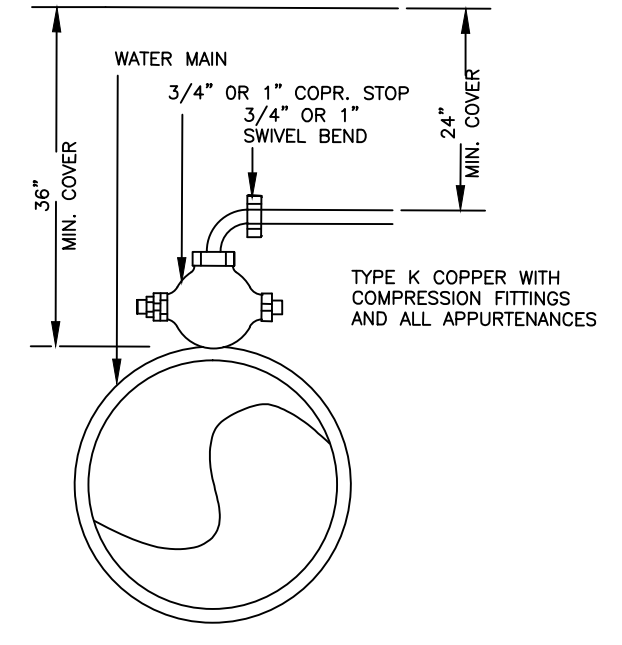
BACK FILL REQUIREMENT FOR
PIPE IN PROPOSED ROADWAY,
AND EXISTING CITY ROADWAY,
AND STATE HIGHWAY
NOT TO SCALE



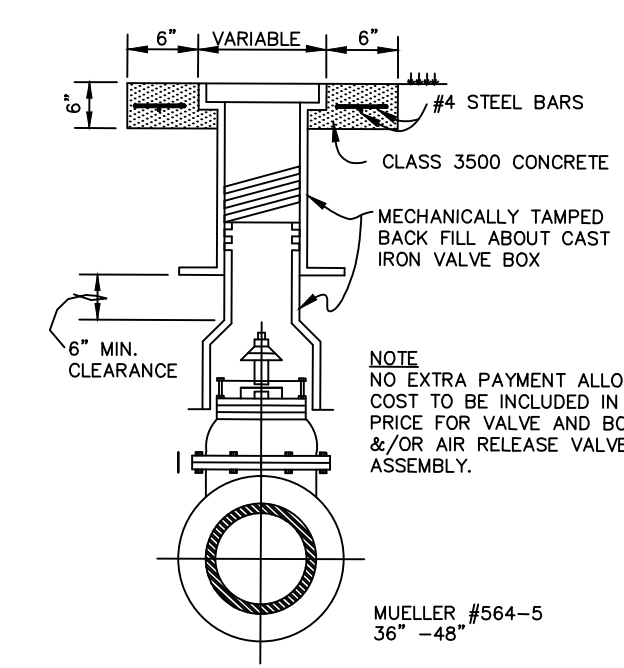
BACK FILL REQUIREMENT FOR
PIPE IN EXISTING CRUSHED
STONE DRIVES
NOT TO SCALE



DETAIL - AIR RELEASE
VALVE ASSEMBLY
FOR WATER MAIN
NOT TO SCALE



DETAIL OF WATER SERVICE CONNECTION
NOT TO SCALE

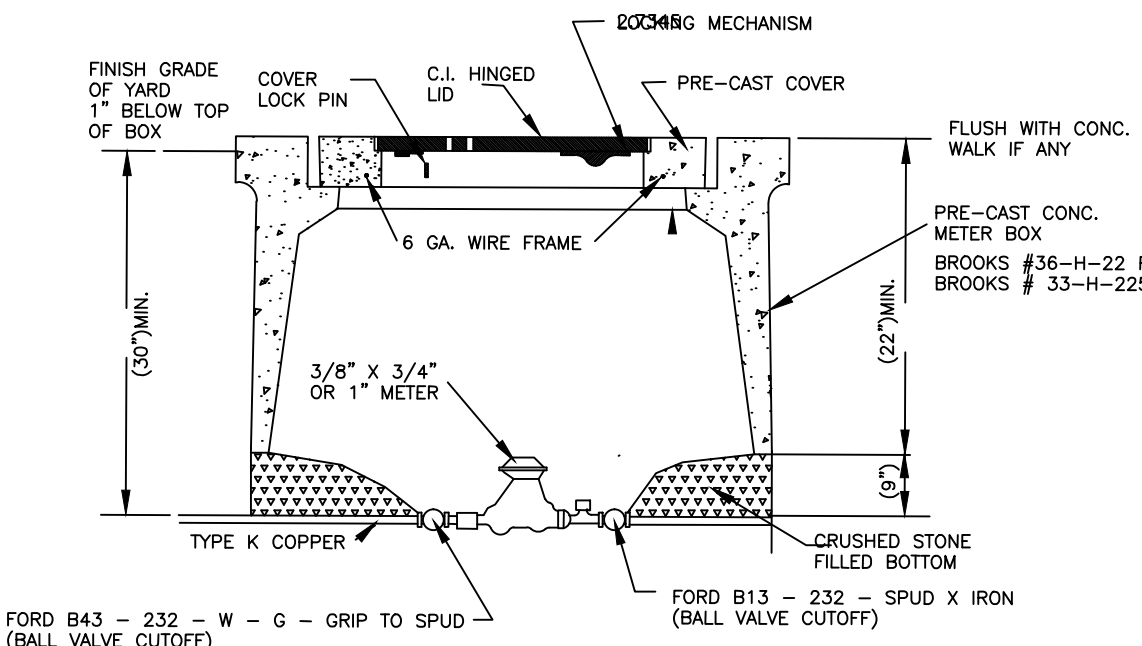


SECTION
VALVE BOX
N T S

NOTE:
THE PRICE BID FOR THE AIR COMBINATION VALVE ASSEMBLY SHALL INCLUDE THE CORPORATION STOP, TAPPING SADDLE, ISOLATION VALVE, COMBINATION AIR VALVE, ENCLOSURE, FRAME AND COVER AND CONNECTING PIPING, COMPLETE.

GENERAL NOTES FOR WATER MAINS.

- *MINIMUM COVER OVER WATER PIPE TO BE ONE METER 36" UNLESS OTHERWISE NOTED.
- *MINIMUM COVER OVER VALVE NUT TO BE (12") (NO PAYMENT FOR EXTRA DEPTH TRENCH). MAXIMUM COVER OVER VALVE NUTS TO BE (30") (NO EXTRA PAYMENT FOR REQUIRED EXTENSIONS).
- *CONCRETE BLOCKING OF FITTINGS REQUIRED AT NO EXTRA COST.
- *THE CONTRACTOR SHALL HAVE THE OPTION OF USING FITTINGS OR EXTRA DEPTH TRENCHING AT ALL LOCATIONS WHERE VERTICAL BENDS ARE SHOWN. EITHER METHOD WILL BE AT NO EXTRA COST TO OWNER ABOVE THAT BID FOR FURNISHING, TRENCHING, LAYING AND BACK FILLING PIPE AND FITTINGS, AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- *LAY NEW MAIN UNDER EXISTING WATER LINES AND GAS LINES, EXCEPT AS OTHERWISE NOTED OR DETERMINED IN THE FIELD. (NO PAYMENT FOR EXTRA DEPTH TRENCH).
- ALL D.I. PIPE TO BE CL. 52 OR C900 PVC PIPE.
- *PAYMENT FOR PIPE WILL BE FOR LENGTHS ACTUALLY INSTALLED AND MEASURED IN THE FIELD.
- *ANY SALVAGED MATERIALS WHICH HAVE NOT BEEN SPECIFIED TO BE REUSED SHALL BE REMOVED FROM THE JOB SITE BY THE CONTRACTOR AND PLACED AT AN OWNER DESIGNATED AREA AT NO EXTRA COST TO OWNER.
- *DISTANCES SHOWN ALONG PIPELINE ARE HORIZONTAL DISTANCES BETWEEN HORIZONTAL ANGLES OF 90° AND/OR MATCH LINES EXCEPT WHERE PROFILES ARE SHOWN. PAYMENT FOR PIPE WILL BE FOR LENGTHS ACTUALLY INSTALLED AND MEASURED IN THE FIELD.
- *LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE ONLY. EXACT LOCATIONS MUST BE DETERMINED BY CONTRACTOR BEFORE EXCAVATING FOR NEW FACILITIES.
- *WHEREVER POSSIBLE, FIRE HYDRANTS WILL BE LOCATED FOR MINIMUM DEPTH OF BURY. HOWEVER, EXTENSIONS REQUIRED FOR DEEPER INSTALLATIONS WILL BE AT NO EXTRA COST TO OWNER.
- *ALL TIE-IN LOCATIONS SHALL BE UNCOVERED PRIOR TO CONSTRUCTION TO MAINTAIN PROPER ALIGNMENT AND ELEVATION OF NEW CONNECTIONS.
- *CONTRACTOR IS RESPONSIBLE FOR INSTALLING DETECTOR TAPE AND 12 GAUGE COPPER TRACER WIRE THE LENGTH OF NEW CONSTRUCTION.
- *CONTRACTOR SHALL INVENTORY REQUIRED MATERIALS, TRENCH DEWATERING EQUIPMENT, AND ASSEMBLE IF NECESSARY ALL REQUIRED FITTINGS PRIOR TO CUT-INS OR TIE-INS SO TO INSURE MINIMUM DOWN TIME FOR CONNECTION.
- *SURFACE DRAINAGE SHALL BE MAINTAINED ON A DAY-BY-DAY BASIS.
- *THE CONTRACTOR WILL BE REQUIRED TO DISPOSE OF ALL EXCESS EXCAVATED MATERIAL FROM WATER MAIN AND SERVICE LINE CONSTRUCTION.
- *D.I.M.J. FITTINGS SHALL BE USED ON THIS PROJECT NO SUBSTITUTION WILL BE ALLOWED.



TYPICAL METER INSTALLATION
NOT TO SCALE

| STEEL CASING CHART | | | | |
|---------------------|----------|------------|----------------|------------|
| PIPE SIZE (NOMINAL) | BELL DIA | CASING (O) | WALL THICKNESS | MIN. COVER |
| 36" | 36.00" | 36.00" | 0.375" | 36" |
| 42" | 42.00" | 42.00" | 0.375" | 42" |
| 48" | 48.00" | 48.00" | 0.375" | 48" |
| 54" | 54.00" | 54.00" | 0.375" | 54" |
| 60" | 60.00" | 60.00" | 0.375" | 60" |
| 66" | 66.00" | 66.00" | 0.375" | 66" |
| 72" | 72.00" | 72.00" | 0.375" | 72" |
| 78" | 78.00" | 78.00" | 0.375" | 78" |
| 84" | 84.00" | 84.00" | 0.375" | 84" |
| 90" | 90.00" | 90.00" | 0.375" | 90" |

| | |
|-----------|-----------|
| SCALE: | |
| DATE: | JULY 2002 |
| JOB NO.: | |
| DESIGNED: | |
| DRAWN: | |
| CHECKED: | |
| Q/C: | |

OWNER APPROVAL:

BY:
TITLE:

REVISIONS:

NO.: DATE:

APPENDIX D

HOPKINS COUNTY

I-69

MP 105.09 to MP 106.48

Construction Number

FD04 SPP 054 0069 105-107

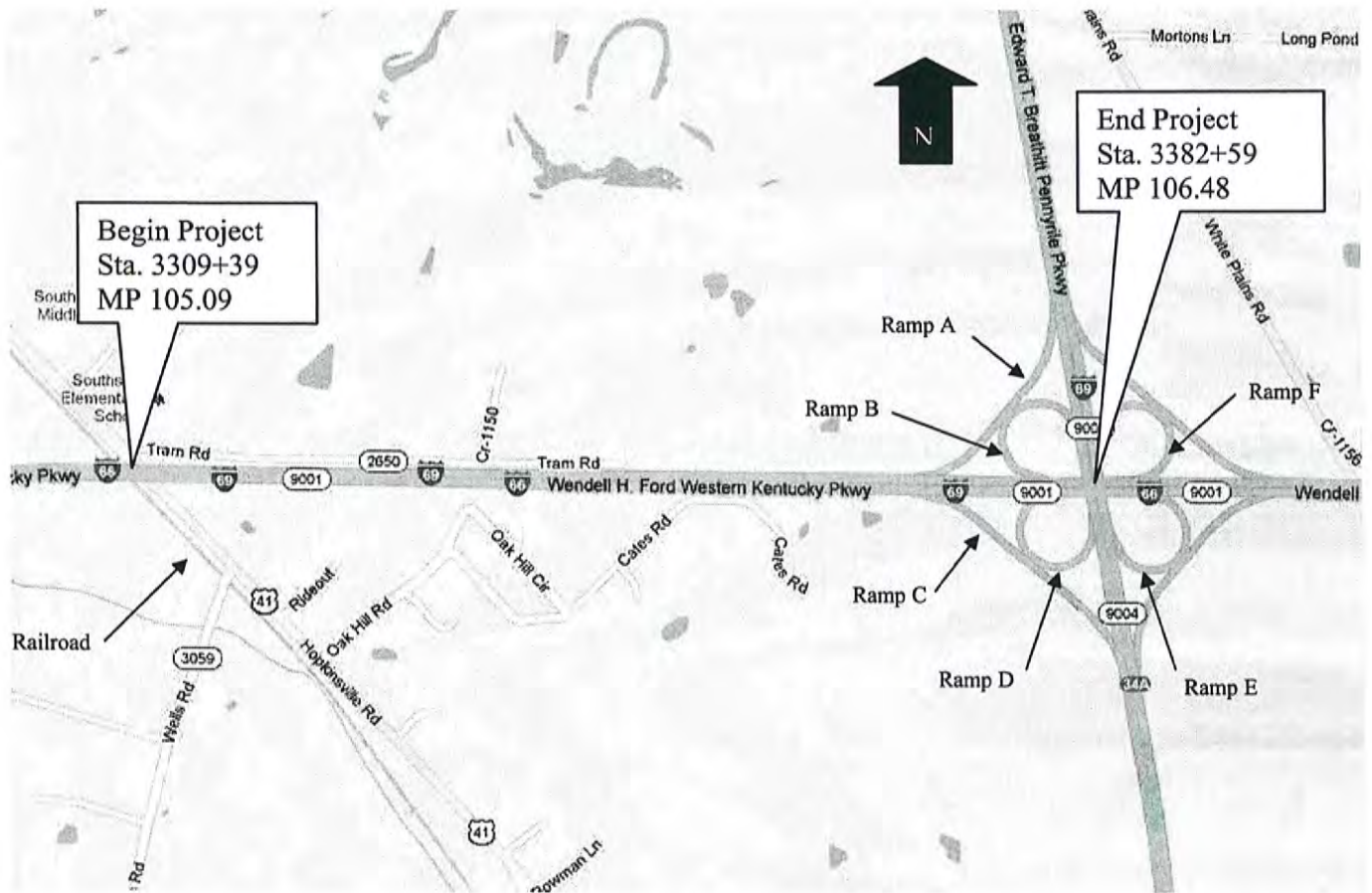
Item Number: 2-2067.00

**Prepared For The
Kentucky Transportation Cabinet**

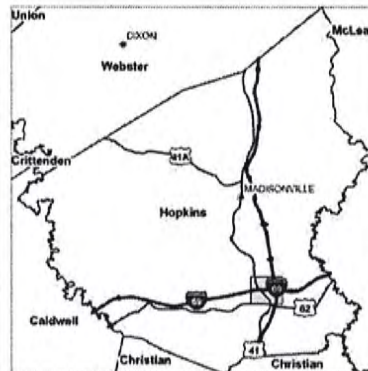
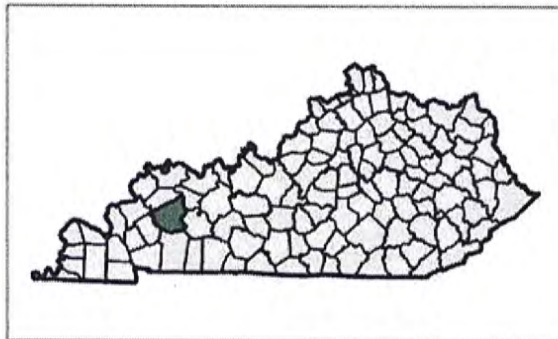


**Prepared By
WMB, INC.
CONSULTING ENGINEERS**

1950 Haggard Court
Lexington, Kentucky 40505
Ph. 859-299-5226



Not to Scale



Item Number: 2-2067.00

Construction Number: FD04 SPP 054 0069 105-107

Letting Date: _____

Recommended By: _____ Date: _____
Project Manager

Plan Approved By: _____ Date: _____
State Highway Engineer

TABLE OF CONTENTS

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|--|
| Cover Sheet |
| Layout Sheet |
| Table of Contents |
| Applicable Standard Drawings & Sepias, Additional Drawings |
| Applicable Special Notes |
| Typical Sections |
| General Summary |
| Paving Summary |
| Paving Areas Summary |
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| Bridge Slope Protection Repairs |
| Plan Sheets |
| General Notes |
| General Note 444 |
| General Note 447 |
| Traffic Control Plan |
| Maintenance of Traffic Typical Sections |
| Bridge Work Proposal |

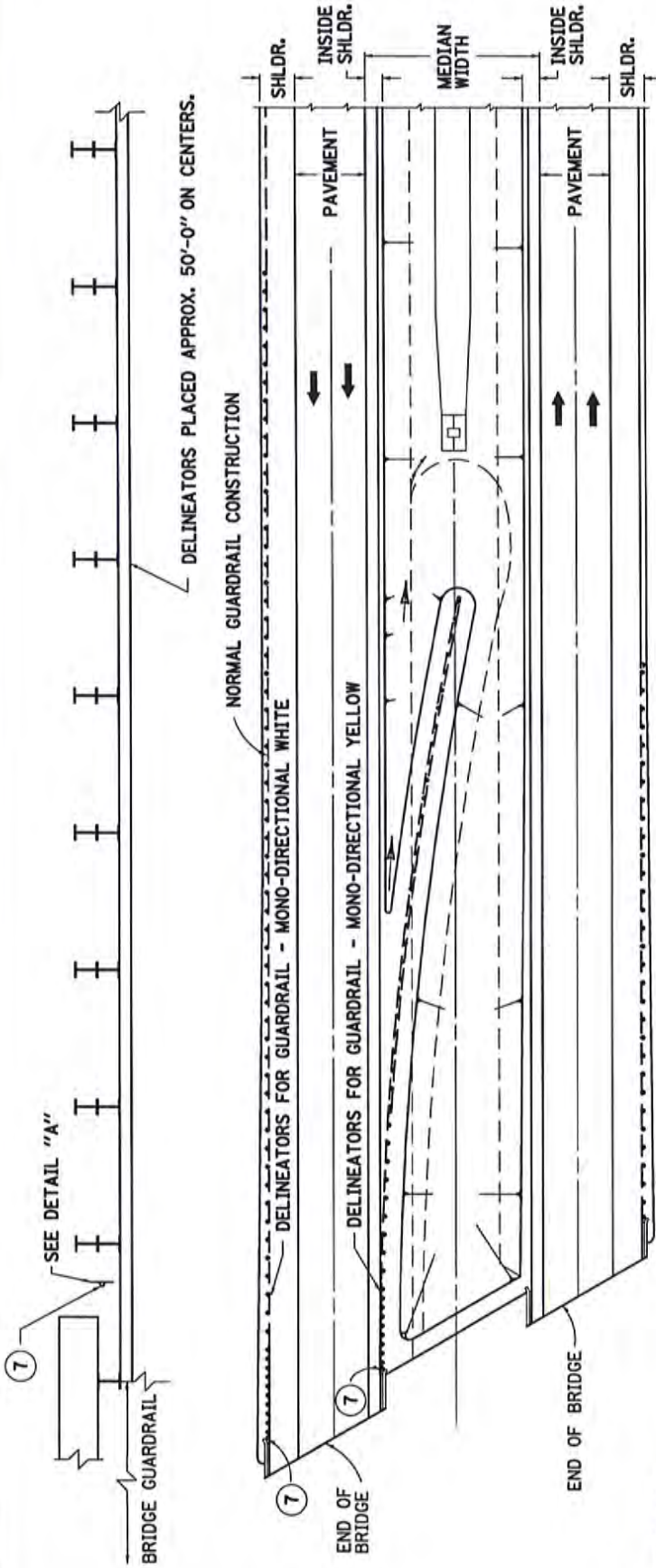
REFERENCES

1. Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction, Edition of 2012
2. FHWA Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition
3. Kentucky Department of Highways Standard Drawings, current editions, as applicable:
 - RBB-002-08 Guardrail And Bridge End Drainage For Twin Structures
 - RBB-003-02 Layout Of Guardrail At Twin Structures (Depressed Median)
 - RBB-010-04 Guardrail Transition From Normal Shoulder To Narrow Bridge
 - RBC-001-10 Guardrail Connector To Bridge End Type A And A-1
 - RBC-002-02 Guardrail Connector To Bridge End Type A Components
 - RBE-205-05 Crash Cushion Type IX-A
 - RBI-001-10 Typical Guardrail Installations
 - RBI-002-06 Typical Guardrail Installations
 - RBI-003-08 Typical Guardrail Installation for Guardrail End Treatment Type 2A
 - RBI-004-04 Installation Of Guardrail End Treatment Type 1
 - RBI-006-06 Guardrail Installation At Sign Supports
 - RBR-010-05 Guardrail Terminal Sections
 - RBR-020-05 Guardrail End Treatment Type 1
 - RDB-105-05 Sloped And Flared Box Inlet – Outlet 18" – 24" – 30" – 36" All Skews
 - RDB-106-04 Grates For Sloped And Flared Box Inlet – Outlet
 - RDB-280-05 Curb Box Inlet Type B (Detail Drawing)
 - RDB-281-02 Curb Box Inlet Type B (Steel Drawing)
 - RDB-282-03 Curb Box Inlet Type B (Top Phase Tables)
 - RDB-283-03 Curb Box Inlet Type B
 - RDB-400-04 Box Inlet Riser
 - RDB-410-05 Box Inlet Pipe Chamber
 - RDB-420-04 Box Inlet Pipe Chamber (Additional Steel)
 - RDD-021-07 Flume Inlet Type 2
 - RDD-040-04 Channel Lining Class II And III
 - RDP-010-08 Perforated Pipe Headwalls
 - RDX-001-05 Junction Box
 - RDX-002-03 Junction Box (Dimensions & Quantities)
 - RDX-210-02 Temporary Silt Fence
 - RDX-225 Silt Trap Type B
 - RDX-230 Silt Trap Type C
 - RDH-110-02 Pipe Culvert Headwalls 0° Skew
 - RDH-210-03 Dimensions & Quantities 30", 108" Headwalls – Circular Pipe, 0° Skew
 - RDH-310-04 Bill Of Reinforcement 30" To 90" Diameter Circular Pipe Headwalls 0° Skew
 - RPM-001-03 Permanent U-Turn Opening
 - RPM-100-09 Curb and Gutter, Curbs, and Valley Gutter
 - TPM-105-02 Pavement Marker Arrangements Multi-Lane Roadways
 - TPM-110-02 Pavement Marker Arrangements Multi-Lane Roadways
 - TPM-115-02 Pavement Marker Arrangement Two-Lane, Two-Way Roadways

- TPM-125-02 Pavement Marker Arrangement Exit Gore and Off-Ramp
- TPM-130-02 Pavement Marker Arrangement On-Ramp with Tapered Acceleration Lane
- TTC-115-02 Lane Closure Multi-Lane Highway Case I
- TTC-135-01 Shoulder Closure
- TTD-110-01 Post Splicing Detail
- TTD-120-01 Work Zone Speed Limit and Double Fine Signs
- TTD-125-01 Pavement Condition Warning Signs
- TTS-110-01 Mobile Operation for Paint Striping Case III
- TTS-115-01 Mobile Operation for Paint Striping Case IV

4. Kentucky Department of Highways Sepias, as applicable:

- Drawing No. 001 Delineators at Narrow Shoulder Bridges
- Drawing No. 002 Delineators for Guardrail
- Drawing No. 007 Guardrail End Treatment Type 2A
- Drawing No. 008 Guardrail Components
- Drawing No. 012 Steel Beam Guardrail-W Beam
- Drawing No. 013 Guardrail Posts
- Drawing No. 014 Guardrail Connector to Bridge End Type A and A-1 Components



NOTES:

1. DELINEATOR SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.

2. CODE PAY ITEM PAY UNIT

1984 DELINEATOR FOR CONCRETE BARRIERS EACH
 1985 DELINEATOR FOR BARRIER WALL - MONO-DIRECTIONAL WHITE EACH
 DELINEATOR FOR BARRIER WALL - MONO-DIRECTIONAL YELLOW EACH

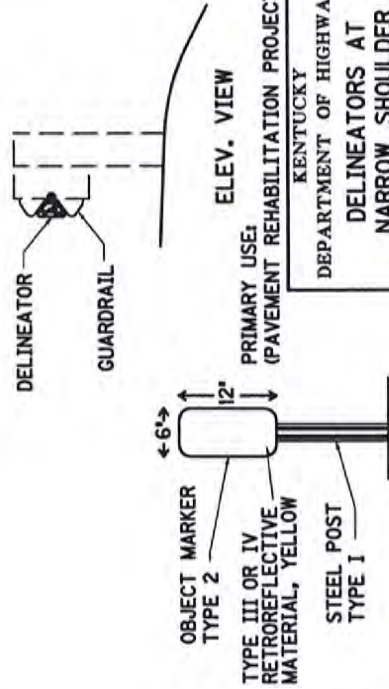
DELIMITERS ON GUARDRAIL
 1982 DELINEATOR FOR GUARDRAIL - MONO-DIRECTIONAL WHITE EACH
 1983 DELINEATOR FOR GUARDRAIL - MONO-DIRECTIONAL YELLOW EACH

3. THE DELINEATORS SHALL BE YELLOW IN COLOR WHEN THE BARRIER IS PLACED IN THE MEDIAN AND/OR ON THE LEFT SIDE OF THE DRIVING LANE. THE DELINEATORS SHALL BE WHITE IN COLOR WHEN THE BARRIER IS PLACED ON THE RIGHT SIDE OF THE DRIVING LANE.

4. DELINEATORS SHALL BE APPLIED 300 FEET IN ADVANCE OF AND THROUGHOUT THE LENGTH OF ALL BRIDGES THAT DO NOT HAVE FULL WIDTH SHOULDERS. SPACING ON BRIDGES AND 300 FEET IN ADVANCE OF BRIDGES SHALL BE 50 FEET ON CENTERS. THE FIRST DELINEATOR ON THE GUARDRAIL SHALL BE PLACED 50 FEET FROM THE DELINEATOR AT THE END OF THE BRIDGE. DELINEATORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. WHEN CONCRETE BARRIERS EXTEND ACROSS NARROW SHOULDER WIDTH STRUCTURES IN LIEU OF STEEL BEAM GUARDRAIL, DELINEATORS SHALL BE INSTALLED AT SAME VERTICAL ALIGNMENT AS ON THE GUARDRAIL AND DELINEATORS SHALL COMPLY WITH CURRENT SEPIA DRAWING 004.

6. GUARDRAIL DELINEATORS SHALL COMPLY WITH CURRENT SEPIA DRAWING 002.
 7. SEE SECTION 718 OF THE CURRENT STANDARD SPECIFICATIONS FOR "OBJECT MARKER TYPE 2".



OBJECT MARKER TYPE 2
 DETAIL "A" 7

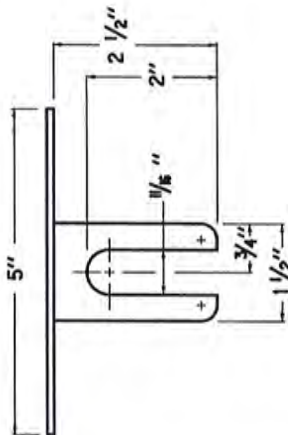
PRIMARY USE:
 (PAVEMENT REHABILITATION PROJECTS)
 KENTUCKY
 DEPARTMENT OF HIGHWAYS
 DELINEATORS AT
 NARROW SHOULDER
 BRIDGES

SUBMITTED: *[Signature]* DATE: 6-15-2012
 DIRECTOR OFFICE OF ACCOUNT RELS. 001

NOTES

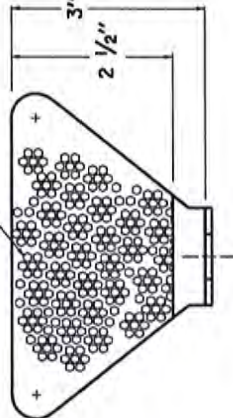
1. THE DELINEATOR'S SHAPE AND DIMENSIONS ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY. TYPES OF DELINEATORS PERMITTED SHALL BE FROM THE LIST OF APPROVED MATERIALS.
2. DELINEATOR SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
3. PAY ITEM

| | | |
|------|---|------|
| 1982 | DELINEATOR FOR GUARDRAIL - MONO DIRECTIONAL WHITE DELINEATOR FOR GUARDRAIL | EACH |
| 1983 | DELINEATOR FOR GUARDRAIL - MONO DIRECTIONAL YELLOW DELINEATOR FOR GUARDRAIL | EACH |
| 1987 | DELINEATOR FOR GUARDRAIL - BI-DIRECTIONAL WHITE DELINEATOR FOR GUARDRAIL | EACH |
4. GUARDRAIL DELINEATORS SHALL BE REQUIRED ON ALL GUARDRAIL.
5. DELINEATORS SHALL BE MANUFACTURED FROM 12 GA. GALVANIZED STEEL.
6. DIMENSIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MANUFACTURER'S TOLERANCES.
7. WHEN CONCRETE BARRIERS EXTEND ACROSS BRIDGE STRUCTURES IN LIEU OF STEEL BEAM GUARDRAIL, DELINEATORS SHALL BE INSTALLED AT SAME VERTICAL ALIGNMENT AS ON THE GUARDRAIL, AND DELINEATORS SHALL COMPLY WITH CURRENT SEPIA DRAWING 004.
8. DELINEATORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

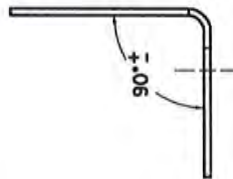


PLAN VIEW

TYPE XI SHEETING,
YELLOW OR WHITE

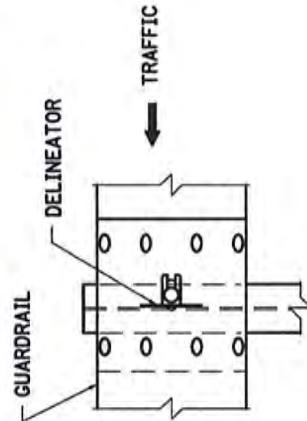


FRONT VIEW

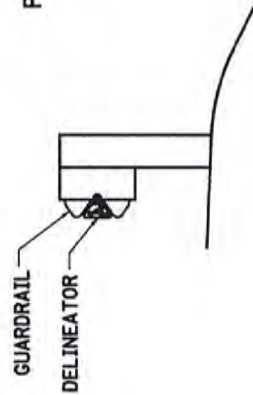


SIDE VIEW

NOTE: DIMENSIONS SHOWN ARE FOR ONE VERSION OF A WEB-MOUNTED GUARDRAIL DELINEATOR. DELINEATORS WITH ALTERNATE DIMENSIONS MAY BE CONSIDERED FOR INCLUSION ON THE APPROVED PRODUCTS LIST.



FRONT VIEW



SIDE VIEW

BI-DIRECTIONAL WHITE DELINEATOR
FOR GUARDRAIL FACING TRAFFIC



BI-DIRECTIONAL WHITE DELINEATOR
FOR GUARDRAIL FACING TRAFFIC

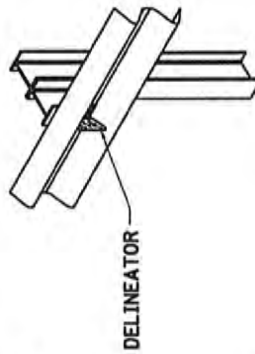


MONO-DIRECTIONAL WHITE DELINEATOR
FOR GUARDRAIL FACING TRAFFIC



MONO-DIRECTIONAL YELLOW DELINEATOR
FOR GUARDRAIL FACING TRAFFIC

PLACEMENT OF DELINEATORS
FOR GUARDRAIL



ISOMETRIC VIEW

| APPROXIMATE DELINEATOR SPACING | |
|--------------------------------|------|
| TANGENT | 100' |
| CURVE | 50' |

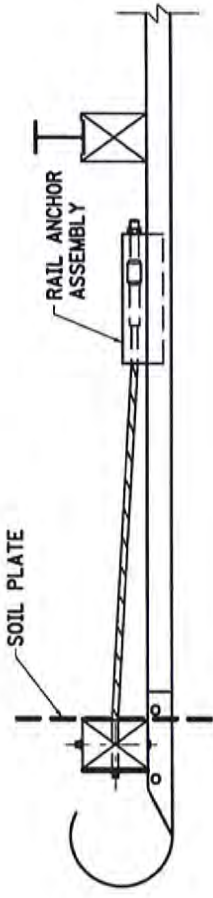
SPACING SHOULD BE ADJUSTED IN CURVES SO THAT SEVERAL DELINEATORS ARE ALWAYS SIMULTANEOUSLY VISIBLE TO THE ROAD USER.

KENTUCKY
DEPARTMENT OF HIGHWAYS

DELINEATORS
FOR GUARDRAIL

SUBMITTED: *[Signature]* 6-15-2012
DATE: 6-15-2012
DESIGNER: DIVISION OF DESIGN

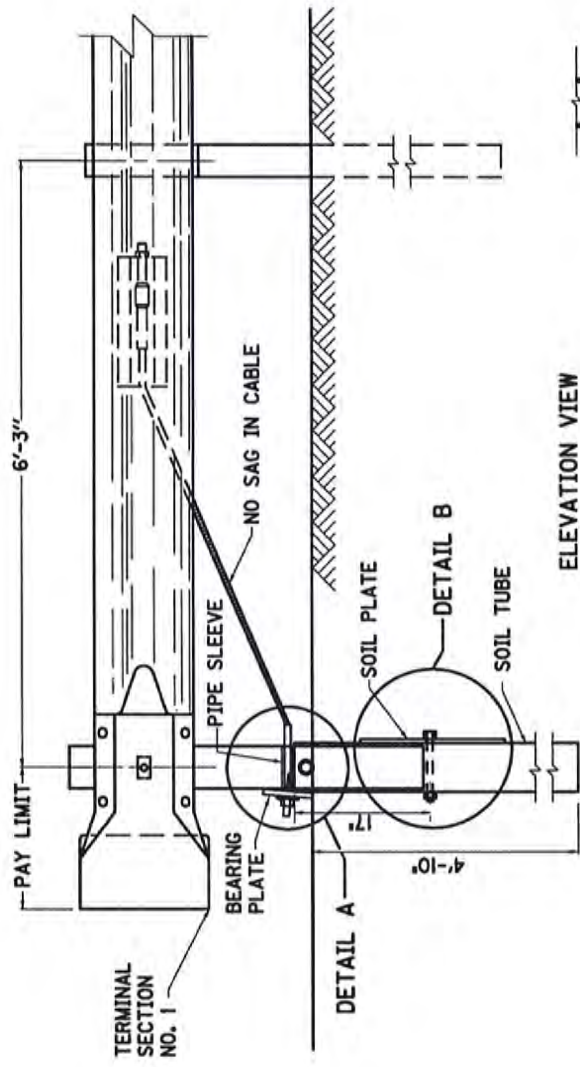
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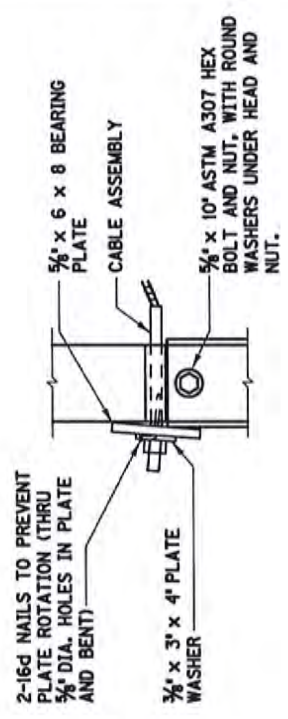
PLAN VIEW

NOTES

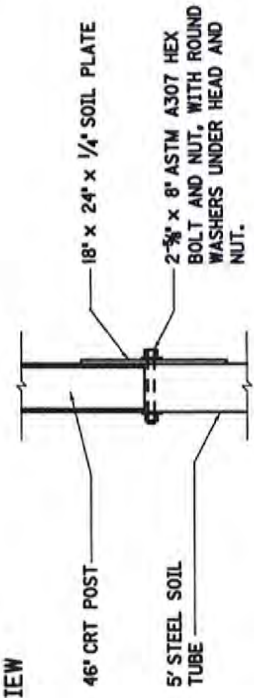
1. GUARDRAIL END TREATMENT TYPE 2A SHALL BE TO THE PAY LIMITS AS DETAILED. THE CONTRACT UNIT BID IS EACH AND SHALL INCLUDE A TERMINAL SECTION NO. 1, RAIL ANCHOR ASSEMBLY, CABLE ANCHOR ASSEMBLY AND ALL OTHER INCIDENTALS NECESSARY FOR A COMPLETE INSTALLATION AS DETAILED.
2. IN THE EVENT SOLID ROCK IS ENCOUNTERED, THE SOIL TUBE MAY BE SHORTENED, PROVIDED IT EXTENDS INTO THE SOLID GROUND A MINIMUM OF 3 FEET.
3. INSTALL BEARING PLATE SO THAT THE "V" OPENING IS AT THE TOP.



ELEVATION VIEW



DETAIL A



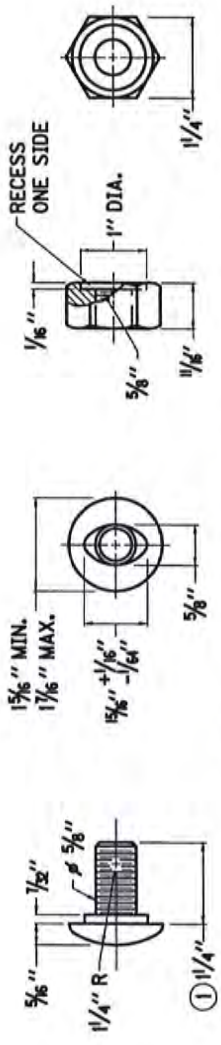
DETAIL B

USE WITH CUR. STD. DWGS.
RBR-010, RBI-001,
RBI-002, RBI-003

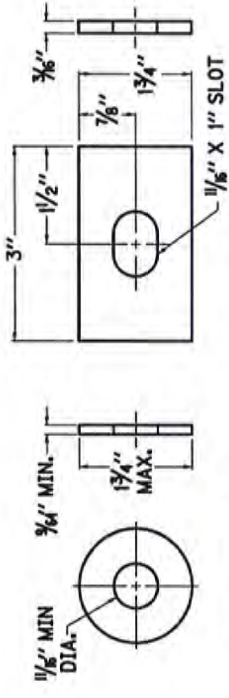
| |
|---|
| KENTUCKY DEPARTMENT OF HIGHWAYS |
| GUARDRAIL END TREATMENT TYPE 2A |
|  <small>DATE</small> 6-15-2012 <small>YEAR</small> 2012 <small>REVISION</small> |
| 007 |

NOTES

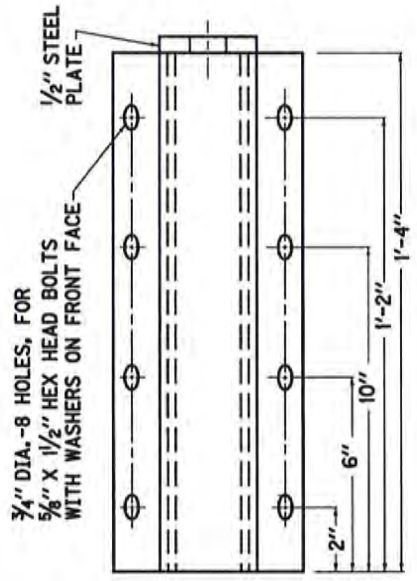
- ① RAIL BOLT SIMILAR EXCEPT LENGTH.
- ② THE THRIE BEAM TO "W" BEAM CONNECTOR SHALL COMPLY WITH AASHTO M-180 CLASS A, TYPE 2 EXCEPT WHERE IN CONFLICT WITH THIS DETAIL.



5/8" BUTTON HEAD BOLT AND RECESSED NUT

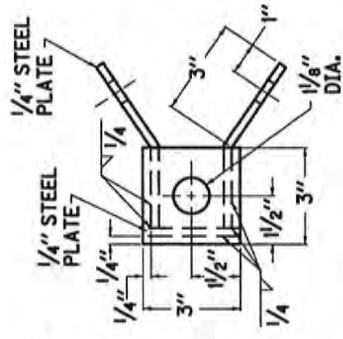


ROUND WASHER AND RECTANGULAR PLATE WASHER

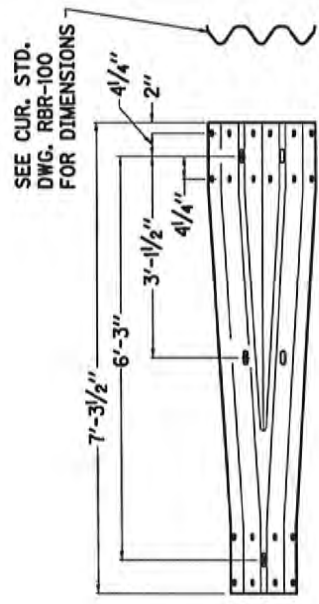
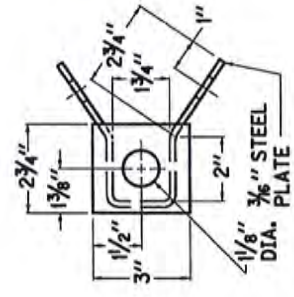


3/4" DIA. - 8 HOLES, FOR 5/8" X 1/2" HEX HEAD BOLTS WITH WASHERS ON FRONT FACE

ALTERNATE NO. 1



ALTERNATE NO. 2



SEE CUR. STD. DWG. RBR-100 FOR DIMENSIONS

SEE CUR. STD. DWG. RBR-001 FOR DIMENSIONS

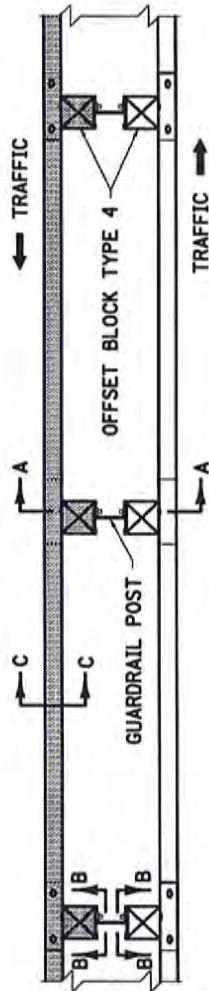
THRIE BEAM TO "W" BEAM CONNECTOR ②

| | |
|--|-------------------------|
| KENTUCKY DEPARTMENT OF HIGHWAYS | GUARDRAIL COMPONENTS |
| SUBMITTED: <i>[Signature]</i> DATE: 6-15-2012 | 008 |

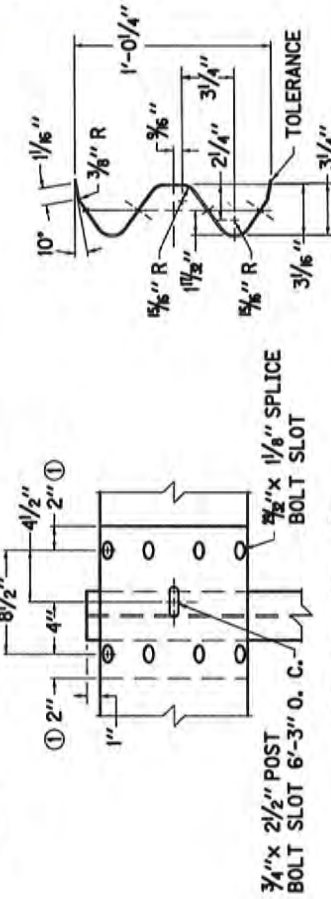
RAIL ANCHOR ASSEMBLY



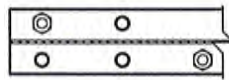
ELEVATION VIEW



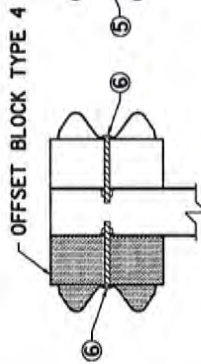
PLAN VIEW
(DOUBLE FACE RAIL OR SINGLE FACE RAIL)



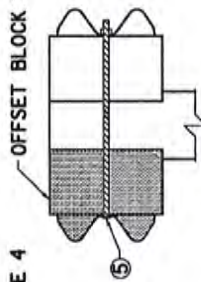
RAIL SPLICE ②



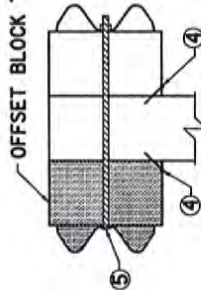
SECTION B-B



SECTION A-A
DOUBLE FACE RAIL WITH
STEEL POST (W6x9)
(TIMBER OFFSET BLOCK)



SECTION A-A
DOUBLE FACE RAIL WITH
ROUND TIMBER POST



SECTION A-A
DOUBLE FACE RAIL WITH
TIMBER POST

SECTION C-C
(RAIL CORRUGATED
SHEET STEEL BEAM)

OFFSET BLOCK TYPE 3

NOTES

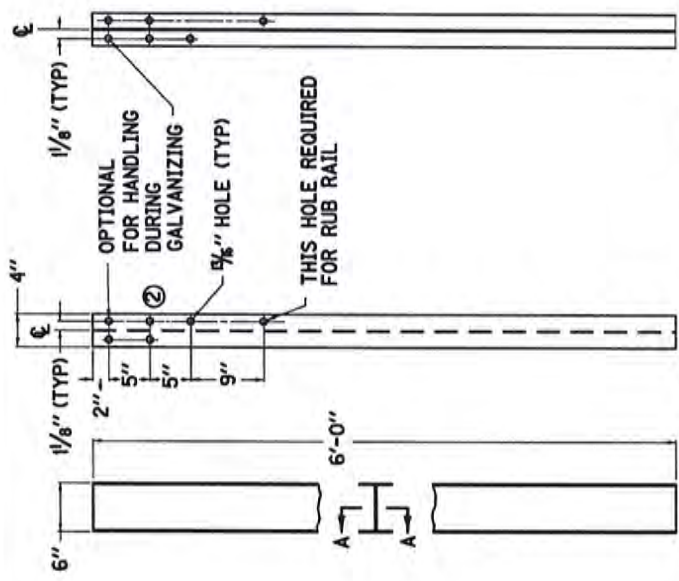
THE CONTRACT UNIT PRICE BID SHALL BE:
 GUARDRAIL-STEEL W BEAM-SINGLE FACE - LIN. FT.
 OR
 GUARDRAIL-STEEL W BEAM-DOUBLE FACE - LIN. FT.
 DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE
 INTENDED TO BE THOSE CONSISTENT WITH THE PROPER
 FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE
 AND ACCEPTED MANUFACTURING PRACTICES.
 THE RAIL ELEMENT SHALL COMPLY WITH AASHTO M-180
 -CLASS A, TYPE II.

ALL LAPS SHALL BE PLACED IN THE DIRECTION OF TRAFFIC
 FLOW.

- ① TOLERANCE + 1/4", -1/4"
- ② 8 - 5/8" x 1 1/2" LONG BUTTON HEAD BOLTS AND HEX HEAD
 RECESS NUTS REQUIRED FOR EACH RAIL SPLICE.
- ③ LENGTH EQUALS POST AND BLOCK WIDTH PLUS: 2"
 FOR BOLT OR 2 1/4" FOR THREADED ROD.
- ④ GALVANIZED STEEL 10G COMMON COATED NAIL (DRIVE
 NAIL AT THE TOP OR BOTTOM CENTER OF BLOCK AND
 POST AFTER BOLT IS INSTALLED).
- ⑤ 5/8" x ③ STEEL THREADED ROD AND TWO (2) HEX
 HEAD NUTS OR 5/8" x ③ BUTTON OR HEX HEAD BOLT
 AND HEX HEAD NUT.
- ⑥ 5/8" x 8" BUTTON HEAD BOLT, HEX HEAD RECESS NUT
 AND ONE 5/8" ROUND WASHER (TYP.). BOLT SHALL HAVE
 A MINIMUM THREAD LENGTH OF 2".
 [] REQUIRED FOR DOUBLE RAIL.
- 7 BOTH 12'-6" AND 25' LENGTHS OF "W" BEAM GUARDRAIL
 SECTIONS WILL BE PERMITTED UNLESS OTHERWISE
 DIRECTED BY THE ENGINEER.

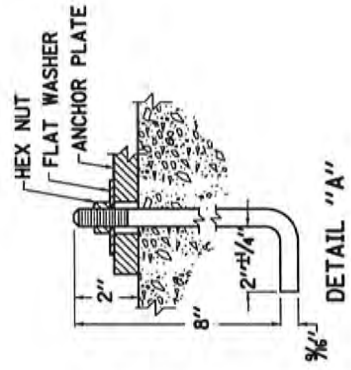
| | |
|--|--|
| KENTUCKY DEPARTMENT OF HIGHWAYS | STEEL BEAM GUARDRAIL ("W" BEAM) |
| SUBMITTED: DIRECTOR, DIVISION OF DESIGN | 12-11-12 DATE |
| 012 | |

- ~ NOTES ~
- ① W6 X 8.5 IS AN ACCEPTABLE ALTERNATE.
 - ② THESE HOLES REQUIRED FOR ATTACHING RAIL.

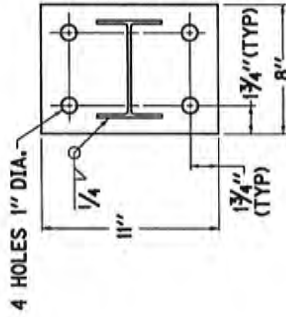


SECTION A-A
FRONT VIEW
SIDE VIEW

~ W6 X 9.0 STEEL POST ① ~

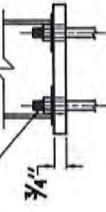


DETAIL "A"

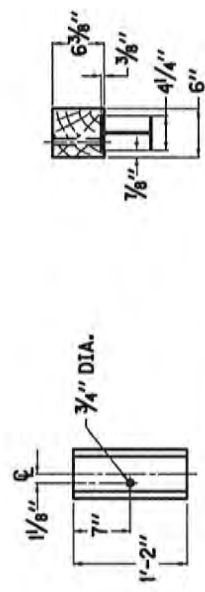


PLAN VIEW

SEE DETAIL "A"




SIDE VIEW
ANCHOR PLATE

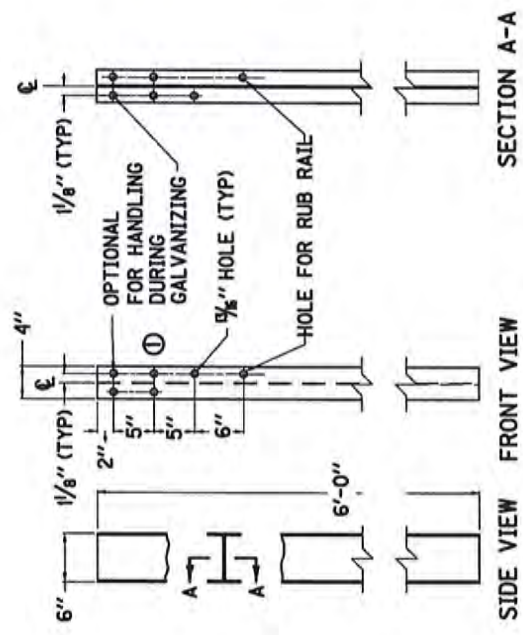


REAR ELEVATION
PLAN VIEW

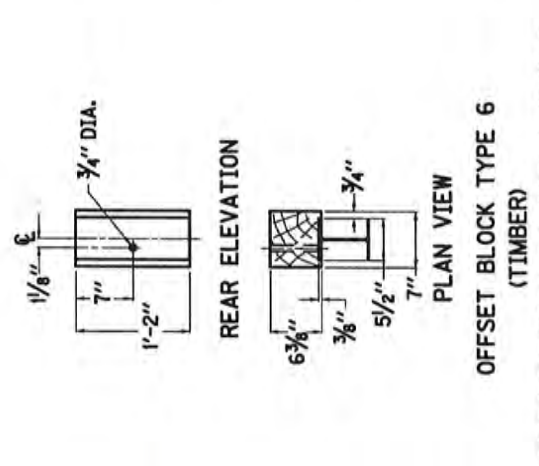
OFFSET BLOCK TYPE 4
(TIMBER)

(FOR USE WITH STEEL POST ONLY)

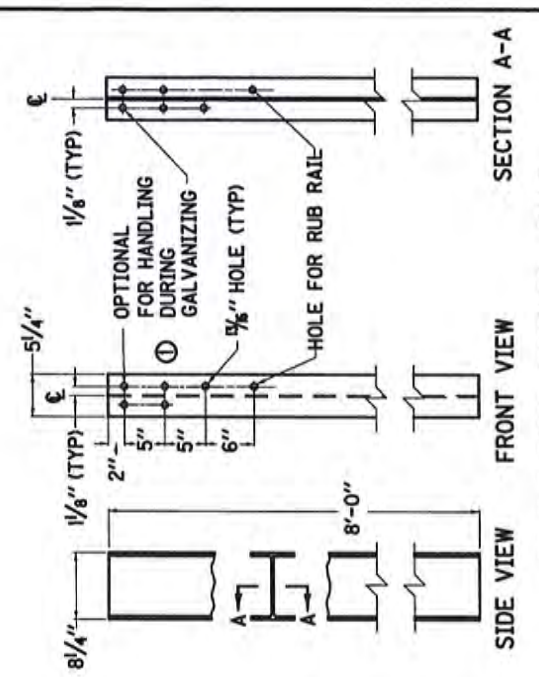
| |
|---|
| KENTUCKY DEPARTMENT OF HIGHWAYS |
| GUARDRAIL POSTS |
| SUBMITTED:  DIRECTOR, DIVISION OF DESIGN DATE: 9-27-13 013 |



~ W6 X 9.0 STEEL GUARDRAIL POST ~
(USED WITH C6 X 8.2 RUB RAIL)

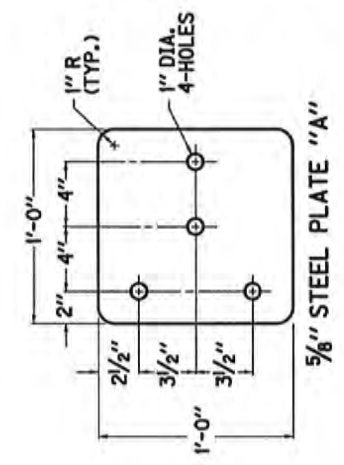


OFFSET BLOCK TYPE 6
(TIMBER)
(FOR USE WITH W8 X 21 STEEL POST ONLY)

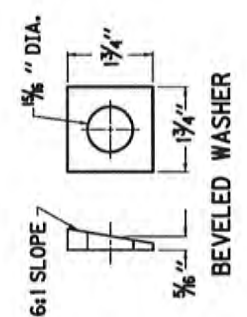


~ W8 X 21 STEEL GUARDRAIL POST ~

~ NOTES ~
① THESE HOLES REQUIRED FOR ATTACHING RAIL.

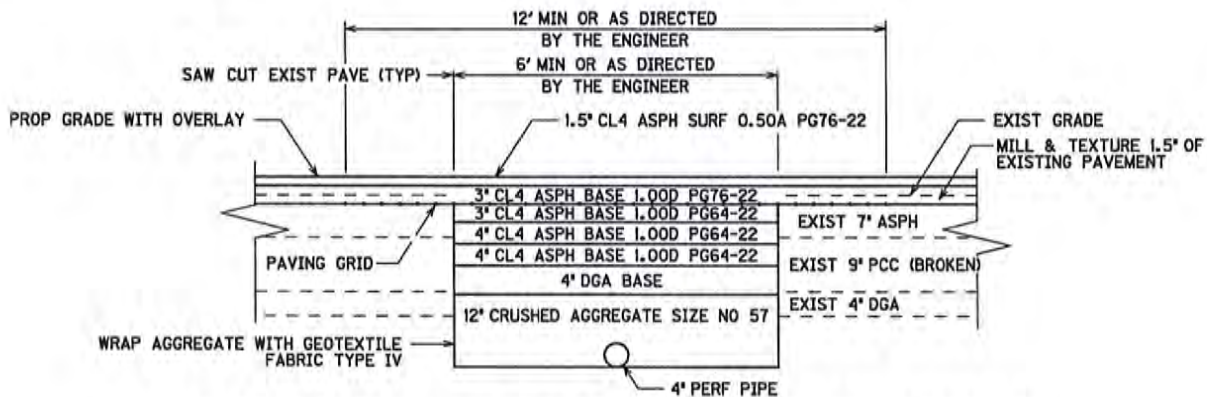


5/8" STEEL PLATE "A"

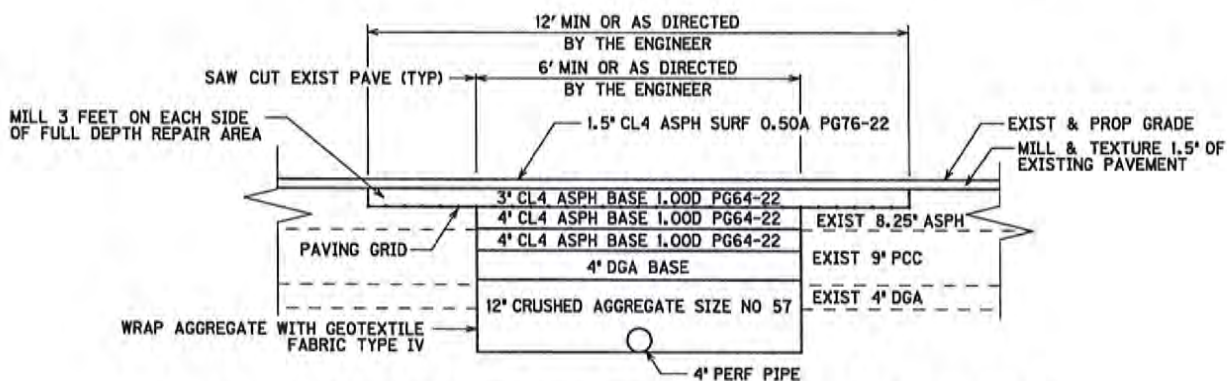


BEVELED WASHER

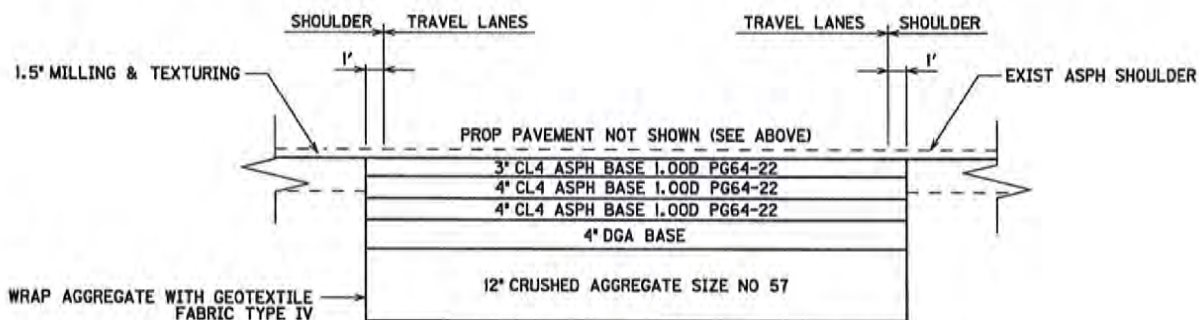
| | |
|--|---|
| KENTUCKY DEPARTMENT OF HIGHWAYS GUARDRAIL CONNECTOR TO BRIDGE END TYPE A AND A-1 COMPONENTS | SUBMITTED: <i>[Signature]</i> DIRECTOR, DIVISION OF DESIGN DATE: 9-27-13 014 |
|--|---|



I-69 SB BLOW-UP/RELIEF JOINT REPAIR PROFILE



I-69 NB BLOW-UP/RELIEF JOINT REPAIR PROFILE



I-69 BLOW-UP/RELIEF JOINT REPAIR X-SECT

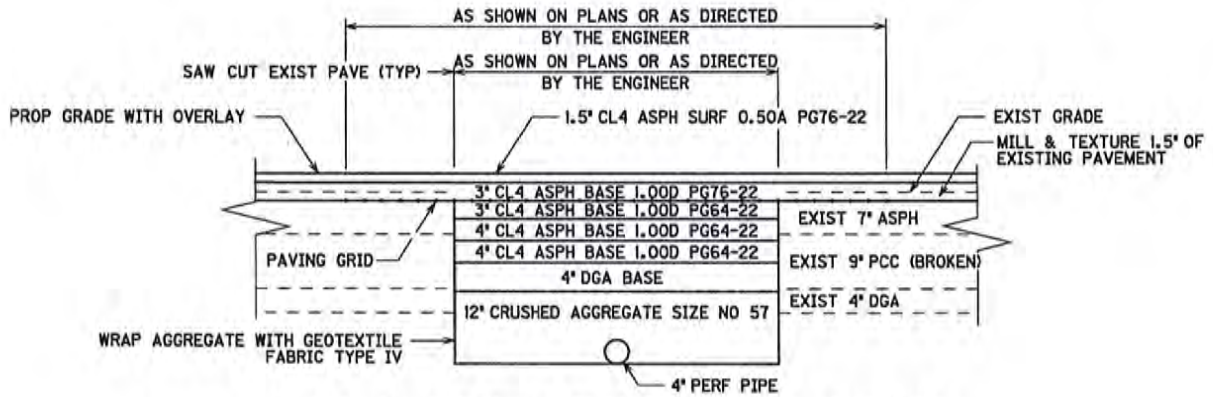
NOTES:

The locations and dimensions for 'Blow-Up/Relief Joint Repair' will be determined by the Engineer in the field. Before removal of the existing material, saw cuts shall be made in sound concrete pavement to each side of the joint to be repaired no closer than four feet to an existing joint. If existing joints are not apparent, the Engineer will determine the actual location of the saw cut.

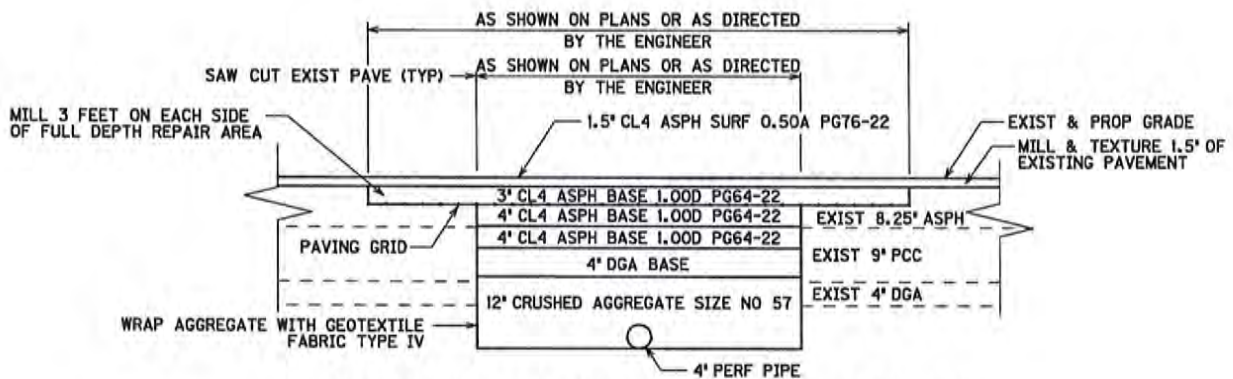
Once all existing material has been removed, the backfill material shall be compacted to the proper density for each course being placed as required by the Standard Specifications. The transverse underdrain (4" perforated pipe) shall not be wrapped and only course aggregate shall be used.

The perforated pipe shall drain toward and be tied into the Longitudinal Edge Drain System or outletted to a separate headwall.

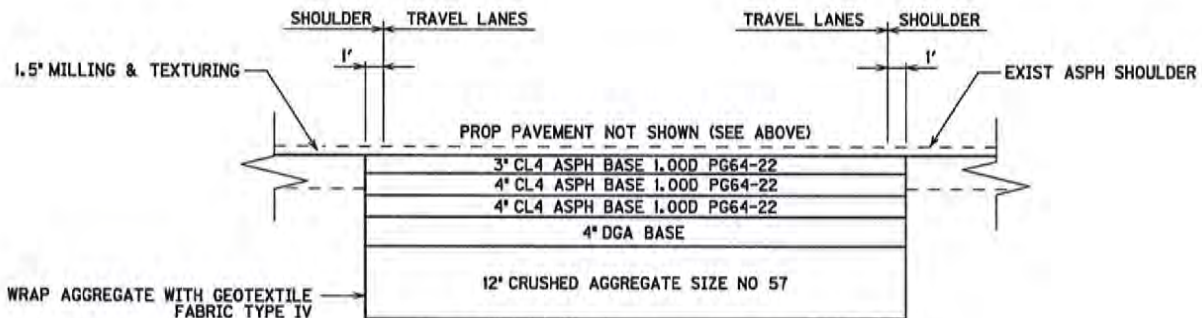
The contract unit bid price per SQ YD for 'Blow-Up/Relief Joint Repair' shall include: milling and texturing, saw cutting, removing pavement, roadway excavation, perforated pipe, No. 57's, geotextile fabric type IV, class 4 asphalt base, paving grid and all incidentals necessary to complete the installation as detailed. The pay quantity is the area of full depth replacement. Any additional milling and paving shown for the repair, will be incidental to this quantity.



I-69 SB BASE FAILURE REPAIR PROFILE



I-69 NB BASE FAILURE REPAIR PROFILE



I-69 BASE FAILURE REPAIR X-SECT

NOTES:

The locations and dimensions for 'Base Failure Repair' will be determined by the Engineer in the field. Before removal of the existing material, saw cuts shall be made in sound concrete pavement to each side of the joint to be repaired no closer than four feet to an existing joint. If existing joints are not apparent, the Engineer will determine the actual location of the saw cut.

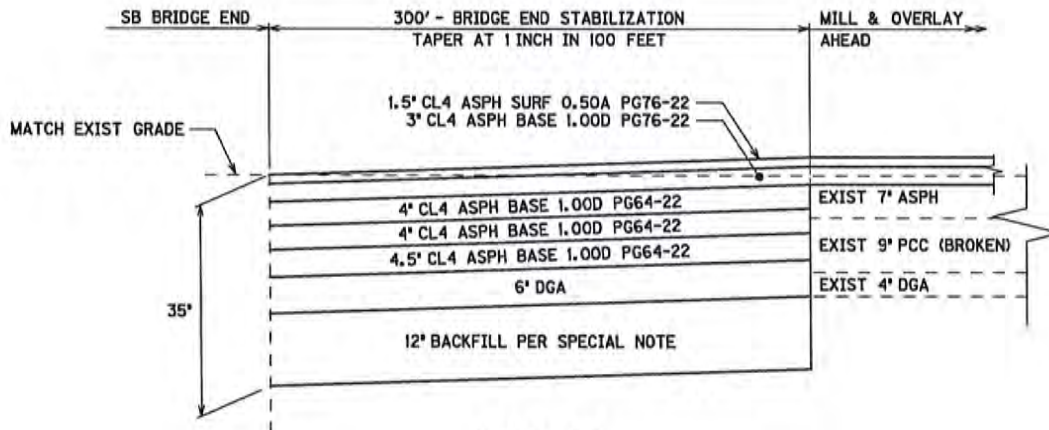
Once all existing material has been removed, the backfill material shall be compacted to the proper density for each course being placed as required by the Standard Specifications. The transverse underdrain (4" perforated pipe) shall not be wrapped and only course aggregate shall be used.

The perforated pipe shall drain toward and be tied into the Longitudinal Edge Drain System or outletted to a separate headwall.

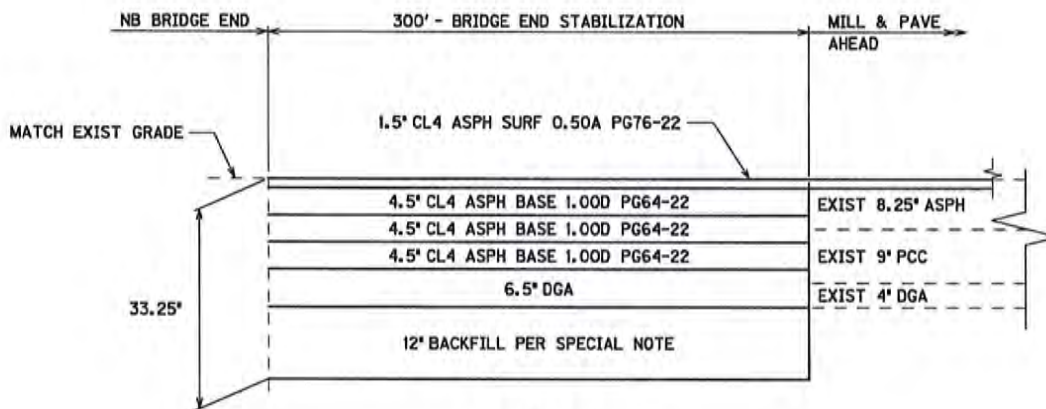
The contract unit bid price per SQ YD for 'Base Failure Repair' shall include: milling and texturing, saw cutting, removing pavement, roadway excavation, perforated pipe, No. 57's, geotextile fabric type IV, class 4 asphalt base, paving grid and all incidentals necessary to complete the installation as detailed. The pay quantity is the area of full depth replacement. Any additional milling and paving shown for the repair, will be incidental to this quantity.

I-69 BRIDGE END STABILIZATION PROFILES

SEE SPECIAL NOTE FOR ROADBED STABILIZATION AT BRIDGE ENDS FOR DETAILS

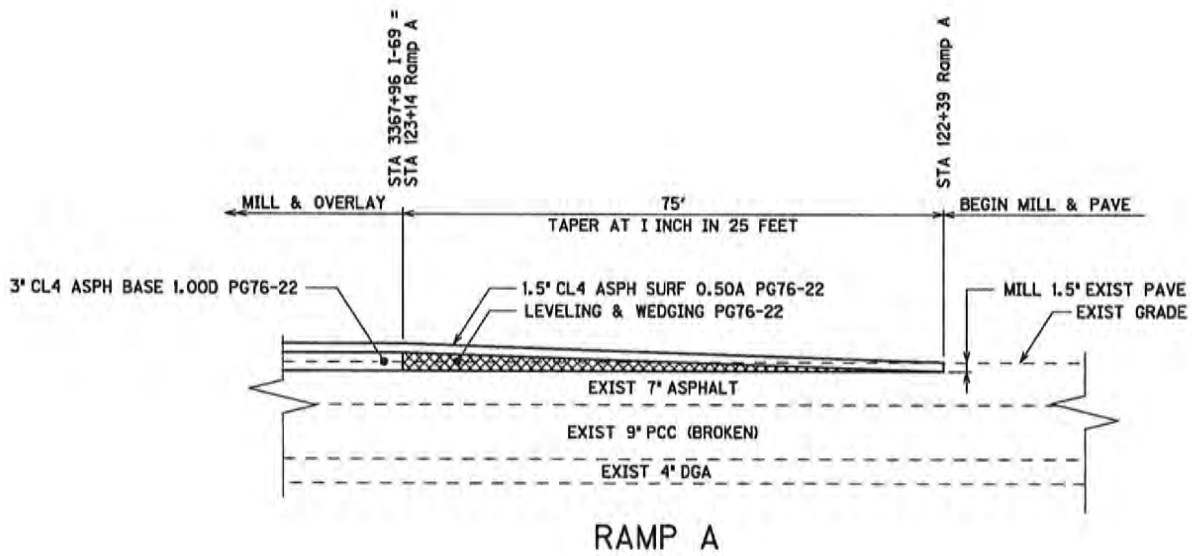
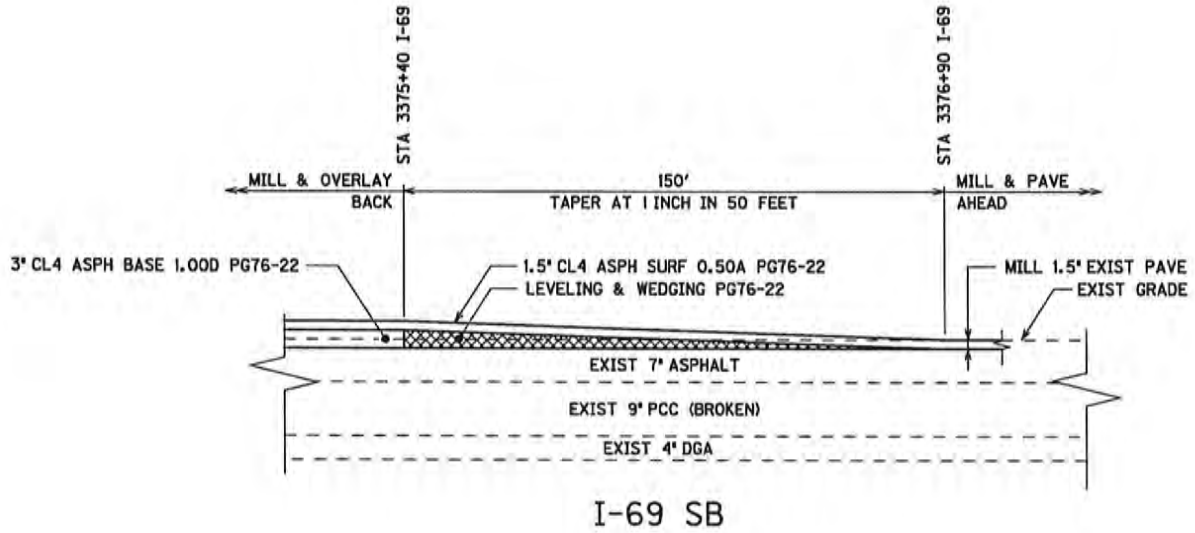


I-69 SB

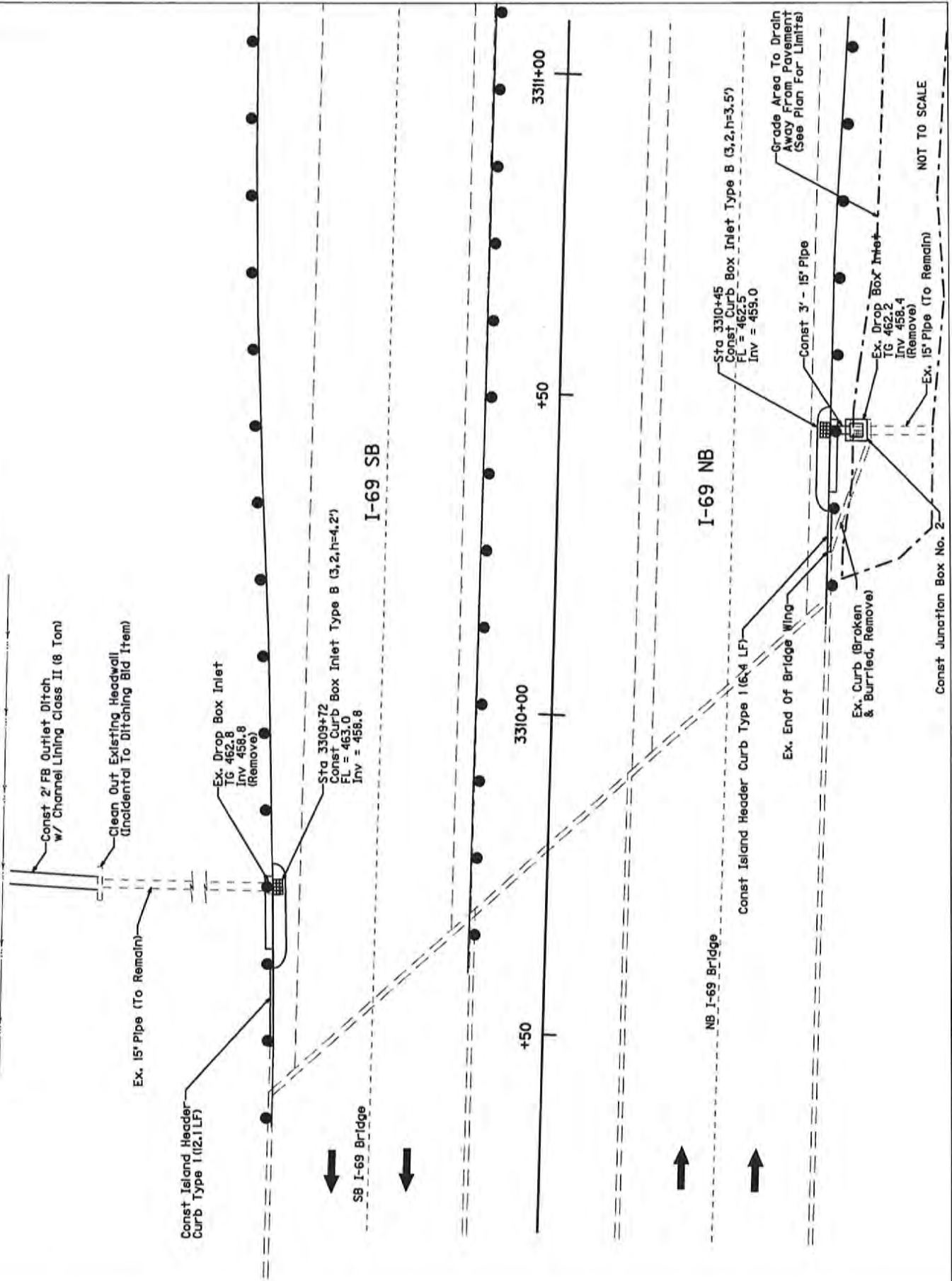


I-69 NB

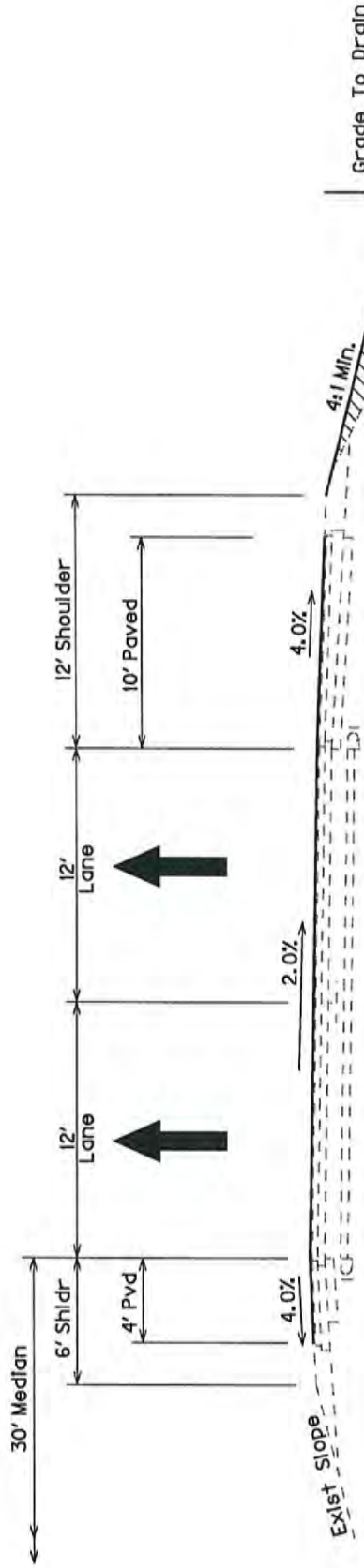
PROFILE TAPERS



BRIDGE END DRAINAGE DETAIL



CROSS SECTION DETAIL – FLATTEN EXISTING SLOPE



TYPICAL SECTION I-69 NORTHBOUND
STA 3341+50 TO STA 3345+18 (APPROX)

Use Excavated Earth From Subgrade Stabilization At Bridge Ends To Flatten Slope. Work To Be Incidental To Roadway Excavation Bid Item.

**SPECIAL NOTES APPLICABLE TO
I-69 REHABILITATION PROJECT**

**HOPKINS COUNTY
ITEM NO. 2-2067.00**

- FIXED COMPLETION DATE AND LIQUIDATED DAMAGES
- ASPHALT MILLING & TEXTURING
- MATERIAL TRANSFER VEHICLE (MTV)
- ROADBED STABILIZATION AT BRIDGE ENDS
- PORTABLE CHANGEABLE MESSAGE SIGNS
- KPDES PERMIT AND TEMPORARY EROSION CONTROL
- WASTE AND BORROW SITES
- LONGITUDINAL PAVEMENT JOINT ADHESIVE
- PROTECTION OF UTILITIES
- TYPICAL SECTION DIMENSIONS

SEE BRIDGE PROPOSAL FOR SPECIAL NOTES RELATED TO BRIDGE WORK.

**Special Note for Fixed Completion Date and
Liquidated Damages
Hopkins County
Item No. 2-2067**

Contrary to Section 108.09, Liquidated Damages of \$5,000 per calendar day will be assessed for each day work remains uncompleted beyond the Specified Completion Date. This project has a Fixed Completion Date of November 1, 2013.

Contrary to Section 108.09 of the Standard Specifications, **the disincentive fee will be charged during those periods when seasonal limitations of the Contract prohibit the Contractor from working on a controlling item or operation. This includes the months from December through March.**

All liquidated damages will be applied cumulatively.

All other applicable portions of Section 108 apply.

SPECIAL NOTE FOR
ASPHALT MILLING AND TEXTURING
HOPKINS - WEBSTER COUNTY

Begin paving operations within **48 hours** of commencement of the milling operation. Continue paving operations continuously until completed. If paving operations are not begun within this time period, liquidated damages will be assessed at the rate prescribed by Section 108.09 of the current Standard Specifications until such time as paving operations are begun. Milling & Paving operations must be completed that prevents uneven payment with adjacent lanes.

Contrary to Section 408 of the current Standard Specifications, the material obtained from the milling operations shall become the property of the Department. Deliver this material to the State Maintenance facilities listed unless otherwise stated in the contract.

5,643 Tons – Hopkins County

The Contractor, at his option, may elect to keep the remaining material at an agreed cost of \$7.50 per ton. The cost to the Contractor for this material will be deducted from money due on the Contract.

Notice to Contractor

Transfer of millings to the state maintenance facility is considered a part of the construction project, therefore truck operators are subject to receiving prevailing wages.

**SPECIAL NOTE FOR
MATERIAL TRANSFER VEHICLE (MTV)**

Provide and use a MTV in accordance with Sections 403.02.10 and 403.03.05(A).

SPECIAL NOTE FOR ROADBED STABILIZATION AT BRIDGE ENDS

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Due to the wet and yielding embankments commonly encountered at bridge ends, undercut the existing roadbed within the limits the Contract specifies and backfill.

2.0 MATERIALS.

2.1 Geotextile Fabric. Furnish Type III fabric conforming to Section 843.

3.0 CONSTRUCTION. After removing the existing pavement and base, undercut the existing roadbed under the traffic lanes and shoulders as the Engineer directs. The minimum undercut shall be one foot, except undercut depth may be reduced where rock embankment constructed principally of limestone is encountered. Place geotextile fabric in the bottom and against the sides and ends of the undercut. The Department will not require a minimum lap between adjacent sheets of geotextile fabric for the longitudinal joint under the pavement centerline. Backfill the undercut with one or more of the following materials;

- 1) Crushed limestone size No. 1, 2, 23, or 57; or
- 2) Layered composition of several limestone sizes, with larger sizes on the bottom.

Use Dense Graded Aggregate (DGA), Crushed Stone Base (CSB), or Stabilized Aggregate Base (SAB) in the top 4 inches, and only in the top 4 inches, of the backfill.

Place geotextile fabric between the coarse backfill material and the 4-inch upper layer.

Compact the backfill material by "walking down" with equipment, or other methods the Engineer approves. See attached drawing for details of backfill placement and drainage.

Waste all removed materials, not used for purposes the Contract or Engineer specifies or permits, off the right-of-way at no expense to the Department.

4.0 MEASUREMENT.

4.1 Removing Pavement. The Department will measure the quantity in square yards. The Department will consider the pavement to include existing pavement, existing asphalt patching, and existing DGA base.

4.2 Roadway Excavation. The Department will measure the quantity in cubic yards.

4.3 Backfilling Undercut. The Department will measure the quantity in cubic yards. The Department will not measure coarse aggregate for payment and will consider it incidental to this item of work.

4.4 Perforated Pipe. The Department will measure the quantity in linear feet.

4.5 Non-Perforated Pipe. The Department will measure the quantity in linear feet.

4.6 Geotextile Fabric, Type III. The Department will measure the quantity in square yards.

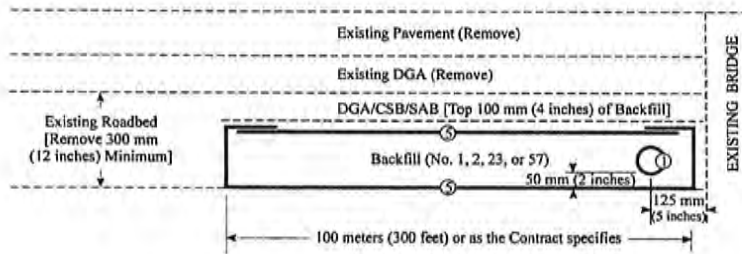
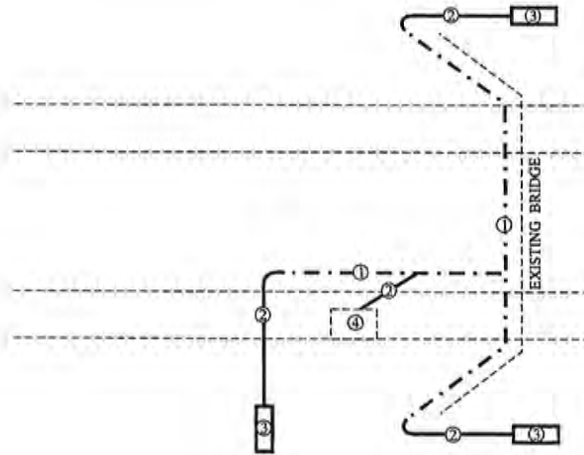
5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

| <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> |
|-------------|-------------------------------|-----------------|
| 02091 | Removing Pavement | Square Yard |
| 01000 | Perforated Pipe - 4 inches | Linear Foot |
| 01010 | Non-Perforated Pipe, 4 inches | Linear Foot |
| 02235 | Backfilling Undercut | Cubic Yard |
| 02598 | Fabric - Geotextile Type III | Square Yard |

The Department will consider payment as full compensation for all work required in this note.

June 15, 2012

BRIDGE END DRAINAGE AND STABILIZATION (DETAILS)



NOTES

Contrary to Section 705 of the Standard Specifications, use only coarse aggregate for trench backfill.

Slope all pipe to drain to the outside. Provide a 1:24 (1/2":1') or greater slope for the outlet pipe.

The Department may require additional transverse drains within the stabilization area.

LEGEND

- ① 100-mm (4-inch) Perforated Pipe
- ② 100-mm (4-inch) Non-perforated Pipe
- ③ Perforated Pipe Headwall
- ④ Existing Box Inlet
- ⑤ Geotextile Fabric, Type III

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

- 1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
- 2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
- 3) Provide a controller consisting of:
 - a) Keyboard or keypad.
 - b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
 - c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
 - d) Logic circuitry to control the sequence of messages and flash rate.
- 4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
- 5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
- 6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
- 7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
- 8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
- 9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
- 10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
- 11) Provide a photocell control to provide automatic dimming.

- 12) Allow an on-off flashing sequence at an adjustable rate.
- 13) Provide a sight to aim the message.
- 14) Provide a LED display color of approximately 590 nm amber.
- 15) Provide a controller that is password protected.
- 16) Provide a security device that prevents unauthorized individuals from accessing the controller.
- 17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

| | |
|-------------------------|-------------------------|
| /KEEP/RIGHT/⇒⇒⇒/ | /MIN/SPEED/**MPH/ |
| /KEEP/LEFT/⇐⇐⇐/ | /ICY/BRIDGE/AHEAD/ /ONE |
| /LOOSE/GRAVEL/AHEAD/ | LANE/BRIDGE/AHEAD/ |
| /RD WORK/NEXT/**MILES/ | /ROUGH/ROAD/AHEAD/ |
| /TWO WAY/TRAFFIC/AHEAD/ | /MERGING/TRAFFIC/AHEAD/ |
| /PAINT/CREW/AHEAD/ | /NEXT/***/MILES/ |
| /REDUCE/SPEED/**MPH/ | /HEAVY/TRAFFIC/AHEAD/ |
| /BRIDGE/WORK/**0 FT/ | /SPEED/LIMIT/**MPH/ |
| /MAX/SPEED/**MPH/ | /BUMP/AHEAD/ |
| /SURVEY/PARTY/AHEAD/ | /TWO/WAY/TRAFFIC/ |

*Insert numerals as directed by the Engineer.

Add other messages during the project when required by the Engineer.

2.3 Power.

- 1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

| <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> |
|-------------|----------------------------------|-----------------|
| 02671 | Portable Changeable Message Sign | Each |

Effective June 15, 2012

Special Note For:
K.P.D.E.S. Permit & Temporary Erosion Control
Item No. 2-2067.00 - Hopkins County

The Contractor shall be responsible for filing the Kentucky Pollution Discharge Elimination System (KPDES) KYR10 permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW) and any KPDES local Municipal Separate Storm Sewer System (MS4) program that has jurisdiction. The NOI shall name the contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP plan documents as construction progresses and documenting the installation and maintenance of BMPs in conformance with the KPDES KYR10 permit effective on August 1, 2009 or a permit re-issued to replace that KYR10 permit. This work shall be conducted in conformance with the requirements of Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction.

Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction. The Engineer's inspections shall be performed a minimum of once per month and within seven days after a storm of ½ inch or greater. Copies of the Engineer's inspections shall not be provided to the contractor unless improvements to the BMP's are required. The contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within 5 days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance with the KPDES permit.

Contrary to Section 213.05, bid items for temporary BMPs will not be listed and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.

The contractor shall be responsible for applying "good engineering practices" as required by the KPDES permit. The contractor may use any temporary BMPs with the approval of the KYTC Engineer.

The contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

The contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMPs that will be required to accomplish effective erosion prevention and sediment control.

The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 program that has jurisdiction. The NOT shall be filed after the Engineer agrees that the project is stabilized or the project has been formally accepted.

Payment: Payment will be by lump sum under the bid item "K.P.D.E.S. Permit & Temporary Erosion Control".

SPECIAL PROVISION FOR WASTE AND BORROW SITES

The contractor is advised that it is their responsibility to gain U.S. Army Corp of Engineer's approval before utilizing a waste or borrow site that involves "Waters of the United States". "Waters of the United States" are defined as perennial or intermittent streams, ponds or wetlands. Ephemeral streams are also considered jurisdictional waters, and are typically dry except during rainfall, but have a defined drainage channel. Questions concerning any potential impacts to "Waters..." should be brought to the attention of the appropriate District Office for the Corps of Engineers for a determination, prior to disturbance. Any fees associated with obtaining approval from the U.S. Army Corp of Engineer or other appropriate regulatory agencies for waste and borrow sites is the responsibility of the contractor.

01/01/2009

SPECIAL NOTE FOR LONGITUDINAL PAVEMENT JOINT ADHESIVE

1. DESCRIPTION. This specification covers the requirements and practices for applying an asphalt adhesive material to the longitudinal joint of the surface course of an asphalt pavement. Apply the adhesive to the face of longitudinal joint between driving lanes for the first lane paved. Then, place and compact the adjacent lane against the treated face to produce a strong, durable, waterproof longitudinal joint.
2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Joint Adhesive. Provide material conforming to Subsection 2.1.1 or 2.1.2.

2.1.1 Provide an adhesive conforming to the following requirements:

| Property | Specification | Test Procedure |
|------------------------------|---------------|----------------|
| Viscosity, 400 ° F (Pa·s) | 4.0 – 10.0 | ASTM D 3236 |
| Cone Penetration, 77 ° F | 60 – 100 | ASTM D 5329 |
| Flow, 140 ° F (mm) | 5.0 max. | ASTM D 5329 |
| Resilience, 77 ° F (%) | 30 min. | ASTM D 5329 |
| Ductility, 77 ° F (cm) | 30.0 min. | ASTM D 113 |
| Ductility, 39 ° F (cm) | 30.0 min. | ASTM D 113 |
| Tensile Adhesion, 77 ° F (%) | 500 min. | ASTM D 5329 |
| Softening Point, ° F | 171 min. | AASHTO T 53 |
| Asphalt Compatibility | Pass | ASTM D 5329 |

Ensure the temperature of the pavement joint adhesive is between 380 and 410 °F when the material is extruded in a 0.125-inch-thick band over the entire face of the longitudinal joint.

2.1.2 Provide an adhesive conforming to the following requirements:

| Property | Specification | Test Procedure |
|--|---------------|----------------|
| Softening Point ¹ , θF | 176 min. | AASHTO T 53 |
| Cone Penetration ² , 77 θF | 20-60 | ASTM D 5329 |
| Flow ¹ , 140 θF (mm) | 5.0 max. | ASTM D 5329 |
| Tensile Adhesion, 77 θF (%) | 500 min. | ASTM D 5329 |
| Asphalt Compatibility | Pass | ASTM D 5329 |
| Resilience ² , 77 θF (%) | 30 min. | ASTM D 5329 |
| Slump Test ¹ , 300 ° F (mm) | 2.0 max. | ASTM D 2202 |

¹Cold sample forced into molds at 325 ° F.

²Field sample extruded into mold at application temperature.

Ensure the temperature of the pavement joint adhesive is between 300 and 350 °F when the material is extruded in a 0.20 to 0.40-inch-thick band over the entire face of the longitudinal joint.

2.2. Equipment.

2.2.1 Melter Kettle. Provide an oil-jacketed, double-boiler, melter kettle equipped with any needed agitation and recirculating systems.

2.2.2 Applicator System. Provide a pressure-feed-wand applicator system with an applicator shoe attached.

2.3 Personnel. Ensure a technical representative from the manufacturer of the pavement joint adhesive is present during the initial construction activities and available upon the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the pavement joint adhesive, ensure the face of the longitudinal joint is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the joint face by the use of compressed air. Ensure this preparation process occurs shortly before application to prevent the return of debris on the joint face.

3.2 Pavement Joint Adhesive Application. Ensure the ambient temperature is a minimum of 40 ° F during the application of the pavement joint adhesive. Prior to applying the adhesive, demonstrate competence in applying the adhesive according to this note to the satisfaction of the Engineer. Heat the adhesive in the melter kettle to the specified temperature range. Pump the adhesive from the melter kettle through the wand onto the vertical face of the cold joint. Apply the adhesive in a continuous band over the entire face of the longitudinal joint. Do not use excessive material in either thickness or location. Ensure the edge of the extruded adhesive material is flush with the surface of the pavement. Then, place and compact the adjacent lane against the joint face. Remove any excessive material extruded from the joint after compaction (a small line of material may remain).

3.3 Pavement Joint Adhesive Certification. Furnish the joint adhesive's certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a random sample of pavement joint adhesive from each manufacturer's lot of material. Extrude two 5 lb. samples of the heated material and forward the sample to the Division of Materials for testing. Reynolds oven bags, turkey size, placed inside small cardboard boxes or cement cylinder molds have been found suitable. Ensure the product temperature is 400°F or below at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of Pavement Joint Adhesive in linear feet. The Department will not measure for payment any extra

materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of Pavement Joint Adhesive, the cleaning of the joint face, or furnishing and placing the adhesive. The Department will consider all such items incidental to the Pavement Joint Adhesive.

5. PAYMENT. The Department will pay for the Pavement Joint Adhesive at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

| Pavement Joint Adhesive Price Adjustment Schedule | | | | | | |
|---|---------------|----------|-----------|-----------|-----------|--------|
| Test | Specification | 100% Pay | 90% Pay | 80% Pay | 50% Pay | 0% Pay |
| Joint Adhesive Referenced in Subsection 2.1.1 | | | | | | |
| Viscosity, 400 ° F (Pa*s) | | | 3.0-3.4 | 2.5-2.9 | 2.0-2.4 | δ 1.9 |
| ASTM D 3236 | 4.0-10.0 | 3.5-10.5 | 10.6-11.0 | 11.1-11.5 | 11.6-12.0 | τ 12.1 |
| Cone Penetration, 77 ° F | | | 54-56 | 51-53 | 48-50 | δ 47 |
| ASTM D 5329 | 60-100 | 57-103 | 104-106 | 107-109 | 110-112 | τ 113 |
| Flow, 140 ° F (mm) ASTM D 5329 | δ 5.0 | δ 5.5 | 5.6-6.0 | 6.1-6.5 | 6.6-7.0 | τ 7.1 |
| Resilience, 77 ° F (%) ASTM D 5329 | τ 30 | τ 28 | 26-27 | 24-25 | 22-23 | δ 21 |
| Tensile Adhesion, 77 ° F (%) ASTM D 5329 | τ 500 | τ 490 | 480-489 | 470-479 | 460-469 | δ 459 |
| Softening Point, ° F AASHTO T 53 | τ 171 | τ 169 | 166-168 | 163-165 | 160-162 | δ 159 |
| Ductility, 77 ° F (cm) ASTM D 113 | τ 30.0 | τ 29.0 | 28.0-28.9 | 27.0-27.9 | 26.0-26.9 | δ 25.9 |
| Ductility, 39 ° F (cm) ASTM D 113 | τ 30.0 | τ 29.0 | 28.0-28.9 | 27.0-27.9 | 26.0-26.9 | δ 25.9 |
| Joint Adhesive Referenced in Subsection 2.1.2 | | | | | | |
| Flow, 140 ° F (mm) ASTM D 5329 | δ 5 | 5.1-5.2 | 5.3-5.4 | 5.5-5.6 | 5.7-5.8 | τ 5.9 |
| Resilience, 77 ° F (%) ASTM D 5329 | τ 30 | 29 | 28-27 | 26-25 | 24-23 | δ 22 |
| Softening Point, ° F AASHTO T 53 | τ 176 | τ 174 | 171-173 | 168-170 | 165-167 | δ 164 |
| Cone Penetration, 77 ° F ASTM D 5329 | | | 16-17 | 14-15 | 12-13 | δ 11 |
| | 20-60 | 18-62 | 63-64 | 65-66 | 67-68 | τ 69 |
| Tensile Adhesion, 77 ° F (%) ASTM D 5329 | τ 500 | τ 490 | 480-489 | 470-479 | 460-469 | δ 459 |
| Slump Test, 300 ° F (mm) ASTM D 2202 | δ 2.0 | δ 2.5 | 2.6-3.0 | 3.1-3.5 | 3.6-4.0 | τ 4.1 |
| Asphalt Compatibility, ASTM D 5329 | Pass | | | | | |

Code
20071EC

Pay Item
Joint Adhesive

Pay Unit
Linear Foot

June 8, 2004

HOPKINS COUNTY
I-69 Pavement Rehabilitation Project
Item No. 2-2067.00

SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities. If conflicts do arise, it is the responsibility of the contractor to verify the location of the existing utilities and to arrive at appropriate resolutions with the Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The Kentucky Transportation Cabinet makes no guarantees regarding: the existence of utilities, the location of utilities, the utility companies in the project scope, or the potential for conflicts encountered during construction. The location of utilities provided herein has been furnished by the facility owners and/or by reviewing record drawings and may not be accurate. It will be the roadway contractor's responsibility to locate utilities before excavating by calling the various utility owners and by examining any supplemental information supplied by the Cabinet. If necessary, the roadway contractor shall determine the exact location and elevation of utilities by hand digging to expose utilities before excavating in the area of a utility. The cost for repair and any other associated costs for any damage to utilities caused by the roadway contractor's operations shall be borne by the roadway contractor.

Overhead utility wire crossings are shown on the plan sheets included in the proposal. The Contractor is responsible for verifying vertical clearances and for alerting all his employees and subcontractors of these overhead wire crossings and for taking whatever measures are needed to insure these wires are not damaged.

BEFORE YOU DIG

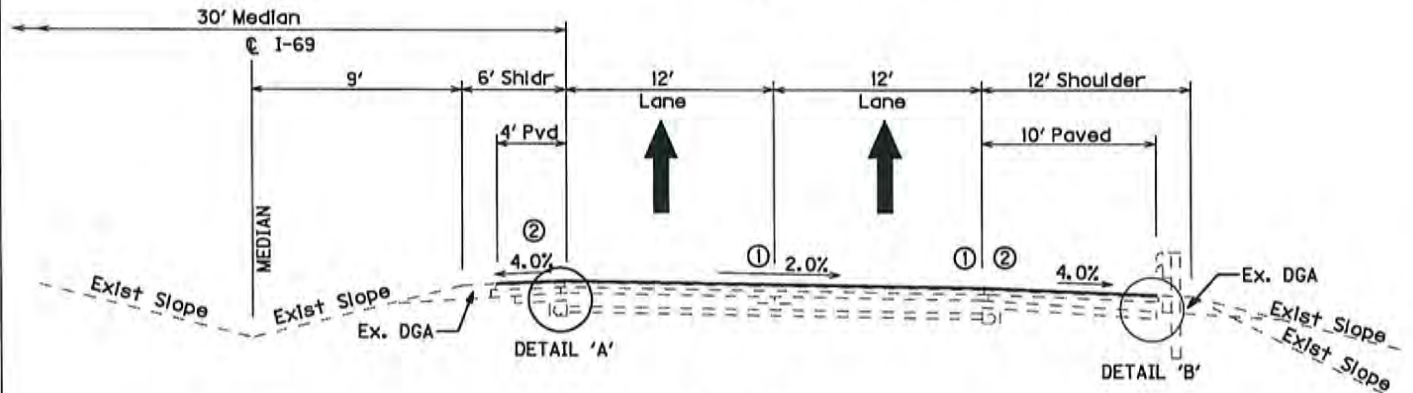
The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

SPECIAL NOTE FOR TYPICAL SECTION DIMENSIONS

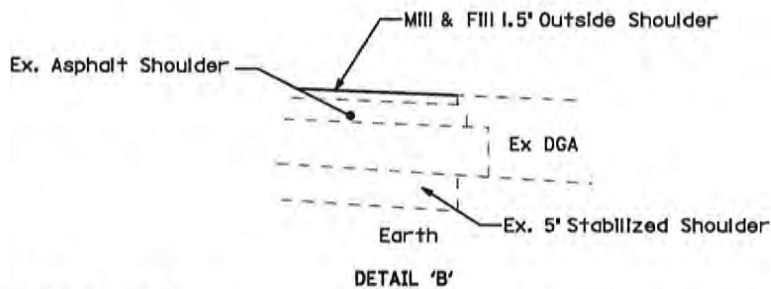
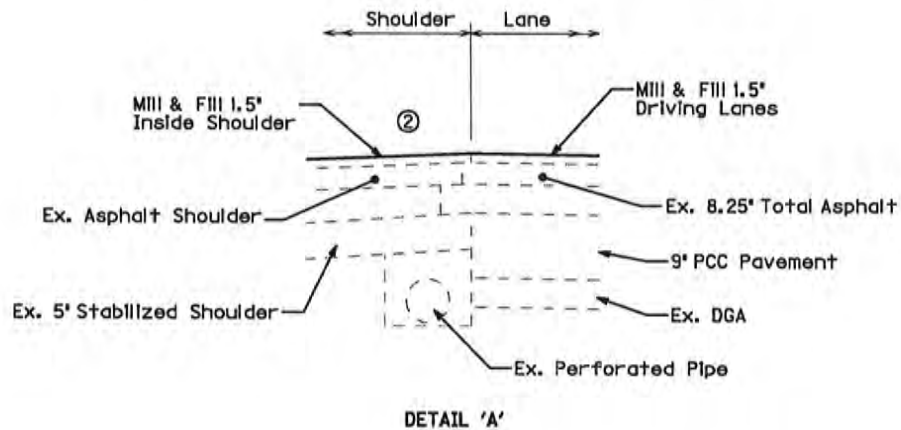
The dimensions shown on the typical sections for pavement and shoulder widths are nominal or typical dimensions. The actual dimensions to be constructed or milled & textured may be varied to fit existing conditions as directed or approved by the Engineer. It is not intended that existing pavement or shoulders be widened unless specified elsewhere in the Proposal.

TYPICAL SECTIONS

I-69



NORMAL SECTION NORTHBOUND



PAVEMENT REHABILITATION

DRIVING LANES & SHOULDERS

- ① Place Joint Adhesive Between Driving Lanes And Between Driving Lane And Shoulders. Match Existing Cross Slope.
- ② Construct Sawed Rumble Strips

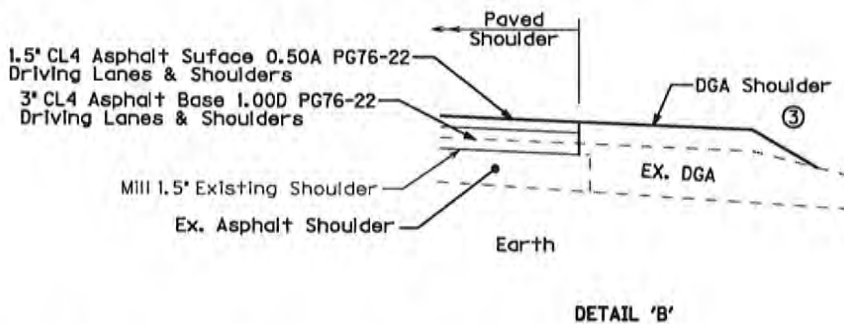
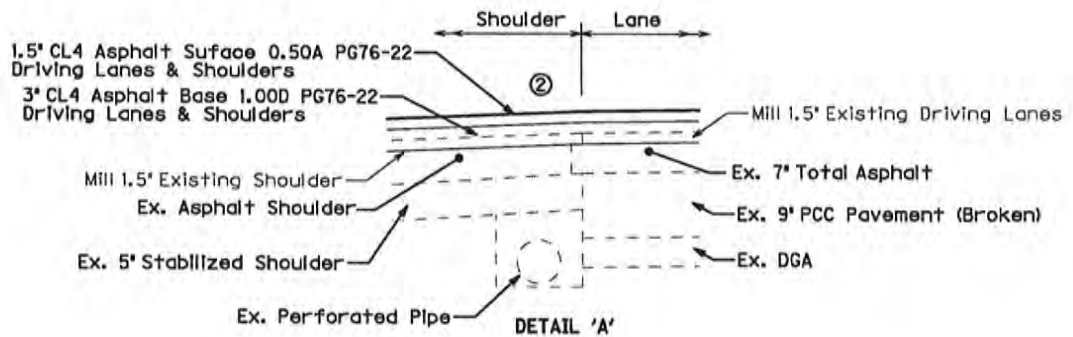
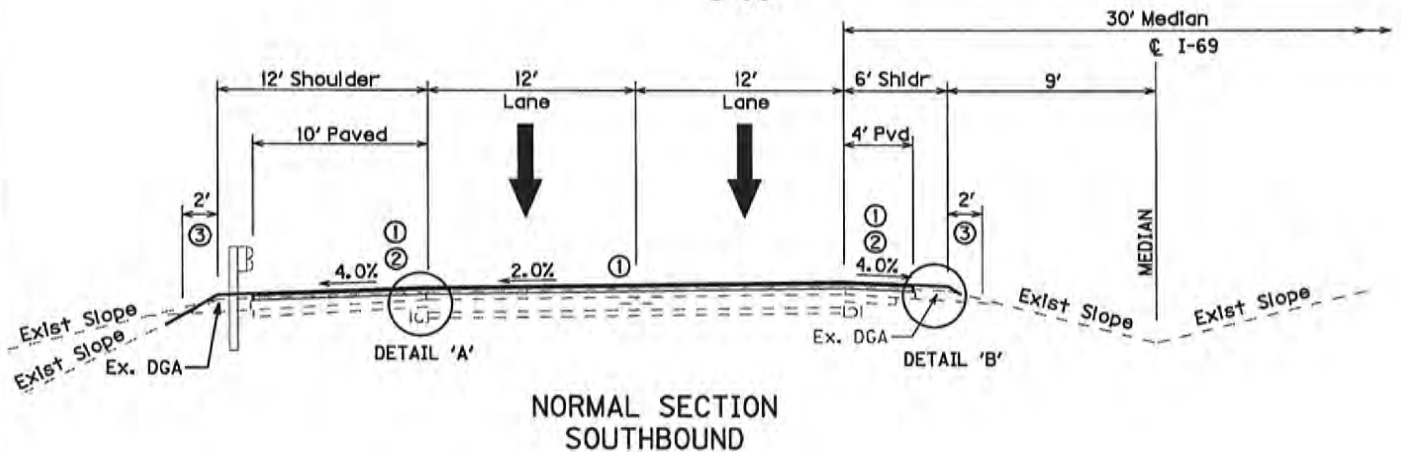
SURFACE --- 1.5" CL4 ASPHALT SURFACE 0.50A PG76-22
 --- 1.5" ASPHALT MILLING & TEXTURING

NOTE: EXISTING PAVEMENT INFORMATION SHOWN TAKEN FROM PREVIOUS PLANS

NOT TO SCALE

TYPICAL SECTIONS

I-69



PAVEMENT REHABILITATION

DRIVING LANES & SHOULDERS

SURFACE --- 1.5" CL4 ASPHALT SURFACE 0.50A PG76-22
 BASE ----- 3" CL4 ASPHALT BASE 1.00D PG76-22
 1.5" ASPHALT MILLING & TEXTURING

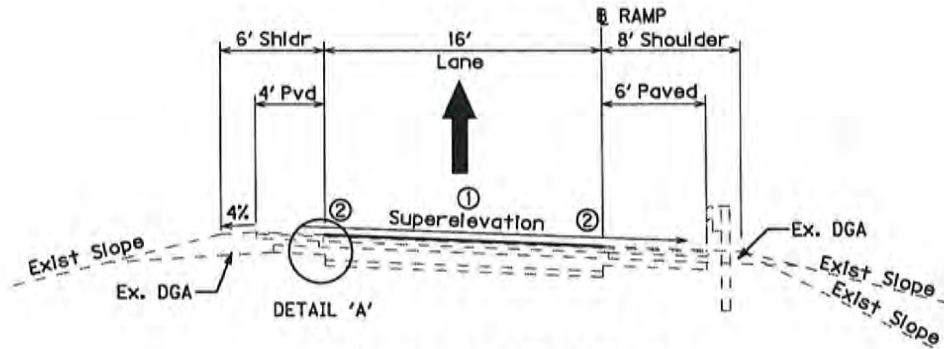
- ① Place Joint Adhesive Between Driving Lanes And Between Driving Lane And Shoulders. Match Existing Cross Slope.
- ② Construct Sawed Rumble Strips
- ③ Asphalt Seal For Shoulders From Outside Edge Of Pavement To A Point 2' Down The Ditch Or Fill Slope To Consist of 2 Applications Of:
 2.40 Lbs/Sq Yd Emulsified Asphalt RS-2
 20 Lbs/Sq Yd Asphalt Seal Aggregate (Size No 8 or 9M)

NOTE: EXISTING PAVEMENT INFORMATION SHOWN TAKEN FROM PREVIOUS PLANS

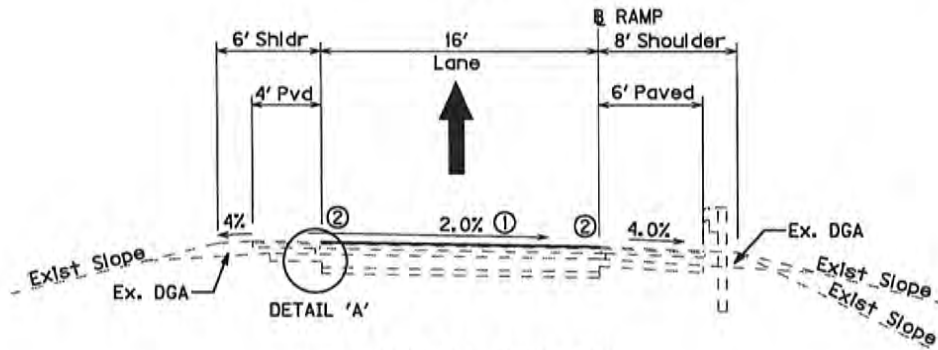
NOT TO SCALE

TYPICAL SECTIONS

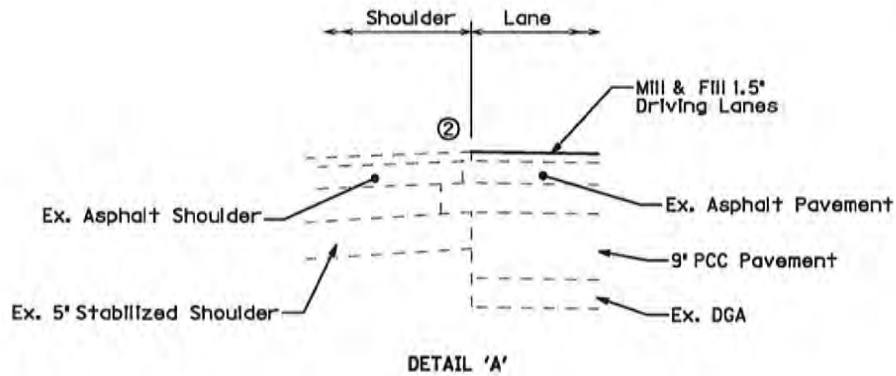
I-69 RAMPS



SUPERELEVATED SECTION



NORMAL SECTION



- ① Match Existing Cross Slope
- ② Place Joint Adhesive Between Driving Lane And Shoulders.

PAVEMENT REHABILITATION

DRIVING LANE

SURFACE --- 1.5' CL4 ASPHALT SURFACE 0.50A PG76-22
 --- 1.5' ASPHALT MILLING & TEXTURING

NOTE: EXISTING PAVEMENT INFORMATION SHOWN TAKEN FROM PREVIOUS PLANS
 NOT TO SCALE

**I-69 PAVEMENT REHABILITATION
HOPKINS COUNTY ITEM NO 2-2067.00**

GENERAL SUMMARY

| CODE | ITEM | UNIT | QUANTITY | NOTES |
|-------------|--|-------------|-----------------|--------------|
| 1890 | ISLAND HEADER CURB TYPE 1 | LF | 18.5 | |
| 1897 | ASPHALT WEDGE CURB | LF | 100 | 1 |
| 1982 | DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE | EACH | 77 | 2 |
| 1983 | DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW | EACH | 13 | 2 |
| 2014 | BARRICADE-TYPE III | EACH | 10 | |
| 2235 | BACKFILLING UNDERCUT | CU YD | 831 | |
| 2237 | DITCHING | LF | 7,095 | 3 |
| 2562 | TEMPORARY SIGNS | SQ FT | 1,000 | |
| 2568 | MOBILIZATION | LS | 1 | |
| 2569 | DEMOBILIZATION | LS | 1 | |
| 2650 | MAINTAIN & CONTROL TRAFFIC | LS | 1 | |
| 2671 | PORTABLE CHANGEABLE MESSAGE SIGN | EACH | 4 | |
| 2775 | ARROW PANEL | EACH | 4 | |
| 5950 | EROSION CONTROL BLANKET | SQ YD | 5,000 | |
| 5985 | SEEDING AND PROTECTION | SQ YD | 5,000 | |
| 6417 | FLEXIBLE DELINEATOR POST-W | EACH | 5 | 4 |
| 6418 | FLEXIBLE DELINEATOR POST-Y | EACH | 5 | 4 |
| 6549 | PAVE STRIPING-TEMP REM TAPE-B | LF | 5,000 | |
| 6550 | PAVE STRIPING-TEMP REM TAPE-W | LF | 5,000 | |
| 6551 | PAVE STRIPING-TEMP REM TAPE-Y | LF | 5,000 | |
| 6592 | PAVEMENT MARKER TYPE V-B W/R | EACH | 238 | 5 |
| 6593 | PAVEMENT MARKER TYPE V-B Y/R | EACH | 113 | 5 |
| 10020NS | FUEL ADJUSTMENT | DOLL | 11,285 | |
| 10030NS | ASPHALT ADJUSTMENT | DOLL | 22,799 | |
| 23143ED | KPDES PERMIT AND TEMP EROSION CONTROL | LS | 1 | 6 |
| 24189ER | DURABLE WATERBORNE MARKING - 6 IN W | LF | 22,256 | |
| 24190ER | DURABLE WATERBORNE MARKING - 6 IN Y | LF | 18,708 | |
| 24191ER | DURABLE WATERBORNE MARKING - 12 IN W | LF | 1,200 | |

- 1) Includes 30 LF from the Drainage Summary.
- 2) For all guardrail on mainline I-69.
- 3) Reference is made to the Standard Specifications, Section 209.03.01 B, 2012 edition.
Cleaning all existing perforated pipe headwalls is incidental to this item.
- 4) To replace the existing delineators at the east end of the I-69 bridge over US 41.
- 5) Removal of existing pavement markers shall be incidental to this item.
- 6) See special note for details.

I-69 PAVEMENT REHABILITATION
HOPKINS COUNTY ITEM NO 2-2067.00

| PAVEMENT QUANTITIES | | | | | | | | | | |
|---------------------|----------------------------------|----------|----------------------|----------------------|---------------------|--------|--------|--------|---------------|--|
| ITEM CODE | ITEM | UNIT | I-69 SB (ML & SHLDR) | I-69 NB (ML & SHLDR) | RAMP A (VERT TAPER) | RAMP B | RAMP C | RAMP D | PROJECT TOTAL | |
| 1 | DGA BASE | 1 TON | 1,346 | 450 | | | | | 1,796 | |
| 100 | ASPHALT SEAL AGGREGATE | 2 TON | 120 | | | | | | 120 | |
| 103 | ASPHALT SEAL COAT | 3 TON | 14.4 | | | | | | 14.4 | |
| 194 | LEVELING & WEDGING PG76-22 | 4, 7 TON | 152 | 100 | 18 | | | | 270 | |
| 217 | CL4 ASPH BASE 1.00D PG64-22 | 4 TON | 887 | 894 | | | | | 1,781 | |
| 219 | CL4 ASPH BASE 1.00D PG76-22 | 4 TON | 4,767 | | | | | | 4,767 | |
| 335 | CL4 ASPH SURF 0.50A PG76-22 | 4 TON | 2,605 | 2,562 | 18 | 186 | 296 | 181 | 5,848 | |
| 1897 | ASPHALT WEDGE CURB | LF | | | | 70 | | | 70 | |
| 2091 | REMOVE PAVEMENT | SQ YD | 1,290 | 1,204 | | | | | 2,494 | |
| 2200 | ROADWAY EXCAVATION | CU YD | 484 | 401 | | | | | 885 | |
| 2235 | BACKFILLING UNDERCUT | CU YD | 430 | 401 | | | | | 831 | |
| 2598 | FABRIC - GEOTEXTILE TYPE III | SQ YD | 2,838 | 2,649 | | | | | 5,487 | |
| 2676 | MOBILIZATION FOR MILL & TEXT | LS | | | | | | | 1 | |
| 2677 | ASPHALT PAVE MILLING & TEXTURING | 4 TON | 2,499 | 2,463 | 18 | 186 | 296 | 181 | 5,643 | |
| 2696 | SHOULDER RUMBLE STRIPS - SAWED | LF | 14,190 | 14,190 | 150 | | | | 28,530 | |
| 3240 | BASE FAILURE REPAIR | SQ YD | 150 | | | | | | 150 | |
| 20071EC | JOINT ADHESIVE | 5 LF | 21,285 | 21,285 | 150 | 2,462 | 4,020 | 2,404 | 51,606 | |
| 20509ED | BLOW UP/RELIEF JOINT | 6 SQ YD | 123 | 123 | | | | | 246 | |

- 1) Estimated at 115 pounds per square yard per inch depth and/or at 2.07 tons per cubic yard.
- 2) Estimated at 20 pounds per square yard per application with two applications required.
- 3) Estimated at 2.4 pounds per square yard per application with two applications required.
- 4) Estimated at 110 pounds per square yard per inch depth.
- 5) See Special Note for details.
- 6) Estimated at 1 each per 1000 linear feet.
- 7) Includes an additional 100 tons per each direction for slope correction and to be used as directed by the Engineer.

I-69 PAVEMENT REHABILITATION
HOPKINS COUNTY ITEM NO 2-2067.00

| ITEM | PAVEMENT AREAS | | | | | | TOTAL |
|---------------------------------------|------------------------|------------------------|------------------------|--------|--------|--------|--------|
| | I-69 SB (ML & SHDR) | I-69 NB (ML & SHDR) | RAMP A (VERT TAPER) | RAMP B | RAMP C | RAMP D | |
| SQUARE YARDS | | | | | | | |
| 3" DGA BASE | 3,000 | | | | | | 3,000 |
| 6" DGA BASE | 1,290 | | | | | | 1,290 |
| 6.5" DGA BASE | | 1,204 | | | | | 1,204 |
| DGA BASE FOR SHOULDER WEDGE SB | 1 | 185 | | | | | 185 |
| ASPHALT SEAL AGGREGATE | 6,001 | | | | | | 6,001 |
| ASPHALT SEAL COAT | 6,001 | | | | | | 6,001 |
| 1.5" LEVELING & WEDGING PG76-22 | 633 | | 218 | | | | 851 |
| 4" CL4 ASPH BASE 1.00D PG64-22 | 1,290 | | | | | | 1,290 |
| 4" CL4 ASPH BASE 1.00D PG64-22 | 1,290 | | | | | | 1,290 |
| 4.5" CL4 ASPH BASE 1.00D PG64-22 | 1,290 | 1,204 | | | | | 2,494 |
| 4.5" CL4 ASPH BASE 1.00D PG64-22 | | 1,204 | | | | | 1,204 |
| 4.5" CL4 ASPH BASE 1.00D PG64-22 | | 1,204 | | | | | 1,204 |
| 3" CL4 ASPH BASE 1.00D PG76-22 | 28,890 | | | | | | 28,890 |
| 1.5" CL4 ASPH SURF 0.50A PG76-22 | 31,577 | 31,056 | 218 | 2,249 | 3,590 | 2,198 | 70,888 |
| REMOVE PAVEMENT | 1,290 | 1,204 | | | | | 2,494 |
| 12" ROADWAY EXCAVATION | | 1,204 | | | | | 1,204 |
| 13.5" ROADWAY EXCAVATION | 1,290 | | | | | | 1,290 |
| 12" BACKFILLING UNDERCUT | 1,290 | 1,204 | | | | | 2,494 |
| FABRIC - GEOTEXTILE TYPE III | 2,838 | 2,649 | | | | | 5,487 |
| 1.5" ASPHALT PAVE MILLING & TEXTURING | 30,287 | 29,853 | 218 | 2,249 | 3,590 | 2,198 | 68,395 |
| BASE FAILURE REPAIR | 150 | | | | | | 150 |
| BLOW UP/RELIEF JOINT | 2 | 17.33 | | | | | 34.66 |

1) This item reported in cubic yards.

2) This item reported in square yards per each.

I-69 PAVEMENT REHABILITATION
HOPKINS COUNTY ITEM NO 2-2067.00

| DRAINAGE SUMMARY | | | | | | | | | | | | | | | | NOTES | |
|----------------------|-----|-------------------------------------|--------------------|-------------------------|----------------------------|---|---|--------------------------------|-------------------------------|--------------------------|--------------------|--------------------|--------------|---------------------------|------|-------|----------------------------|
| ITEM CODE | TON | CRUSHED AGGREGATE SIZE NO. 2 (2) | CULVERT PIPE-15 IN | PERFORATED PIPE-4 IN | NON-PERFORATED PIPE-4IN | PERFORATED PIPE (1) HEADWALL TY 1-4 IN | PERFORATED PIPE (1) HEADWALL TY 3-4 IN | PIPE CULVERT HEADWALL-60 IN | S&F BOX INLET OUTLET-36 IN | CURB BOX INLET TYPE B | JUNCTION BOX-15 IN | FLUME INLET TYPE 2 | REMOVE INLET | ASPHALT WEDGE CURB (3) | TON | | CLASS II CHANNEL LINING |
| | TON | | LIN FT | LIN FT | | | | | EACH | | | | | LIN FT | | | |
| | 78 | | 461 | 1000 | 1010 | 1020 | 1028 | 1220 | 1453 | 1480 | 1641 | 1691 | 1718 | 1897 | 2483 | 2484 | |
| STATION | | | | | | | | | | | | | | | | | |
| 3309+72 LT | | | | | | | | | | 1 | | | 1 | | 8 | | |
| 3310+45 RT | | 3 | 3 | | | | | | | 1 | 1 | | 1 | | | | |
| 3323+40 - 3325+33 LT | | | | | | | | | | | | | | | 100 | | 10 |
| 3323+92 RT | | | | | | | | | 1 | | | | | | | | |
| 3324+83 LT | | | | | | | | | | | | | | | 17 | | 15 |
| 3330+60 | | | | | | | | 1 | | | | | | | | | |
| 3340+89 - 3344+52 LT | | | | | | | | | | | | | | | 211 | | |
| 3378+94 - 3379+63 LT | | | | | | | | | | | | | | | | | |
| 207+83 RT RAMP B | | | | | | | | | | | | 1 | | 15 | 10 | | |
| 405+60 RT RAMP D | | | | | | | | | | | | 1 | | 15 | 10 | | |
| NB BRIDGE OVER US 41 | 1 | | | 344 | 20 | | 1 | | | | | | | | | | |
| SB BRIDGE OVER US 41 | 1 | | | 344 | 20 | | 1 | | | | | | | | | | |
| RELIEF JOINTS | 14 | | | | | 7 | 7 | | | | | | | | | | |
| BLOW-UP REPAIRS | 2 | | | | | 2 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| TOTAL | 18 | 3 | 688 | 40 | 9 | 9 | 9 | 1 | 1 | 2 | 1 | 2 | 2 | 30 | 356 | 25 | |

(1) Contractor to verify type in field prior to installation

(2) To be placed around perforated pipe headwalls, refer to Std Dwg RDP-010-08

(3) Removal of existing curb will be incidental to the installation of the new curb. This quantity is carried forward to the General Summary.

I-69 PAVEMENT REHABILITATION
HOPKINS COUNTY ITEM NO 2-2067.00

| GUARDRAIL SUMMARY | | | | | | | | | | | | | |
|-------------------|----------|----------------|-------------|-------------|----------------------|-----------------------------------|---|----------|-----------------------|------------------------------------|-------------------------------|----------|------------|
| LOCATION | | ITEM | | | | | | | | | | | |
| | | 2381 REMOVE | 21802EN (3) | | 2352 STEEL W BEAM | 2360 TERMINAL SECTION NO. 1 | 2363 CONNECTOR TO BRIDGE END TYPE | | 2387 A-1 (EACH) | 2365 CRASH CUSHION TYPE IX-A | 2367 END TREATMENT TYPE | | 2369 2A |
| | | | S FACE | D FACE | | | A | A-1 | | | 1 | 2A | |
| ROADWAY | STATIONS | OFFSET | (LF) | | | | | | | | | | |
| I69 SB | 3309+34 | 3316+25 | outside | 690 | 637.5 | | 1 | | | | | | |
| I69 SB | 3324+46 | 3326+48 | outside | 202 | 150.0 | | | | | | | | |
| I69 SB | 3330+37 | 3336+02 | outside | 565 | 512.5 | | | | | | | | |
| I69 SB | 3370+45 | 3376+61 | outside | 616 | 612.5 | | | | | | | | |
| I69 SB | 3309+59 | 3312+06 | median | 247 | 100.0 | 137.5 | 1 | | 1 | | | | 2 |
| I69 NB | 3310+15 | 3313+19 | outside | 303 | 300.0 | | | 1 | | | | | |
| TOTAL | | | | 2623 | 2312.5 | 137.5 | 2 | 1 | 1 | 1 | 3 | 4 | |

- 1.) Salvage existing guardrail per the Standard Specifications, current edition, Section 719.03.07. The "Guardrail Delivery Verification Sheet" must be completed at the job site and provided to the Central Sign Shop and Recycle Center (formerly the Bally Bridge Yard) representative when the delivery is made.
- 2.) Connect to existing guardrail.
- 3.) Contrary to the standard drawing, guardrail posts shall be 7 feet in length.

Guardrail Delivery Verification Sheet

Item No: _____

| <u>GUARDRAIL, END TREATMENT, TERMINAL SECTION, OR POST TYPE</u> | <u>UNIT</u> | <u>FIELD VERIFIED AMOUNT</u> | <u>DELIVERED AMOUNT</u> |
|---|-------------|----------------------------------|-----------------------------|
| GUARDRAIL-STEEL W BEAM | LF | _____ | _____ |
| TEMPORARY GUARDRAIL | LF | _____ | _____ |
| GUARDRAIL TERMINAL SECTION | EACH | _____ | _____ |
| CRASH CUSHION TYPE IX-A | EACH | _____ | _____ |
| GUARDRAIL END TREATMENT TYPE 1 | EACH | _____ | _____ |
| GUARDRAIL END TREATMENT TYPE 2A | EACH | _____ | _____ |
| GUARDRAIL END TREATMENT TYPE 3 | EACH | _____ | _____ |
| GUARDRAIL END TREATMENT TYPE 4A | EACH | _____ | _____ |
| GUARDRAIL END TREATMENT TYPE 7 | EACH | _____ | _____ |
| GUARDRAIL CONNECTOR TO BRIDGE END | EACH | _____ | _____ |
| GUARDRAIL CONNECTOR TO CONC MED BARR | EACH | _____ | _____ |
| GUARDRAIL CONNECT-SHLD BRIDGE PIER | EACH | _____ | _____ |
| STEEL GUARDRAIL POST | EACH | _____ | _____ |

Removed guardrail, end treatments, terminal sections, and posts shall be delivered to the Bailey Bridge Yard in Frankfort, KY and shall be neatly stacked in accordance with section 719.03.07 of the standard specifications. Contractor, engineer, and Bailey Bridge Yard representative must all sign off on this sheet before payment may be made.

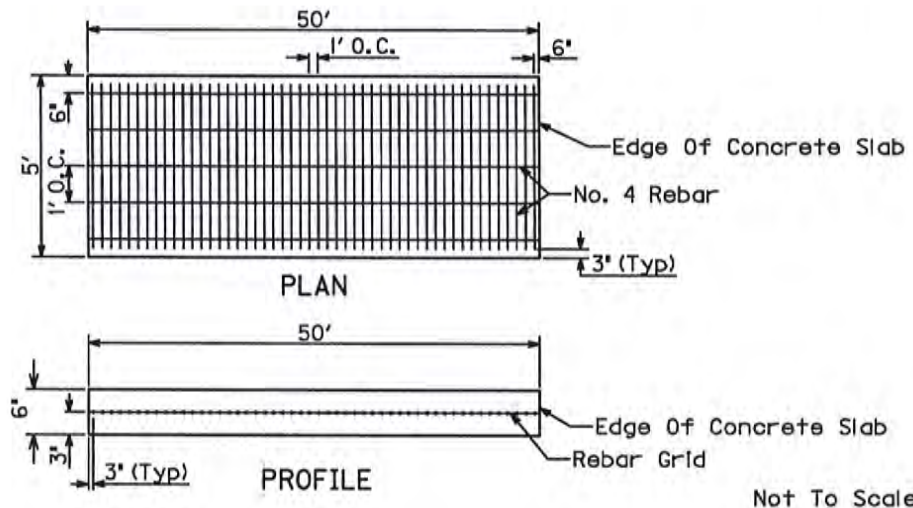
| | PRINTED NAME | SIGNATURE | DATE |
|---------------------------------------|--------------|-----------|-------|
| Resident Engineer (or representative) | _____ | _____ | _____ |
| Contractor (or Representative) | _____ | _____ | _____ |
| Bailey Bridge Yard Representative | _____ | _____ | _____ |

SLOPE PROTECTION REPAIR FOR TWIN BRIDGES OVER PENNYRILE PARKWAY

This work is to repair the 5' wide earth berm and fill the voids beneath the 4" concrete slabs serving as slope protection for the fill slopes in front of the end bents of the twin bridges over the Pennyrile Parkway.

Flowable fill is to be used to fill the voids under the existing concrete slope protection and fill the eroded areas of the berm to the bottom of the level of the cap where the cap is to be installed. The quantity of flowable fill will vary with each end bent.

A class A concrete cap is to be constructed between the face of the end bent and the top edge of the concrete slope protection. The cap is to be 6" thick and have one mat of No. 4 rebar in the vertical center of the cap on 12" x 12" Centers as shown below:

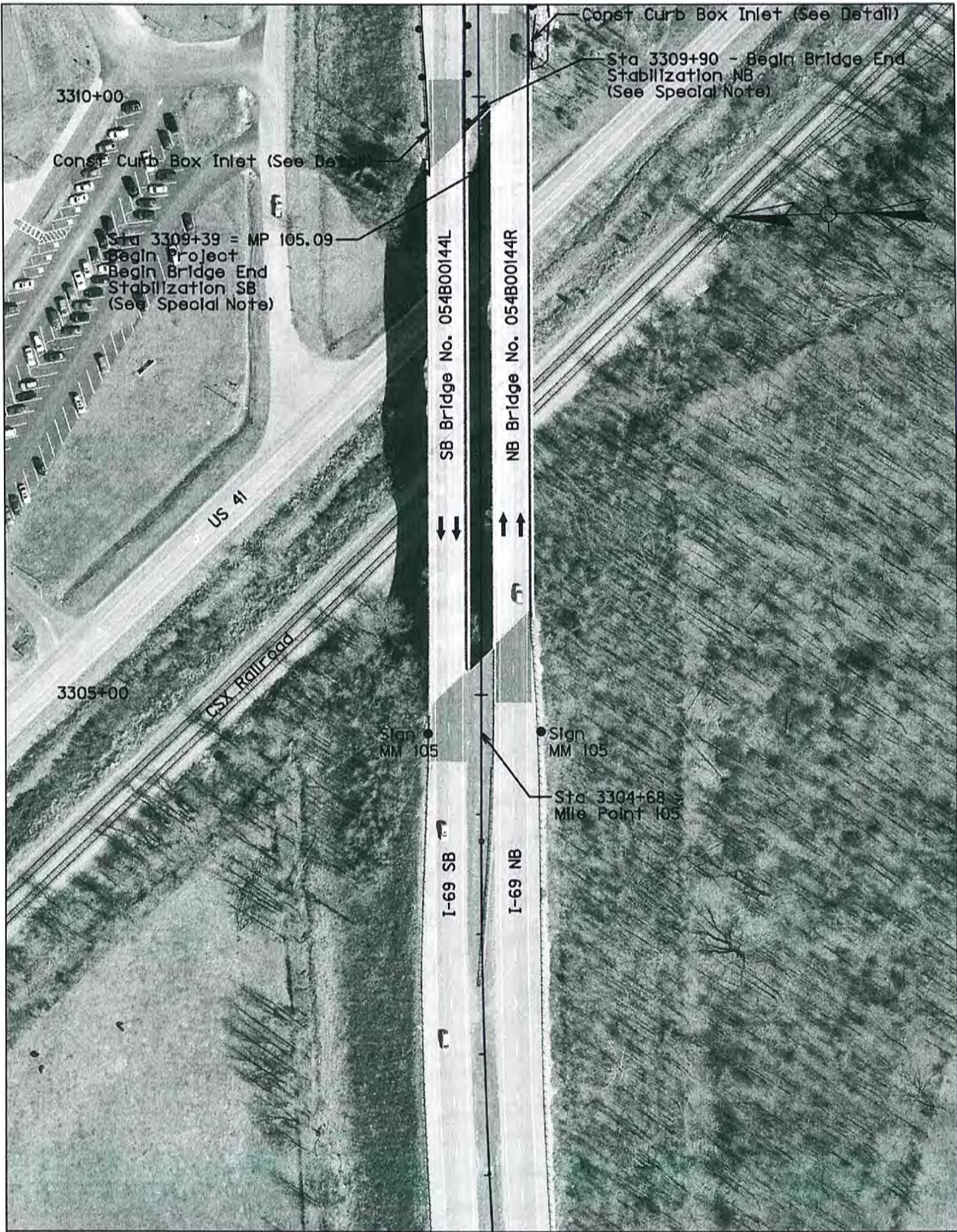


A 3" clearance from the end of the rebars to the face of the cap is to be maintained on all four sides of the cap.

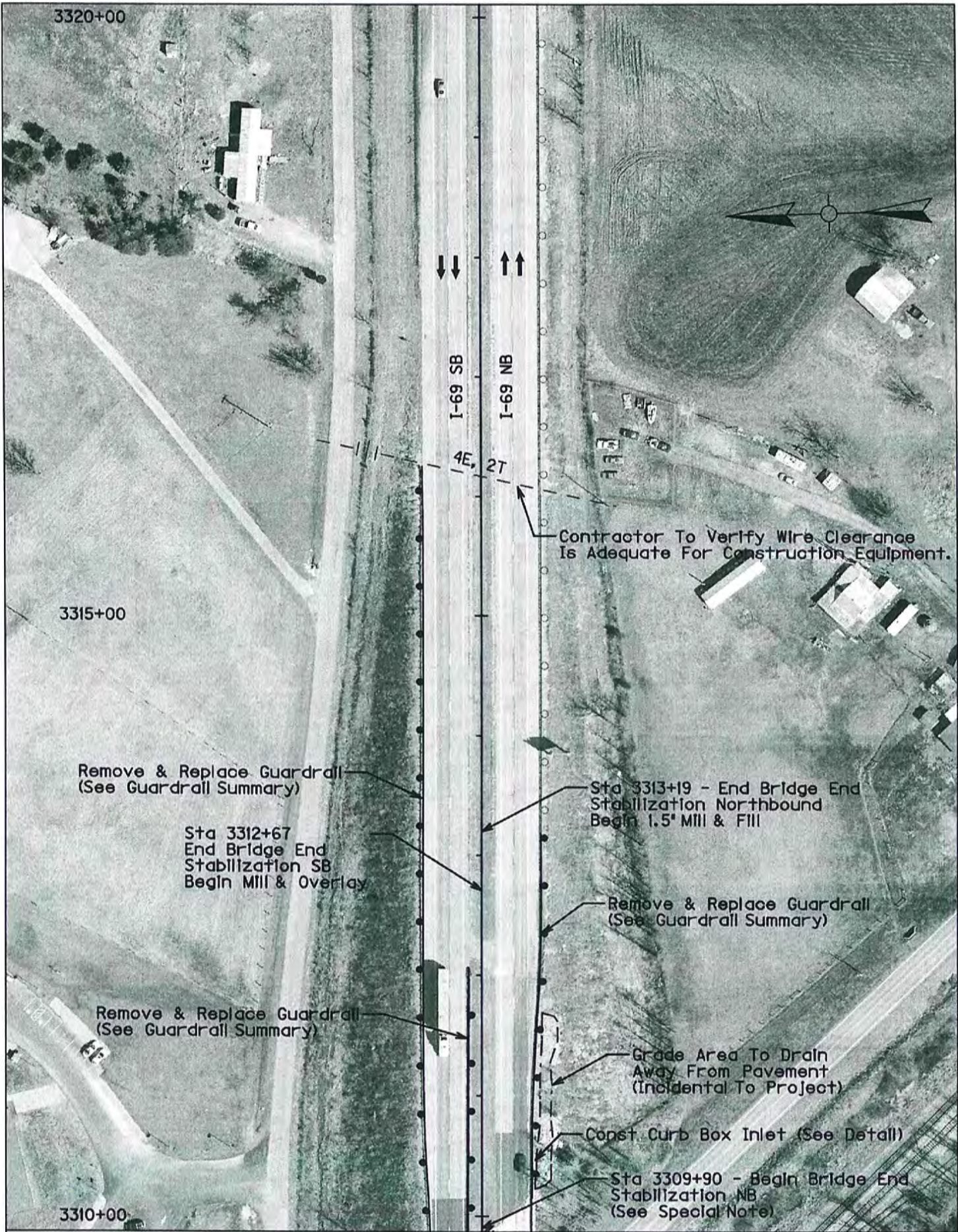
Estimated quantities for this work are provided on the Bridge Slope Protection Repairs Summary sheet.

I-69 PAVEMENT REHABILITATION
 HOPKINS COUNTY ITEM NO 2-2067.0 0

| BRIDGE SLOPE PROTECTION REPAIRS SUMMARY | | | | |
|--|------------|---------------|------------------|---------------------|
| BRIDGE NUMBERS 054B00145L AND 054B00145R | | | | |
| END BENT NO | LOCATION | ITEM | | |
| | | FLOWABLE FILL | CONCRETE CLASS A | STEEL REINFORCEMENT |
| | | (CUYD) | | (LBS) |
| 1 | WEST EB WB | 15 | 5 | 316 |
| 2 | EAST EB WB | 48 | 5 | 316 |
| 3 | WEST EB EB | 19 | 5 | 316 |
| 4 | EAST EB EB | 8 | 5 | 316 |
| PROJECT TOTALS | | 88 | 20 | 1,264 |



I-69 Plan - Scale 1" = 100' - Sheet 1 of 9 - Sta 3301+00 to Sta 3310+00



3320+00

3315+00

3310+00

I-69 SB
I-69 NB

4E, 2T

Contractor To Verify Wire Clearance Is Adequate For Construction Equipment.

Remove & Replace Guardrail
(See Guardrail Summary)

Sta 3312+67
End Bridge End
Stabilization SB
Begin Mill & Overlay

Remove & Replace Guardrail
(See Guardrail Summary)

Sta 3313+19 - End Bridge End
Stabilization Northbound
Begin 1.5" Mill & Fill

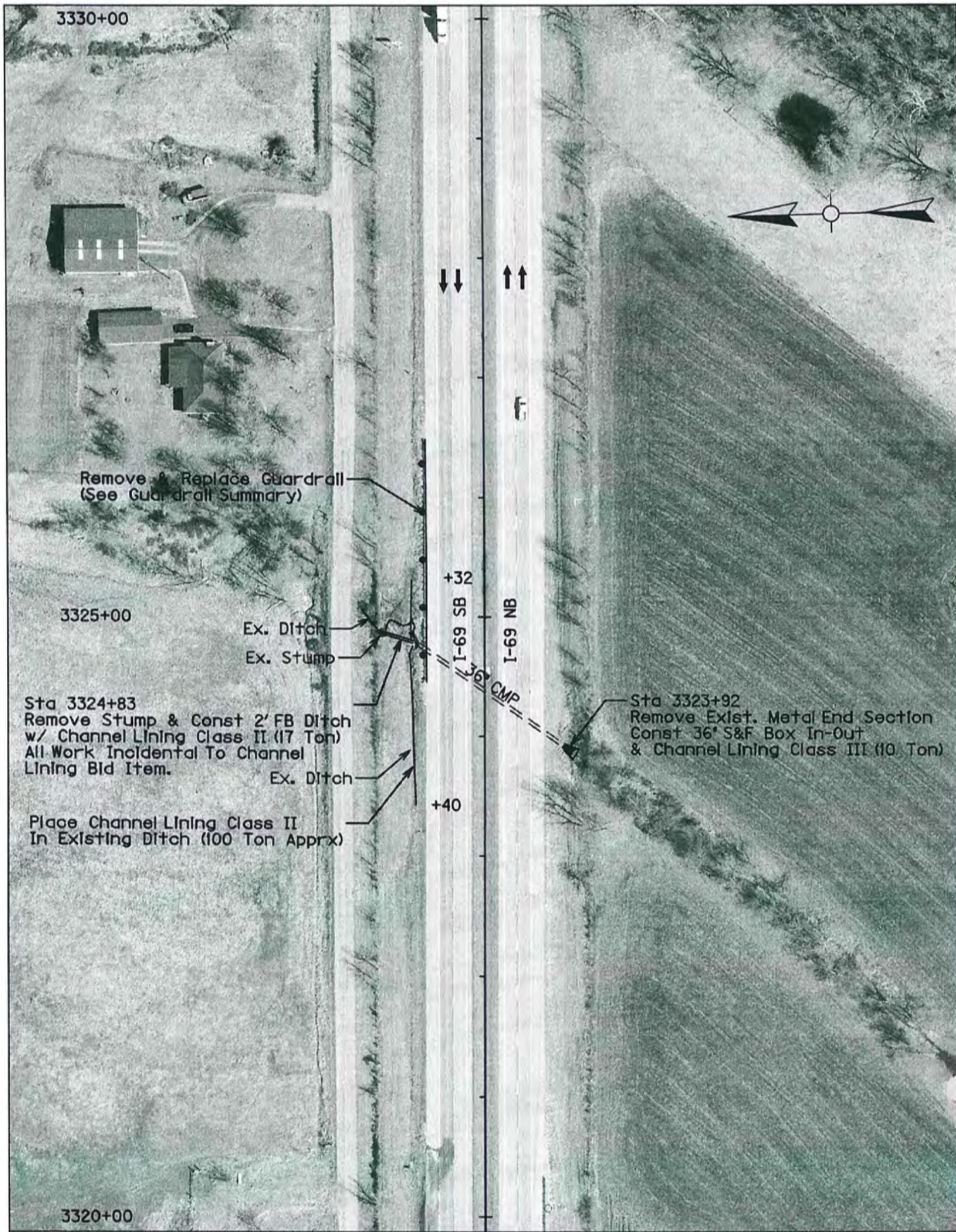
Remove & Replace Guardrail
(See Guardrail Summary)

Grade Area To Drain
Away From Pavement
(Incidental To Project)

Const Curb Box Inlet (See Detail)

Sta 3309+90 - Begin Bridge End
Stabilization NB
(See Special Note)

I-69 Plan - Scale 1" = 100' - Sheet 2 of 9 - Sta 3310+00 to Sta 3320+00



3330+00

3325+00

3320+00

Remove & Replace Guardrail
(See Guardrail Summary)

Ex. Ditch
Ex. Stump

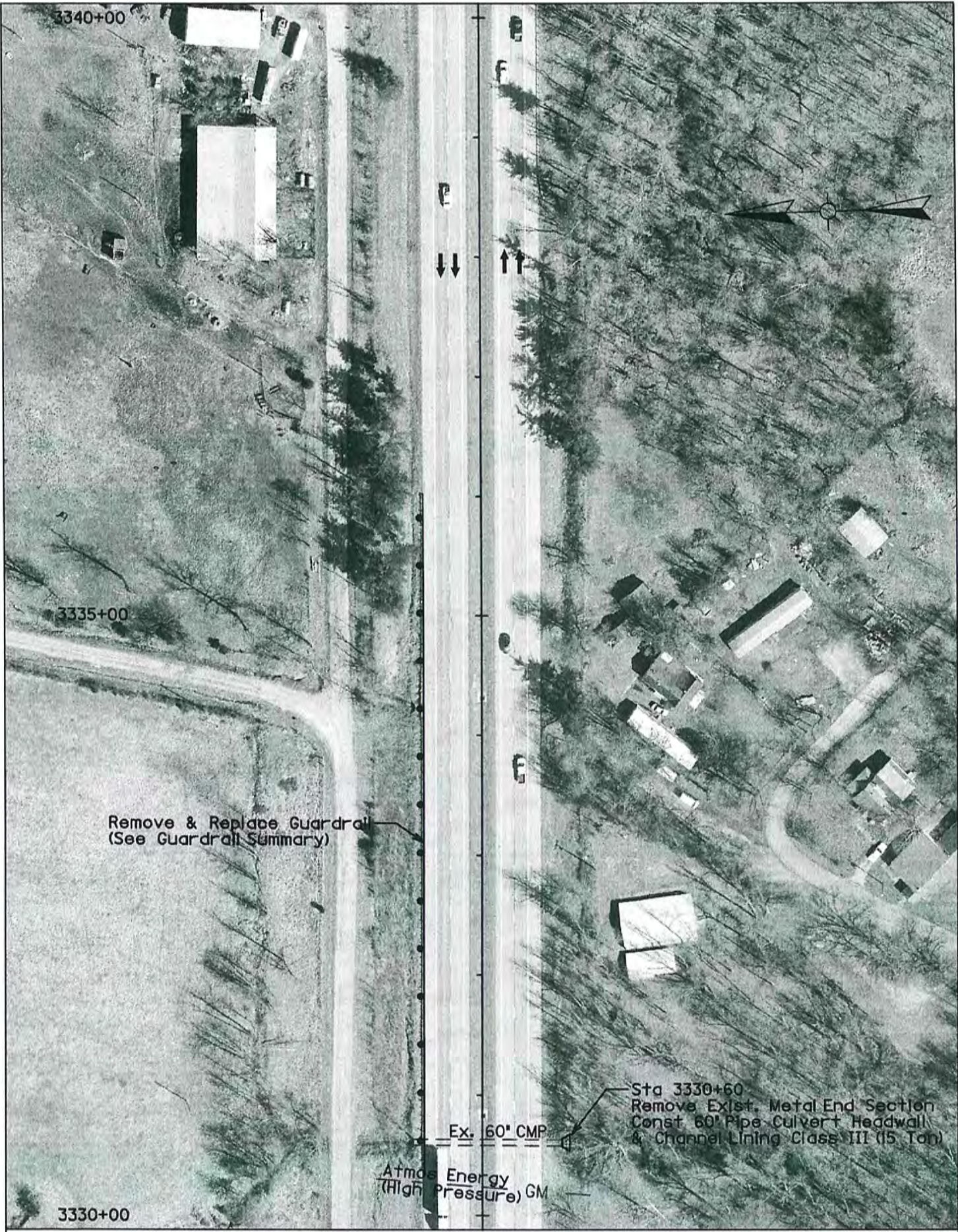
Sta 3324+83
Remove Stump & Const 2' FB Ditch
w/ Channel Lining Class II (17 Ton)
All Work Incidental To Channel
Lining Bid Item.

Place Channel Lining Class II
In Existing Ditch (100 Ton Apprx)

Sta 3323+92
Remove Exist. Metal End Section
Const 36' S&F Box In-Out
& Channel Lining Class III (10 Ton)

+32
I-69 SB
I-69 NB
36' CMP

+40



3340+00

3335+00

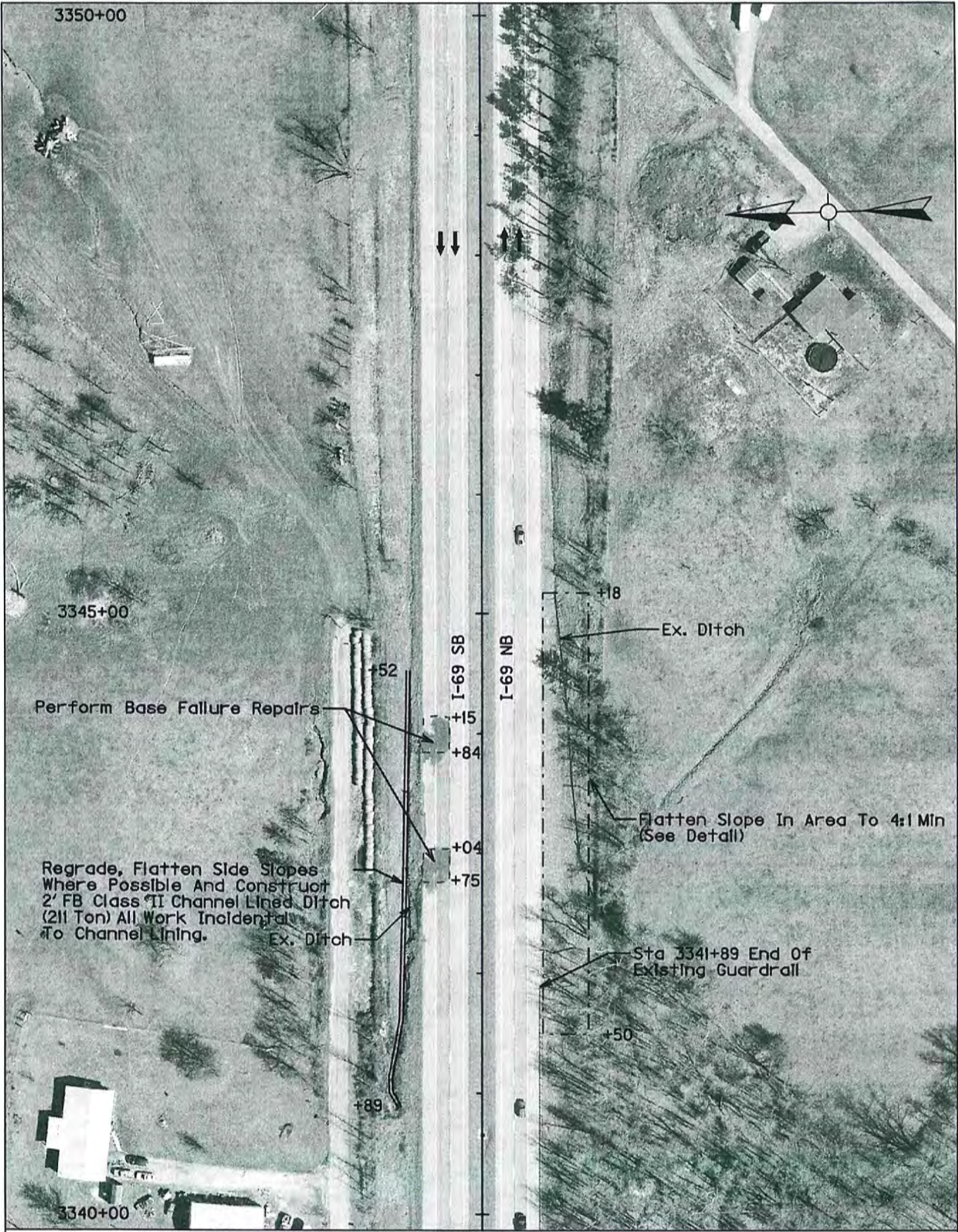
3330+00

Remove & Replace Guardrail
(See Guardrail Summary)

Ex. 60" CMP

Atmos Energy
(High Pressure) GM

Sta 3330+60
Remove Exist. Metal End Section
Const 60" Pipe Culvert + Headwall
& Channel Lining Class III (15 Ton)



3350+00

3345+00

3340+00



Perform Base Failure Repairs

Regrade, Flatten Side Slopes Where Possible And Construct 2' FB Class II Channel Lined Ditch (211 Ton) All Work Incidental To Channel Lining.

Ex. Ditch

Ex. Ditch

Flatten Slope In Area To 4:1 Min (See Detail)

Sta 3341+89 End Of Existing Guardrail

I-69 SB

I-69 NB

+52

+15

+84

+04

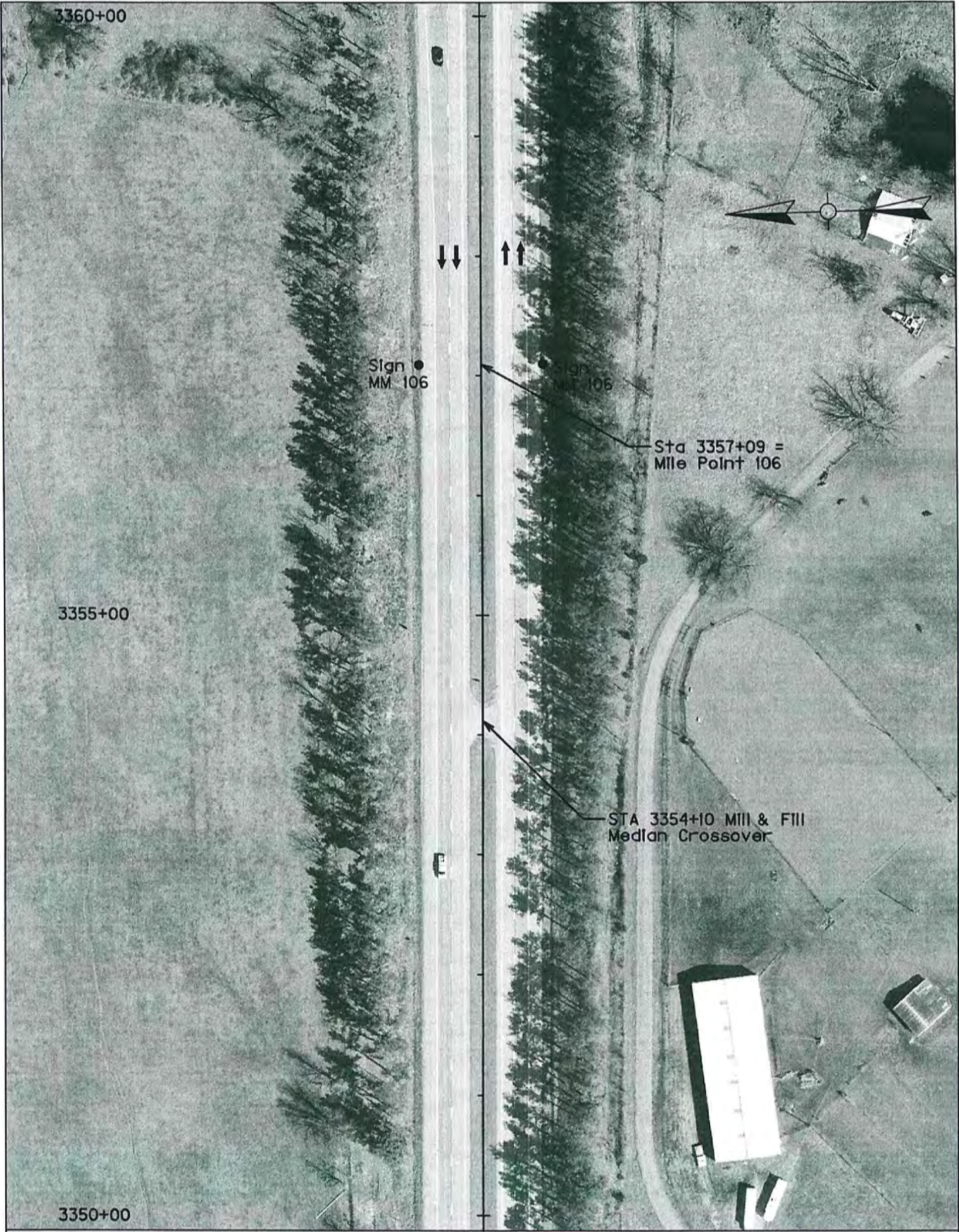
+75

+18

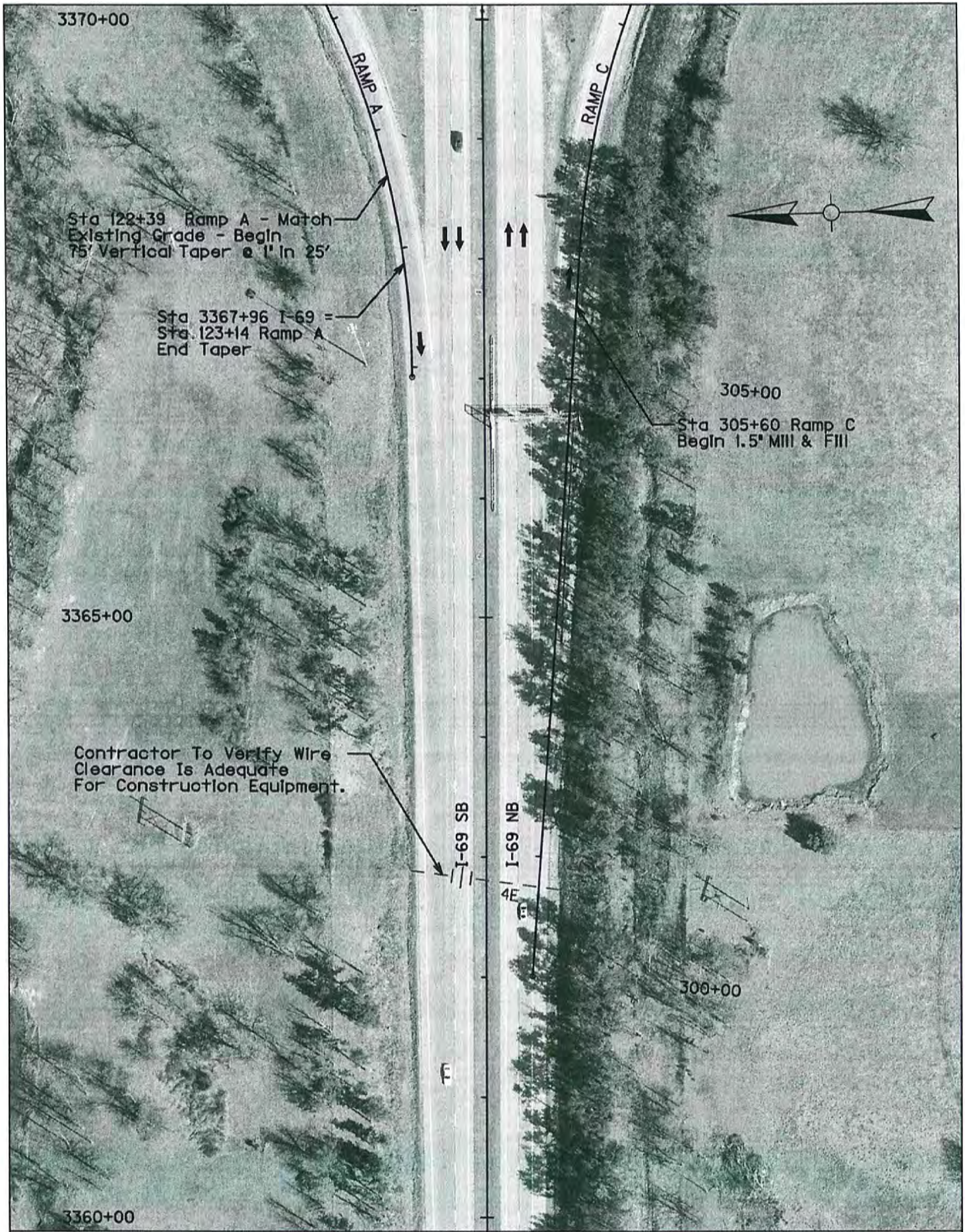
+50

+89

I-69 Plan - Scale 1" = 100' - Sheet 5 of 9 - Sta 3340+00 to Sta 3350+00



I-69 Plan - Scale 1" = 100' - Sheet 6 of 9 - Sta 3350+00 to Sta 3360+00



3370+00

Sta 122+39 Ramp A - Match
Existing Grade - Begin
75' Vertical Taper @ 1" in 25'

Sta 3367+96 I-69 =
Sta 123+14 Ramp A
End Taper

305+00

Sta 305+60 Ramp C
Begin 1.5" Mill & Fill

3365+00

Contractor To Verify Wire
Clearance Is Adequate
For Construction Equipment.

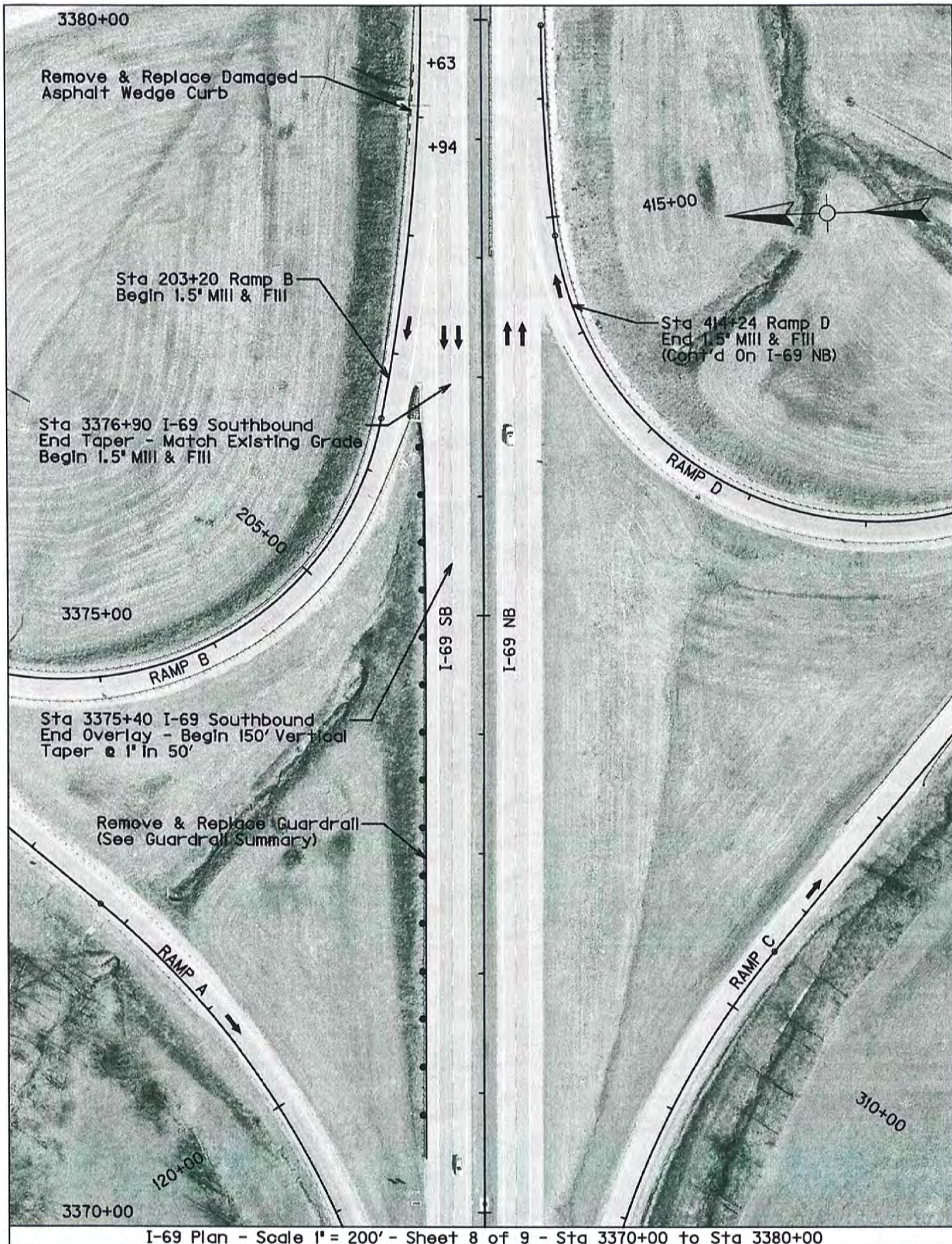
I-69 SB

I-69 NB

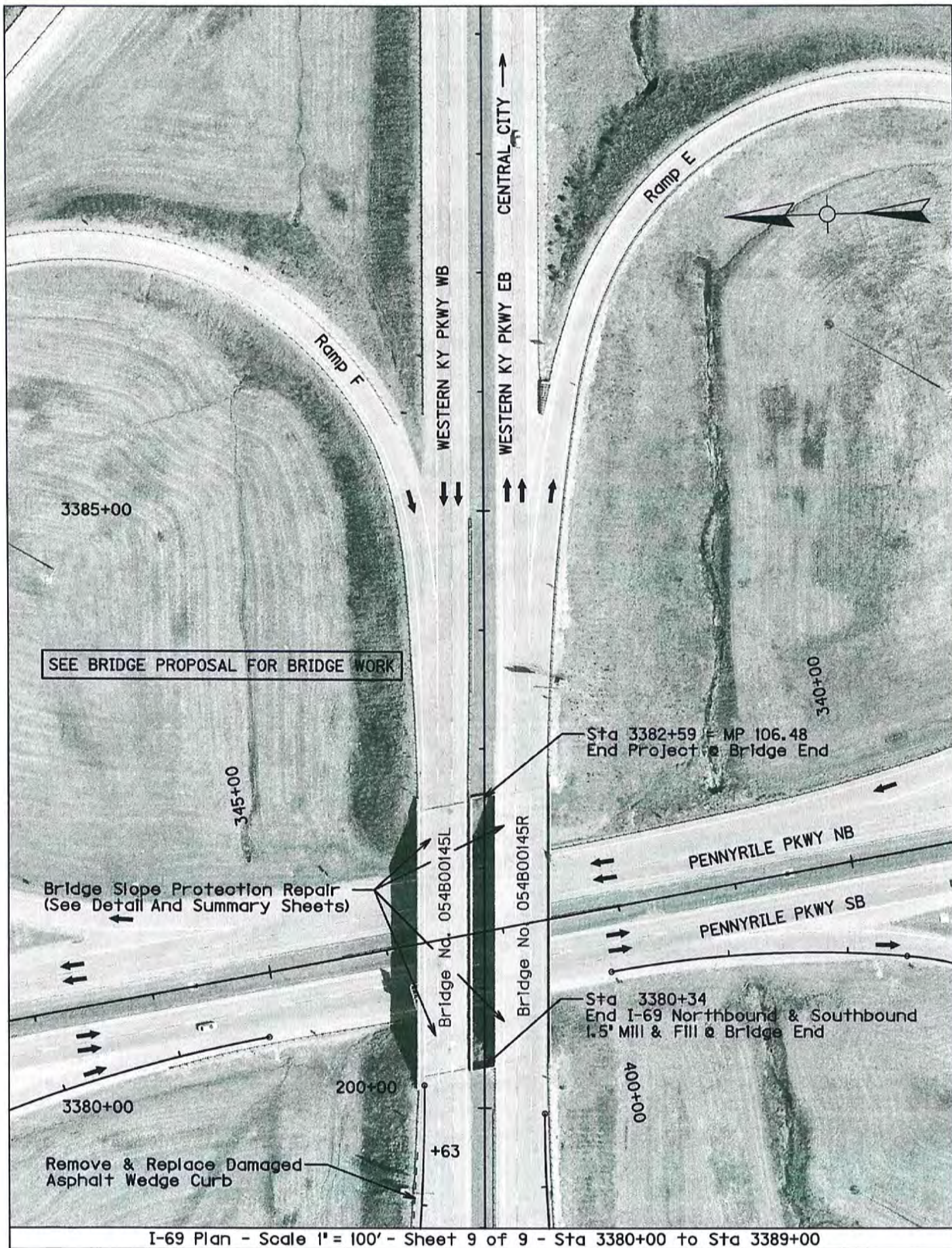
300+00

3360+00

I-95 Plan - Scale 1" = 100' - Sheet 7 of 9 - Sta 3360+00 to Sta 3370+00



I-69 Plan - Scale 1" = 200' - Sheet 8 of 9 - Sta 3370+00 to Sta 3380+00



SEE BRIDGE PROPOSAL FOR BRIDGE WORK

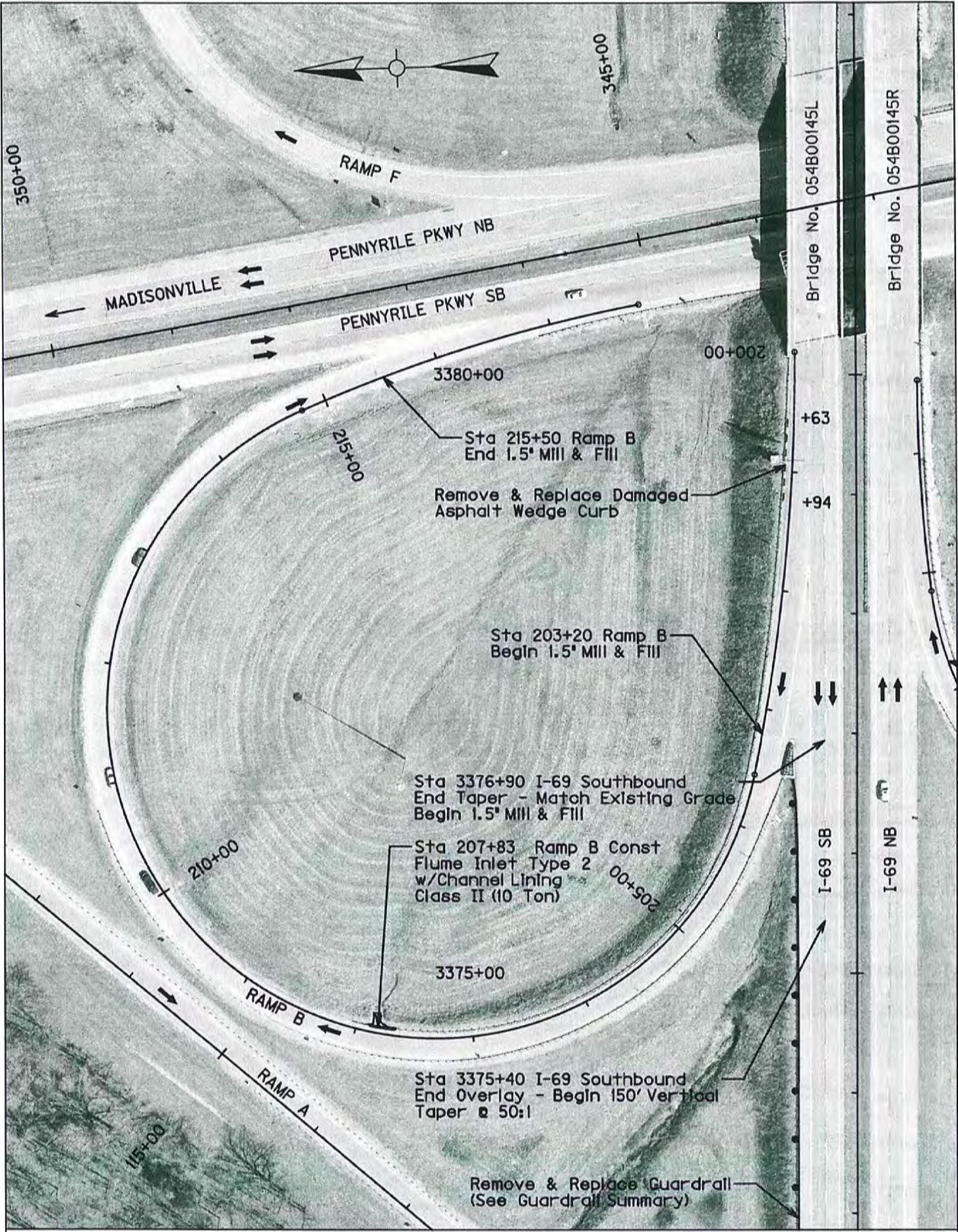
Bridge Slope Protection Repair
(See Detail And Summary Sheets)

Remove & Replace Damaged
Asphalt Wedge Curb

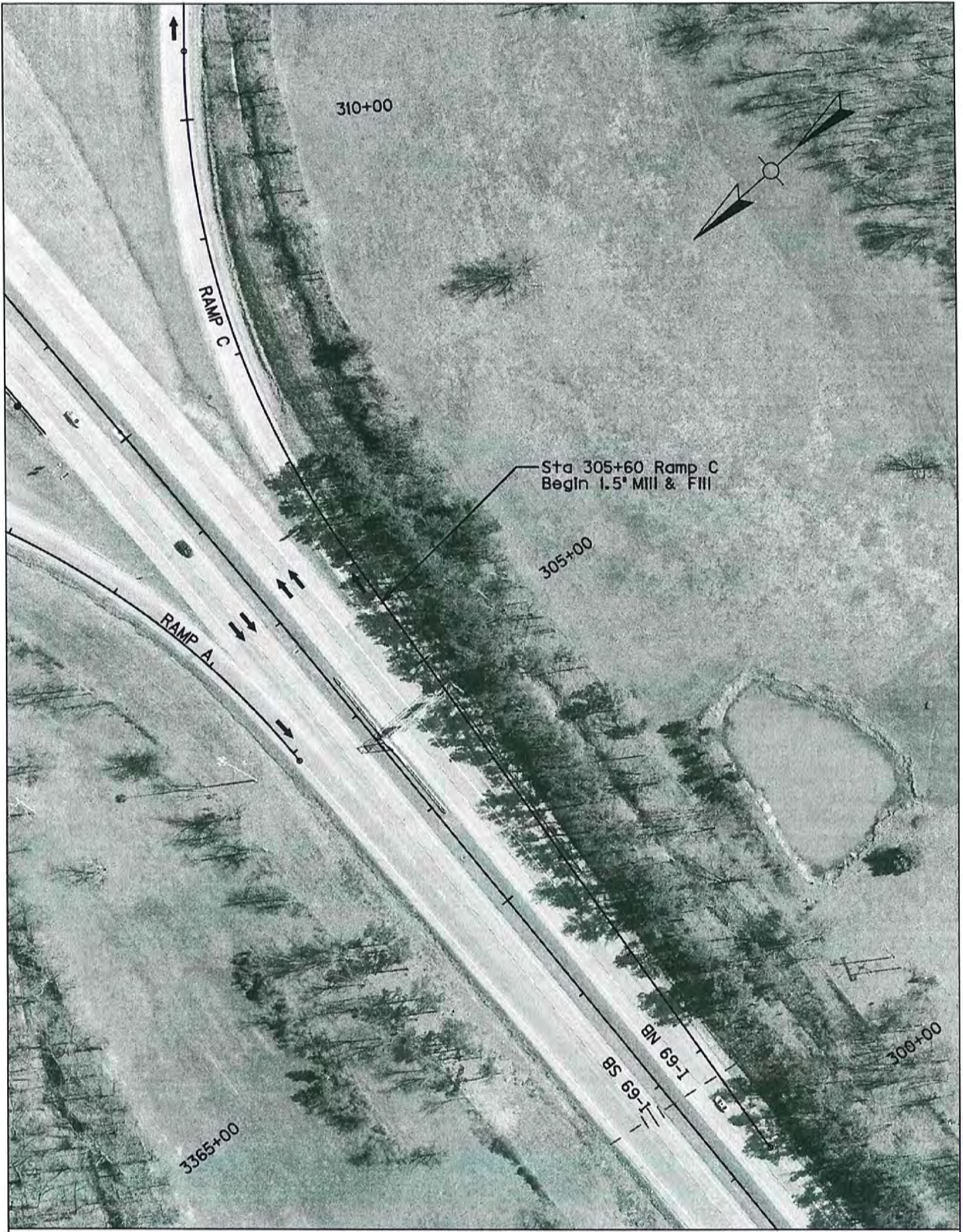
Sta 3382+59 = MP 106.48
End Project @ Bridge End

Sta 3380+34
End I-69 Northbound & Southbound
1.5' Mill & Fill @ Bridge End

I-69 Plan - Scale 1" = 100' - Sheet 9 of 9 - Sta 3380+00 to Sta 3389+00



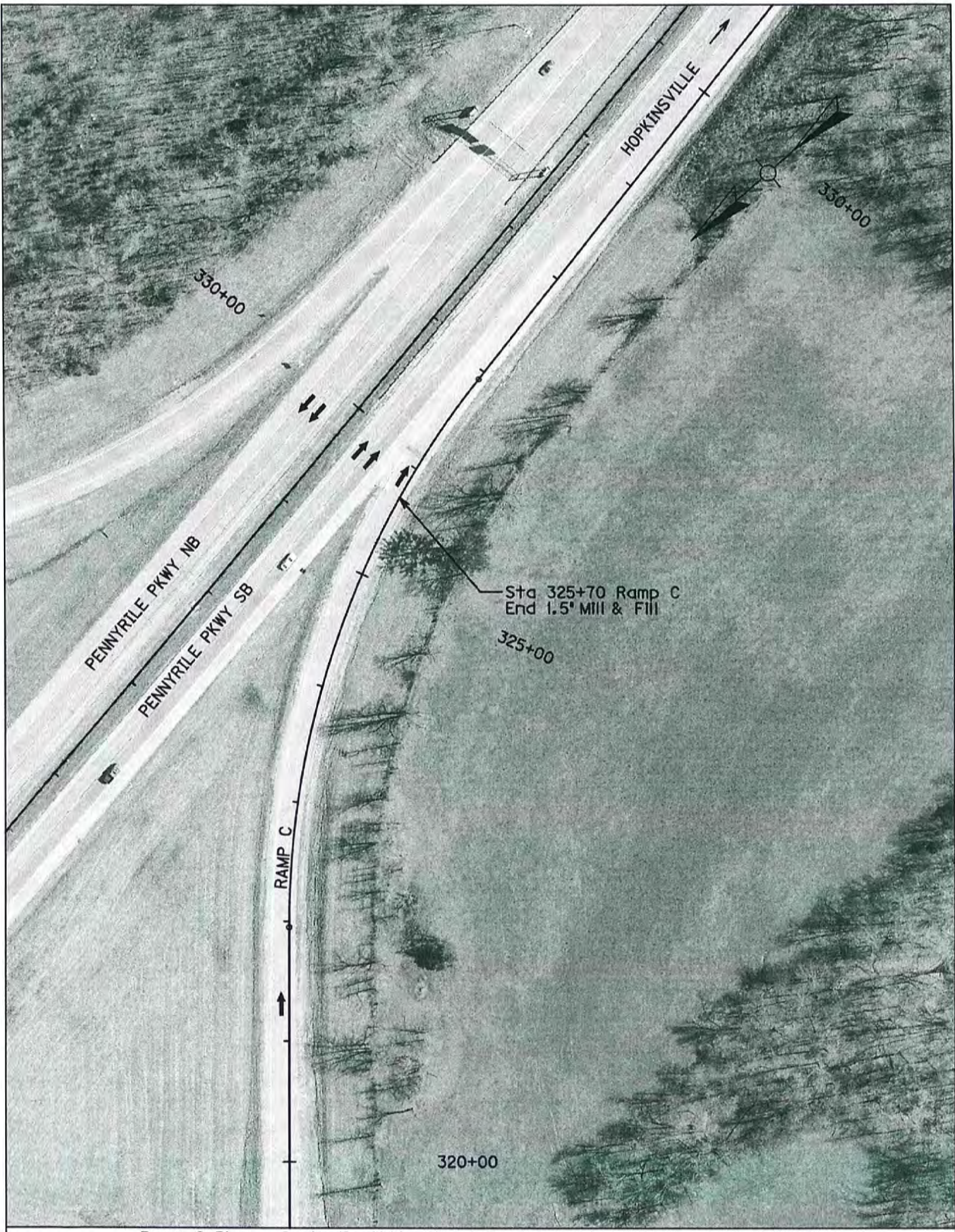
Ramp B Plan - Scale 1" = 100' - Sheet 1 of 1



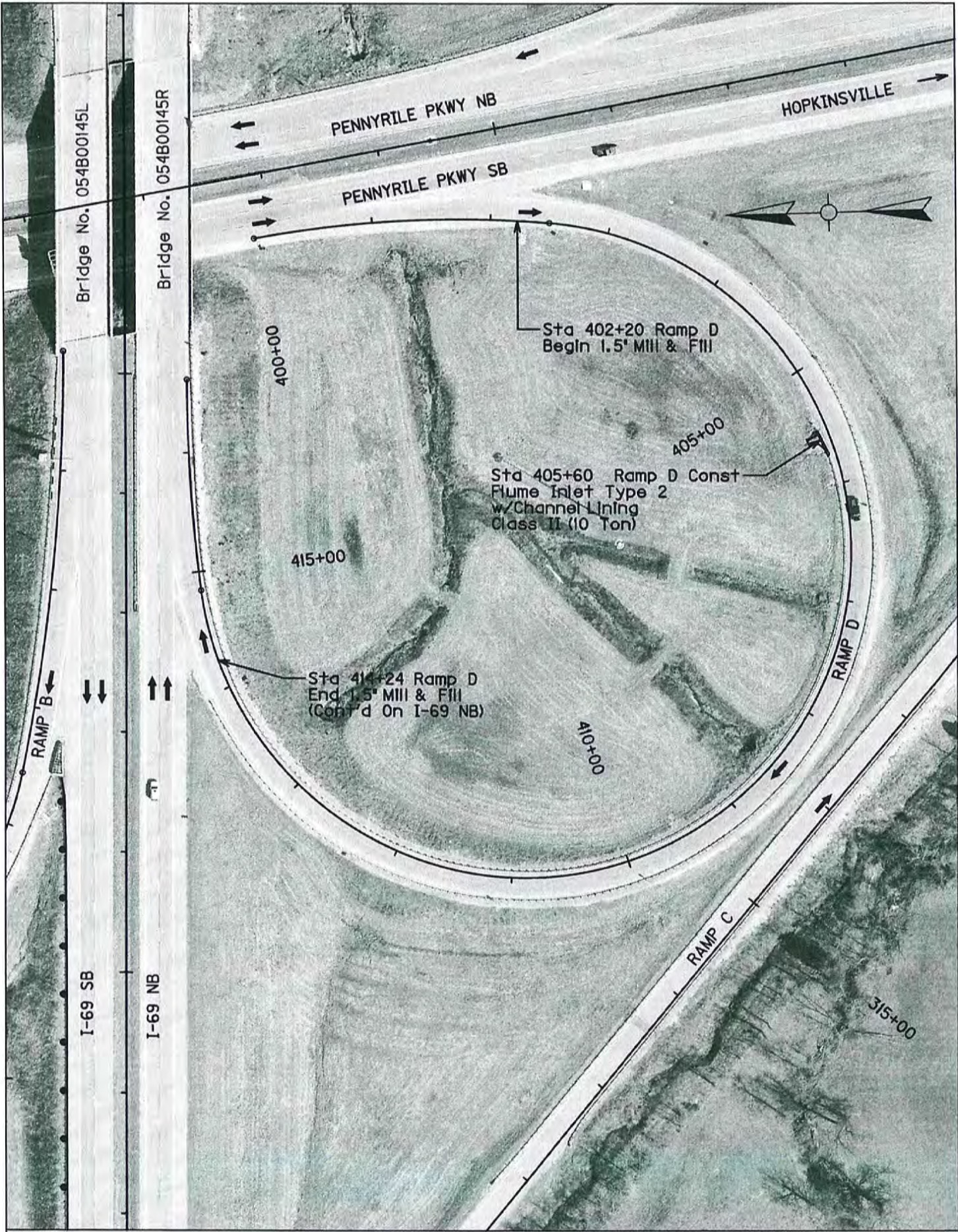
Ramp C Plan - Scale 1" = 100' - Sheet 1 of 3 - Sta 300+00 to Sta 310+00



Ramp C Plan - Scale 1" = 100' - Sheet 2 of 3 - Sta 310+00 to Sta 320+00



Ramp C Plan - Scale 1" = 100' - Sheet 3 of 3 - Sta 320+00 to Sta 330+00



Ramp D Plan - Scale 1" = 100' - Sheet 1 of 1

GENERAL NOTES
I-69
HOPKINS COUNTY
ITEM NO. 2-2067.00

| |
|--|
| THIS PROJECT IS A FULLY CONTROLLED ACCESS HIGHWAY |
|--|

I. GENERAL

Perform all work in accordance with the Department's 2012 Standard Specifications, Supplemental Specifications, applicable Special Provisions, and Standard and Sepia Drawings except as specified in these notes or elsewhere in this proposal. Article references are to the Standard Specifications.

(1) Maintain and Control Traffic; (2) Type V pavement markers; (3) Asphalt Pavement Milling and Texturing; (4) Asphalt Surface at locations listed and/or directed by the Engineer; and (5) All other work specified as part of this contract.

II. MATERIALS

Except as specified in these notes or on the drawings, all materials will be according to the Standard Specifications and applicable Special Provisions and Special Notes. The Department will sample and test all materials according to the Department's Sampling Manual and the Contractor will have the materials available for sampling a sufficient time in advance of the use of the materials to allow for the necessary time for testing, unless otherwise specified in these notes.

A. MAINTAIN AND CONTROL TRAFFIC. See Maintenance Of Traffic Plan.

B. PAVEMENT STRIPING-6 INCH PAINT. Use Durable Waterborne Marking 6 inch for permanent striping (12 inch at entrance and exit ramp tapers).

C. EROSION CONTROL BLANKET. Erosion Control Blanket is to be placed on any disturbed areas in the median, roadway side slopes, or other areas disturbed where work is required in the proposal (e.g., around replaced pipe culvert headwalls).

D. SEEDING AND PROTECTION. Seeding and Protection is to be used on all ditching areas when ditching is complete and used as directed by the Engineer. The Engineer is to specify the seed mixture to be used.

III. CONSTRUCTION METHODS

A. MAINTAIN AND CONTROL TRAFFIC. See Maintenance Of Traffic Plan.

B. SITE PREPARATION. Be responsible for all site preparation. This item shall include, but is not limited to, clearing and grubbing, excavation and backfilling, embankments, removal

of obstructions or any other items, and disposal of materials. All site preparation shall be only as approved or directed by the Engineer. Except for the bid items listed, site preparation will not be measured for payment but shall be incidental to the other items of work.

- C. MILLING AND PAVING.** After milling, where milling is called for in the proposal, correct settlement over pipes and culverts and remove de-bonded or flaking courses.
- D. DISPOSAL OF WASTE.** Dispose of all cuttings, debris, and other waste off the right-of-way at approved sites obtained by the Contractor at no additional cost to the Department. The Contractor will be responsible for obtaining any necessary permits for this work. Temporary openings in the right-of-way fence for direct access to waste sites off the right-of-way or for access to other public roads will not be allowed. No separate payment will be made for the disposal of waste and debris from the project or obtaining the necessary permits, but will be incidental to the other items of the work. Disposal of waste may be allowed on site at the discretion of the Engineer.
- E. FINAL DRESSING, CLEANUP, AND SEEDING.** After all work is completed, completely remove all debris from the job site. Perform Final Dressing Class A on all disturbed areas. This item is incidental to the other items of the work. Sow all disturbed earthen areas with the seed mixtures specified by the Engineer or place Erosion Control blanket on the areas if directed to do so by the Engineer.
- F. PAVEMENT STRIPING AND PAVEMENT MARKERS.** Permanent striping will be in accordance with Section 112, except that:
- (1) Striping will be 6" in width, except 12" in gore area;
 - (2) Permanent Striping will be in place before a lane is opened to traffic;
 - (3) Permanent striping will be 6" Durable Waterborne Marking;
 - (4) Existing pavement marker removal shall be incidental to installation of the new pavement markers.
- G. ON SITE INSPECTION.** Each Contractor submitting a bid for this work shall make a thorough inspection of the site prior to submitting a bid and shall be thoroughly familiarized with existing conditions so that the work can be expeditiously performed after a contract is awarded. Submission of a bid will be considered evidence of this inspection having been made. The Department will not honor any claims resulting from site conditions.
- H. PROPERTY DAMAGE.** The Contractor shall be responsible for all damage to public and/or private property resulting from the Contractor's work. Restore all disturbed features in like kind materials and design to the existing or proposed grades, as applicable, at no additional cost to the Department.
- I. CAUTION.** Information shown on the drawings and in this proposal and the types and quantities of work listed are not to be taken as an accurate or complete evaluation of the

material and conditions to be encountered during construction. The bidder must draw his own conclusion as to the conditions encountered. The department does not give any guarantee as to the accuracy of the data and will not consider any claim for additional compensation if the conditions encountered are not in accordance with the information shown.

- J. UTILITY CLEARANCE.** Do not disturb existing overhead or underground utilities. It is not anticipated that any utility facilities will need to be relocated and/or adjusted; however, in the event that it is discovered that the work does require that utilities be relocated and/or adjusted, the utility companies will work concurrently with the Contractor while relocating their facilities. The Contractor shall be responsible for repairing all utility damage that occurs as a result of his operations at no additional cost to the Department.

IV. METHOD OF MEASUREMENT

Except as specified in these notes, or elsewhere in the drawings or this proposal, the method of measurement will be in accordance with the Standard Specifications.

- A. MAINTAIN AND CONTROL TRAFFIC.** See Maintenance Of Traffic Plan.
- B. SITE PREPARATION.** Other than the bid items listed, the Department will not measure Site Preparation for payment but shall be incidental to other items of work.
- C. RAISED PAVEMENT MARKERS AND PERMANENT STRIPING.** Permanent striping Durable Waterborne Marking (6" and 12") is measured per linear foot. See Traffic Control Plan. Type V Pavement Markers are measured as each.

V. BASIS OF PAYMENT

Except as specified in these notes, or elsewhere in the drawings or this proposal, basis of payment will be in accordance with the Standard Specifications. No direct payment will be made other than for the bid items listed. All other items required to complete the construction will be incidental to the bid items listed. Existing signs damaged by the Contractor will be replaced by the Contractor at the Contractor's expense.

- A. MAINTAIN AND CONTROL TRAFFIC.** See Maintenance Of Traffic Plan.
- B. SITE PREPARATION.** Other than the bid items listed, no direct payment will be allowed for site preparation, but will be incidental to the other items of work.
- C. RAISED PAVEMENT MARKERS AND PERMANENT STRIPING.** See the General Summary sheet.

**GENERAL NOTE 444
ASPHALT PAVEMENT RIDE QUALITY
HOPKINS COUNTY
ITEM NO. 2-2067.00**

Pavement Rideability Requirements, in accordance with Section 410 of the Standard Specifications, current edition, shall apply on this project. Category A shall apply.

**GENERAL NOTE 447
COMPACTION OF ASPHALT MIXTURES
HOPKINS COUNTY
ITEM NO. 2-2067.00**

Will accept the compaction of asphalt mixtures furnished for the driving lanes and ramps at one inch or greater on this project by option A according to Subsections 402 and 403 of the Standard Specifications, current edition. Use joint cores as described in Subsection 402.03.02 for surface mixtures only. Will accept the compaction of all other asphalt mixtures by option B.

**TRAFFIC CONTROL PLAN
HOPKINS COUNTY
I-69
Item No. 2-2067**

**THIS PROJECT IS A FULLY
CONTROLLED ACCESS HIGHWAY**

TRAFFIC CONTROL GENERAL

Except as provided herein, "Maintain and Control Traffic" shall be in accordance with the 2012 Standard Specifications and the Standard Drawings, current editions. Except for the roadway and traffic control bid items listed, all items of work necessary to maintain and control traffic will be paid at the lump sum bid price to "Maintain and Control Traffic". All lane closures used on the Project will be in compliance with the appropriate Standard Drawings. Do NOT use cones for lane closures or shoulder closures.

Contrary to Section 106.01, traffic control devices used on this project may be new, or used in like new condition at the beginning of the work and maintained in like new condition until completion of the work. Traffic control devices will conform to current MUTCD.

Reduce the speed limit in work areas to 55 miles per hour and establish double fines for work zone speeding violations. The extent of these areas within the project limits will be restricted to the proximity of actual work areas as determined by the Engineer. Notify the Engineer a minimum of 12 hours prior to using the double fine signs. At the beginning of the work zone, the "WARNING FINE DOUBLED IN WORK ZONE" signs will be dual mounted. At the end of the work zone, the "END DOUBLE FINE" signs will be dual mounted as well. Remove or cover the signs when the highway work zone does not have workers present for more than a two-hour period of time. Payment for the signs will be at the unit bid price for signs erected. Any relocation or covering of the signs will be incidental to "Maintain and Control Traffic," lump sum.

PROJECT PHASING & CONSTRUCTION PROCEDURES

Other than the holidays listed in the 2012 Standard Specifications, the Engineer may specify additional days and hours when lane closures are not allowed. Traffic may be reduced to one lane in each direction at all other times.

All diversions to access ramps in areas of lane closures shall be approved by the Engineer prior to implementing the particular lane closure

Note that lane closures are required for the project. Stripe and taper according to the MUTCD and Standard Drawings.

During the days and hours when a lane closure is allowed, implement the following procedures: Maintain traffic as specified in the phasing notes and typical sections.

The contractor must notify the Engineer at least fourteen (14) days prior to the beginning of each construction phase in either direction.

PHASE I

I-69 NB

Close the inside lane and shoulder to traffic. Mill 1.5 inches of surface pavement on the inside lane and shoulder then place 1.5 inches of surface pavement on the milled lane and shoulder.

I-69 SB

Close the inside lane and shoulder to traffic. Mill 1.5 inches of surface pavement on the inside lane and shoulder then place 3 inches of asphalt base course followed by 1.5 inches of surface pavement on the milled lane and shoulder.

Perform the bridge work on the inside lane, half of the center lane, and shoulder of the bridge over Pennyrile Parkway.

Roadbed Stabilization At Bridge Ends

Perform the roadbed stabilization work at the east end of the I-69 (NB and SB) bridges over US 41 for the portion of the road closed to traffic during Phase I. Contractor must notify the Engineer 24 hours prior to beginning roadbed stabilization work and verify that the local weather forecast is favorable until work may be completed. Once begun, the contractor must work continuously until the roadbed stabilization is complete.

Complete all guardrail and shoulder work, and any other work shown in the plans for the inside shoulder and median area.

PHASE II

I-69 NB

Close the outside lane and shoulder to traffic. Mill 1.5 inches of surface pavement on the outside lane and shoulder then place 1.5 inches of surface pavement on the milled lane and shoulder.

I-69 SB

Close the outside lane and shoulder to traffic. Mill 1.5 inches of surface pavement on the outside lane and shoulder then place 3 inches of asphalt base course followed by 1.5 inches of surface pavement on the milled lane and shoulder.

Perform the bridge work on the outside lane, half of the center lane, and shoulder of the bridge over Pennyrile Parkway.

Roadbed Stabilization At Bridge Ends

Perform the roadbed stabilization work at the east end of the I-69 (NB and SB) bridges over US 41 for the portion of the road closed to traffic during Phase II. Contractor must notify the Engineer 24 hours prior to beginning roadbed stabilization work and verify that the local weather forecast is favorable until work may be completed. Once begun, the contractor must work continuously until the roadbed stabilization is complete.

Complete all guardrail and shoulder work, and any other work shown in the plans for the outside shoulder, side slopes, ditches and roadway drainage.

PHASE III – PERMANENT STRIPING

After all other work is completed, or when approved by the Engineer, place permanent striping. Mobile operations may be utilized.

RAMP WORK

The Contractor may close a ramp for 12 consecutive hours at a time approved by the Engineer to perform all pavement work listed in the proposal for that ramp, including permanent striping. Only one ramp may be closed at a time unless otherwise approved by the Engineer.

Alternatively, the Contractor may choose to perform the ramp work under part-width construction while the ramp remains open to traffic.

BRIDGE SLOPE PROTECTION REPAIR

Slope protection repair of the 4" concrete slab in front of the end bents for the twin bridges over the Pennyrile Parkway may be performed at any time during the life of the project. Work is to be performed using shoulder closures on the Pennyrile Parkway.

LANE CLOSURES

Limit the lengths of lane closures to only that needed for actual operations in accordance with the phasing specified herein, or as directed by the Engineer up to a maximum of two miles long. Only one lane closure in each direction at any time will be permitted. Contrary to section 112, lane closures will **NOT** be measured for payment, but are considered incidental to "Maintain and Control Traffic," lump sum.

SIGNS

Additional traffic control signs in addition to normal lane closure signing detailed on the Standard Drawings may be required by the Engineer. Additional signs needed for lane closures may include, but are not limited to, dual mounted TRUCKS USE LEFT/RIGHT LANE, LEFT/RIGHT LANE

CLOSED 1 MILE, LEFT/RIGHT LANE CLOSED 2 MILE, LEFT/RIGHT LANE CLOSED 3 MILE, SLOWED/STOPPED TRAFFIC AHEAD. Signage for reduced speed limits and double fine work zones will be furnished, relocated, and maintained by the Contractor.

Contrary to section 112, individual signs will be measured only once for payment, regardless of how many times they are set, reset, removed, and relocated during the duration of the project. Replacements for damaged signs or signs directed to be replaced by the Engineer due to poor legibility or reflectivity will not be measured for payment.

A quantity of signs has been included for lane shifts, "Roadwork Ahead" signs on entrance ramps, and extra double fine signs and speed limit signs between interchanges to be paid only once no matter how many times they are moved or relocated.

FLASHING ARROWS

Flashing arrows will be paid for once, no matter how many times they are moved or relocated. The Department **WILL NOT** take possession of the flashing arrows upon completion of the work.

PORTABLE CHANGEABLE MESSAGE SIGNS

Provide portable changeable message signs (PCMS) in advance of and within the project at locations to be determined by the Engineer. If work is in progress concurrently in both directions provide additional PCMS. Place PCMS one mile in advance of the anticipated queue at each lane closure. As the actual queue lengthens and/or shortens relocate or provide additional PCMS so that traffic has warning of slowed or stopped traffic at least one mile but not more than two miles before reaching the end of the actual queue. The locations designated may vary as the work progresses. The messages required to be provided will be designated by the Engineer. The PCMS will be in operation at all times. In the event of damage or mechanical/electrical failure, the contractor will repair or replace the PCMS immediately. PCMS will be paid for once, no matter how many times they are moved or relocated. The Department **WILL NOT** take possession of the signs upon completion of the work.

TRUCK MOUNTED ATTENUATORS

Furnish and install MUTCD approved truck mounted attenuators (TMA) in advance of work areas when workers are present less than 12 feet from traffic. If there is less than 500 feet between work sites, only a single TMA will be required at a location directed by the Engineer. Locate the TMAs at the individual work sites and move them as the work zone moves within the project limits. All details of the TMA installations shall be approved by the Engineer. TMA will not be measured for payment, but are incidental to "Maintain and Control Traffic," lump sum. The Department **WILL NOT** take possession of the TMAs upon completion of the work.

PAVEMENT MARKINGS

If lane closures are in place during nighttime hours, remove or cover the lenses of raised pavement markers that do not conform to the traffic control scheme in use, or as directed by the Engineer. Replace or uncover lenses before a closed lane is reopened to traffic. No direct payment will be made for removing and replacing or covering and uncovering the lenses, but will be incidental to "Maintain and Control Traffic," lump sum.

Place temporary and permanent striping in accordance with Section 112, except that:

1. Temporary and permanent striping will be 6" in width
2. If the contractor's operations or phasing requires temporary markings which must be subsequently removed from the ultimate pavement, an approved removable lane tape will be used.
3. Edge lines will be required for temporary striping
4. Existing, temporary, or permanent striping will be in place before a lane is opened to traffic
5. Place permanent striping on bridge decks and pavement within the project limits.
6. Permanent striping will be Durable Waterborne Markings

Should the Contractor change the existing striping pattern, the Contractor is to restripe the roadway back to its original configuration after a certain period of time especially if no work is anticipated for a period of time (i.e. Winter shutdown).

PAVEMENT EDGE DROP-OFFS

Pavement edge drop-offs will be protected by a lane or shoulder closure. Lane closures will be protected with plastic drums, vertical panels, or barricades as shown on the Standard Drawings.

Pavement edges that traffic is not expected to cross, except accidentally, shall be treated as follows:

Less than 2" – Protect with a lane closure.

2" to 4" – Protect with a lane closure. Place plastic drums, vertical panels, or barricades every 50 feet. Cones may not be used in place of plastic drums, panels, and barricades at any time. Construct a wedge with compacted cuttings from milling, trenching, or asphalt mixtures with a 3:1 or flatter slope, when work is not active in the drop-off area. Place Type III Barricades at the beginning of the lane closures, and place additional Type III Barricades spaced at 2,500 feet during the time the lane closure is in place.

4" and greater - Drop-offs 4" or greater will be allowed during duration of the project. Protect with a lane or shoulder closure using drums or barricades; cones will not be allowed for lane or shoulder closures for drop-offs 4 inches or greater. Place drums or barricades with spacing not to exceed 50 feet. Place Type III Barricades facing

oncoming traffic at each drop off. If for any reason traffic must be maintained less than 6 feet from the drop off, wedge with DGA with 3:1 or flatter slope when work is not actively in progress in the drop-off area. Once excavation begins, work continuously to construct DGA and asphalt base to eliminate the drop-off. Drop-offs greater than 4 inches within 6 feet of traffic will not be allowed during non-working hours.

TRAFFIC COORDINATOR

Designate an employee to be traffic coordinator. The designated Traffic Coordinator must be certified by the American Traffic Safety Services Association (ATSSA). The Traffic Coordinator will inspect the project maintenance of traffic once daily, including weekends, during the Contractor's operations and at any time a lane closure is in place. The Traffic Coordinator will report all incidents throughout the work zone to the Engineer on the project. The Contractor will furnish the name and telephone number where the Traffic Coordinator can be contacted at all times.

During any period when a lane closure is in place, the Traffic Coordinator will arrange for personnel to be present on the project at all times to inspect the traffic control, maintain the signing and devices, and relocate portable changeable message boards as queue lengths change. The personnel will have access on the project to a radio or telephone to be used in case of emergencies or accidents.

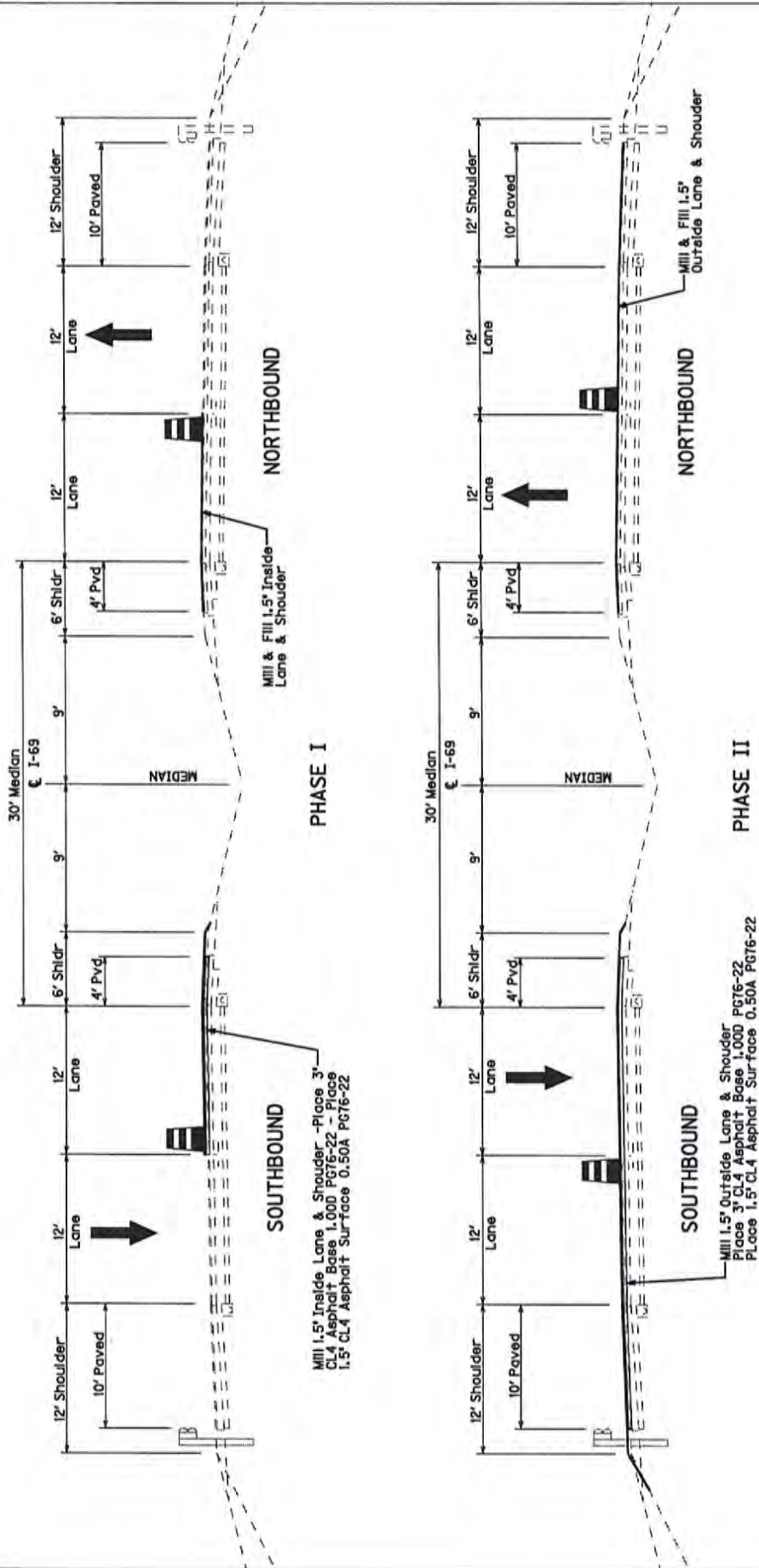
COORDINATION OF WORK

The Contractor is advised that other projects may be in progress within or in the near vicinity of this project. The traffic control of those projects may affect this project and the traffic control of this project may affect those projects. The Contractor will coordinate the work on this project with the work of the other contractors. In case of conflict, the Engineer will determine the relative priority to give to work phasing on the various projects.

CONTRACTOR'S AND CONTRACTOR'S EMPLOYEES' VEHICLES

Do not use or allow employees to use median crossovers at any time except when inside lanes are closed for construction. In all other phases of construction, change vehicular direction of travel only at interchanges.

I-69 MAINTENANCE OF TRAFFIC TYPICAL SECTIONS



NOTE: Place Joint Adhesive Between Driving Lanes And Between Driving Lane And Shoulders

NOT TO SCALE

**HOPKINS COUNTY
WESTERN KENTUCKY PARKWAY OVER
OVER PENNYRILE PARKWAY**

**PROJECT NUMBERS
FD04 SPP 054 0069 105-107**

**ITEM NUMBER
2-2067.00**

**BRIDGE REHABILITATION
(1 LOCATION)**

**STATION
3381+40**

DATE _____

PREPARED BY

**WMB, INC. CONSULTING ENGINEERS
1950 HAGGARD COURT
LEXINGTON, KY. 40505
PHONE 859/299-5226**

**HOPKINS COUNTY
WESTERN KENTUCKY PARKWAY OVER PENNYRILE PARKWAY**

**PROJECT NUMBERS
FD04 SPP 054 0069 105-107**

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**BRIDGE REHABILITATION
(1 LOCATION)**

**STATION
3381+40**

INDEX

ITEM

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BRIDGES

SPECIAL NOTE FOR BRIDGE RESTORATION AND WATER-
PROOFING WITH CONCRETE OVERLAYS

BRIDGE NO. 054B00145L WESTERN KENTUCKY OVER
PENNYRILE PARKWAY

SUMMARY OF BRIDGE QUANTITIES FOR I-69 PROJECT
PROJECT NO. FD04 SPP 054 0069 105-107
ITEM NO. 2-2067.00
HOPKINS COUNTY

ESTIMATED QUANTITIES REQUIRED

| <u>ITEM CODE</u> | <u>DESCRIPTION</u> | <u>QUANTITY</u> | <u>UNIT</u> |
|-------------------------|--------------------------------|------------------------|--------------------|
| 8551 | MACHINE PREP OF EXISTING SLAB | 1030.0 | SQ. YD. |
| 8549 | BLAST CLEANING | 1290.0 | SQ. YD. |
| 8504 | EPOXY SAND SLURRY | 250.0 | SQ. YD. |
| 8534 | CONCRETE OVERLAY-LATEX | 35.5 | CU. YD. |
| 8526 | CONC. CLASS M FULL DEPTH PATCH | 5.0 | CU. YD. |
| 3300 | ELIMINATE TRANSVERSE JOINT | 85.5 | LIN. FT. |

REFERENCES

THE SUPPLEMENTAL SPECIFICATIONS TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2012 EDITION AND THE FOLLOWING SPECIAL NOTES THAT APPLY TO ALL BRIDGES ARE FOUND IN THE ROADWAY PLANS FOR THIS PROJECT:

- **SPECIAL NOTE FOR CONTRACT COMPLETION DATE AND LIQUIDATED DAMAGES**
- **PROJECT PHASING AND MAINTENANCE OF TRAFFIC PLAN**
- **SEE ROADWAY PLANS FOR DETAILS AND QUANTITIES FOR REPAIR OF SLOPE PROTECTION UNDER THE TWO WESTERN KENTUCKY PARKWAY BRIDGES OVER THE PENNYRILE PARKWAY (BRIDGE NUMBERS 054B00145L AND 054B00145R)**

**SPECIAL NOTE FOR REPLACING EXPANSION DAMS AND/OR
INSTALLING ARMORED EDGES FOR CONCRETE ON BRIDGES**

I. DESCRIPTION.

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing concrete and expansion device(s) and/or bridge ends; (3) Install armored edges and new concrete as specified and in accordance with the attached detail drawings; (4) Install new joint seals (where required); (5) Maintain and control traffic; and (6) Any other work specified as part of this contract.

II. MATERIALS.

- A. Class "M" Concrete.** Use either "M1" or "M2". See Section 601.
- B. Structural Steel.** Use new, commercial grade steel suitable for welding. The Engineer will base acceptance on visual inspection. See Standard Drawing BJE-001, current edition.
- C. Stud Anchors.** The armored edge stud anchors are $\frac{3}{4}$ " x 6" embedded stud shear connectors conforming to ASTM A108, Grade 1015 (Nelson Studs or equal).
- D. Steel Reinforcement.** Use Grade 60. See Section 602.
- E. Epoxy Bond Coat.** See Section 511.
- F. Neoprene Joint Sealers (Compression Seals).** See Section 807.
- G. Silicone Rubber Sealant.** See Section 807.
- H. Neoprene Strip Seals.** See attached detail drawings and Section 807.

III. CONSTRUCTION.

- A. Remove Existing Materials.** Remove the existing expansion dam/bridge end and specified areas of concrete as shown on the attached sketches. Remove debris and/or expansion joint filler as directed by the Engineer. Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Expansion Joint Replacement" or "Armored Edge for Concrete".

Clean and leave all existing steel reinforcement encountered in place.

- B. Place New Concrete and Armored Edges.** After all specified existing materials have been removed; place new armored edges to match the grade of the proposed overlay or to match the original grade (See attached detail drawings). Place the new Class "M" concrete to the scarified grade and finish to receive the new overlay or place the new Class "M" concrete to the original grade and finish with broom strokes drawn transversely from curb to curb. No accelerants are to be added to Class "M" Concrete as specified in Section 601 of the Standard Specifications.

All new structural steel shall be cleaned and painted with two coats of commercial primer paint red orange in color, except that surfaces to come in contact with concrete are not to be painted.

Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

- C. Additional Steel Reinforcement.** Furnish for replacement, as directed by the Engineer, 300 linear feet of steel reinforcing bars ½" diameter by 20' lengths. Place these bars in areas deemed by the Engineer to require additional reinforcement. Field cutting and bending is permitted. Do not place any additional steel reinforcement above the height of the top row of Nelson Studs on the armored edges. Ensure that all exposed steel reinforcement is tied in accordance with Section 602.03.04 prior to pouring the new Class "M" concrete. Deliver unused bars to the Local County Maintenance Barn. Reinforcement is incidental to the contract unit price for "Expansion Joint Replacement".
- D. Stage Construction.** Installation of concrete and armored edges in two (or more if specified) stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.
- E. Preformed Neoprene Joint Seal.** Place the preformed joint seal in one continuous, unbroken length. Place neoprene compression seals as recommended by the manufacturer and in accordance with Section 609.03.04 (D). Place neoprene strip seals as recommended by the manufacturer and in accordance with Section 609.03.04 (E), except that shop drawings will not be required.
- F. Silicone Rubber Sealant.** Place the silicone sealant as recommended by the manufacturer and in accordance with Section 609.03.04 (C).
- G. Shop Plans.** Shop plans will not be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

IV. MEASUREMENT.

- A. Expansion Joint Replacement - 1 ½", 2", 2 ½", 4".** The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.
- B. Armored Edge for Concrete.** The Department will measure the quantity in linear feet from gutterline to gutterline along the face of the bridge end.
- C. Steel Reinforcement.** See Section 602.

V. PAYMENT.

- A. Expansion Joint Replacement - 1 ½", 2", 2 ½", 4".** Payment at the contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, neoprene joint seal, and all incidental items necessary to complete the work (except the overlay material) within the specified pay limits as specified by this note and as shown on the attached detail drawings.
- B. Armored Edge for Concrete.** Payment at the contract unit price per linear foot is full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete and all incidental items necessary to complete the work (except the overlay material) within the specified pay limits as specified by this note and as shown on the attached detail drawings.
- C. Steel Reinforcement.** Reinforcement is incidental to the contract unit price for "Expansion Joint Replacement".

The Department will consider payment as full compensation for all work required by this note and the attached detail drawings.

SPECIAL NOTE FOR ELIMINATING TRANSVERSE JOINTS ON BRIDGES

I. DESCRIPTION. Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Remove existing concrete to eliminate the transverse joint; (3) Install additional steel reinforcement, new armored edge and new concrete as specified and in accordance with the attached detail drawings; (4) Maintain and control traffic; and (5) Any other work specified as part of this contract.

II. MATERIALS.

A. Class "M" Concrete. Use either "M1" or "M2". See Section 601.

B. Steel Reinforcement. Use Grade 60. See Section 602.

C. Epoxy Bond Coat. See Section 511.

III. CONSTRUCTION.

A. Remove Existing Materials. Remove the existing transverse joints, joint filler, and specified areas of concrete as shown on the attached detail drawings or as directed by the Engineer. Dispose of all removed material entirely away from the job site. This work is incidental to the contract unit price for "Eliminate Transverse Joint".

Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired/replaced as directed by the Engineer at no additional cost to the Department.

B. Place New Concrete and Armored Edges. After all specified existing materials have been removed; place new armored edges to match the original grade (See attached detail drawings). Place the new Class "M" concrete to the original grade and finish with broom strokes drawn transversely from gutterline to gutterline. No accelerants are to be added to Class "M" Concrete as specified in Section 601 of the Standard Specifications.

All new structural steel shall be cleaned and painted with two coats of commercial primer paint red orange in color, except that surfaces to come in contact with concrete are not to be painted.

Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to

come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

- C. Steel Reinforcement.** Furnish for this work steel reinforcement as shown in the individual bridge packages. Splice these bars to the existing reinforcement in the deck and backwall in the areas of removed concrete as shown on the attached detail drawings or directed by the Engineer. Ensure that all exposed steel reinforcement is tied in accordance with Section 602.03.04 prior to pouring the new Class "M" concrete. Reinforcement is incidental to the contract unit price for "Eliminate Transverse Joint".

IV MEASUREMENT.

- A. Eliminate Transverse Joint.** The Department will measure the quantity in linear feet from gutterline to gutterline along the centerline of the joint.

V. PAYMENT.

- A. Eliminate Transverse Joint.** Payment at the contract unit price per linear foot is full compensation for removing and disposing of the specified existing materials, furnishing and installing the concrete, steel reinforcement, armored edge and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown on the attached detail drawings.

The Department will consider payment as full compensation for all work required by this note and the attached detail drawings.

**SPECIAL NOTE FOR BRIDGE RESTORATION AND WATERPROOFING
WITH CONCRETE OVERLAYS**

- I. DESCRIPTION.** Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.

This work consists of the following: (1) Furnish all labor, materials, tools, and equipment; (2) Machine preparation of existing slab or remove the existing overlay; (3) Place new concrete overlay and epoxy-sand slurry in accordance with Section 606; (4) Maintain and control traffic; and (5) Any other work specified as part of this contract.

All construction will be in accordance with Section 606 unless otherwise specified.

II. MATERIALS.

- A. Latex Concrete.** See Section 606.03.17.
B. Low Slump Concrete. See Section 606.03.18.
C. Class "M" Concrete. Use either "M1" or "M2". See Section 601.
D. Epoxy-Sand Slurry. See Section 606.03.18

III. CONSTRUCTION.

A. Remove Existing Overlay. In addition to Section 606.03.03, verify the presence and depth of the existing overlay and totally remove the existing concrete overlay by grinding or scarifying the deck to a depth slightly below or equal to the original bridge slab surface as required. In areas where the existing overlay has been removed, additional machine preparation of the existing slab is NOT required. When removal of an existing overlay is a pay item, no payment will be allowed for "Machine Preparation of Existing Slab". This work is incidental to the pay item "Removal of Existing Overlay – Square Yard".

B. Overlay. Place new overlay in accordance with Section 606.

C. Surface Texturing. Texture the concrete surface of the overlay in accordance with Section 609.03.10. The minimum thickness of the textured overlay shall be as follows:

Latex Cement Concrete – 1 ¼"

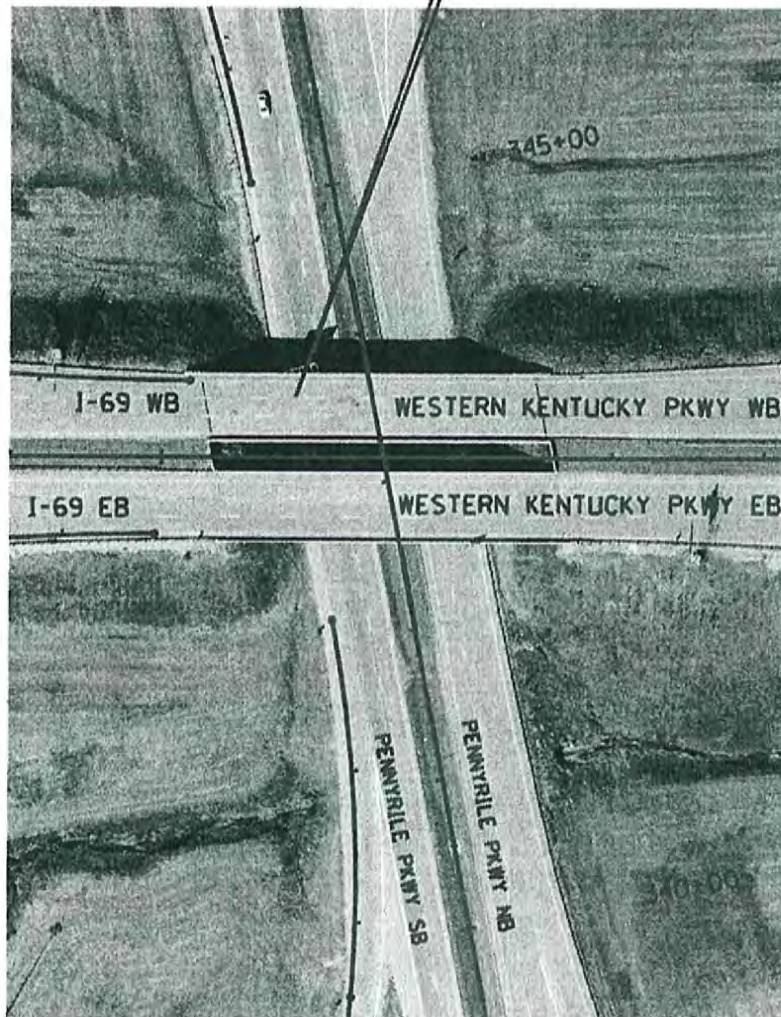
D. Approach Pavement Repair. The Contractor shall repair any damage to the approach pavement due to the construction. A new asphalt surface wedge for all approaches to each structure in this project shall be placed and compacted to the satisfaction of the Engineer prior to allowing traffic back on a section of bridge deck overlay. No additional payment will be allowed for this work, as it will be considered incidental to the pay item "ELIMINATE EXPANSION JOINT".

IV. MEASUREMENT. See Section 606.

V. PAYMENT. See Section 606.

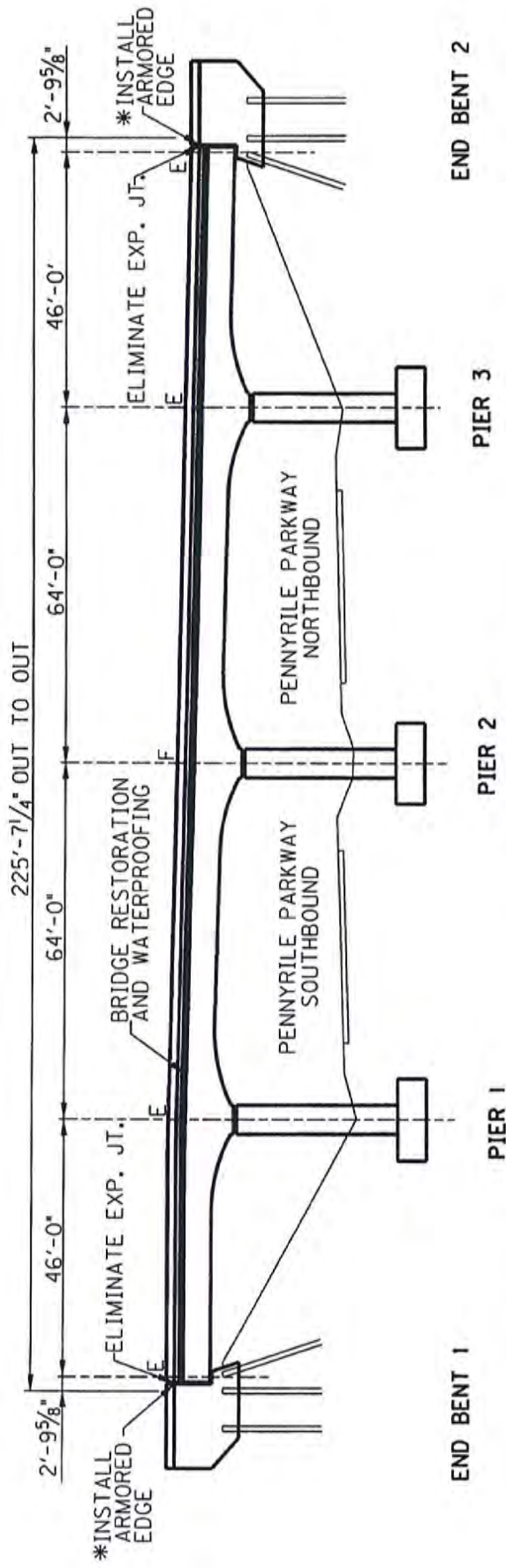
HOPKINS COUNTY

BRIDGE NO. 054B00145L
WESTERN KENTUCKY PARKWAY OVER
PENNYRILE PARKWAY



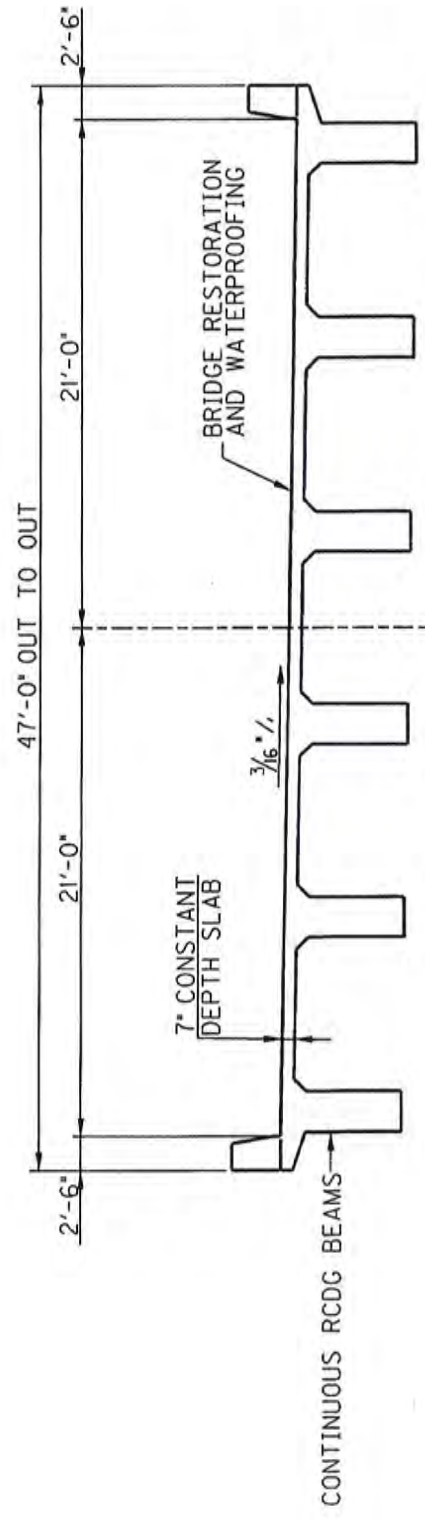
Approximate Location Information
Latitude: $37^{\circ}12'45''$
Longitude: $87^{\circ}26'29''$
MP 38.326 (WESTERN KENTUCKY PARKWAY)
MP 106.410 (I-69)

**WESTERN KENTUCKY PARKWAY OVER PENNYRILE PARKWAY
BRIDGE MAINTENANCE NUMBER 054B00145L**



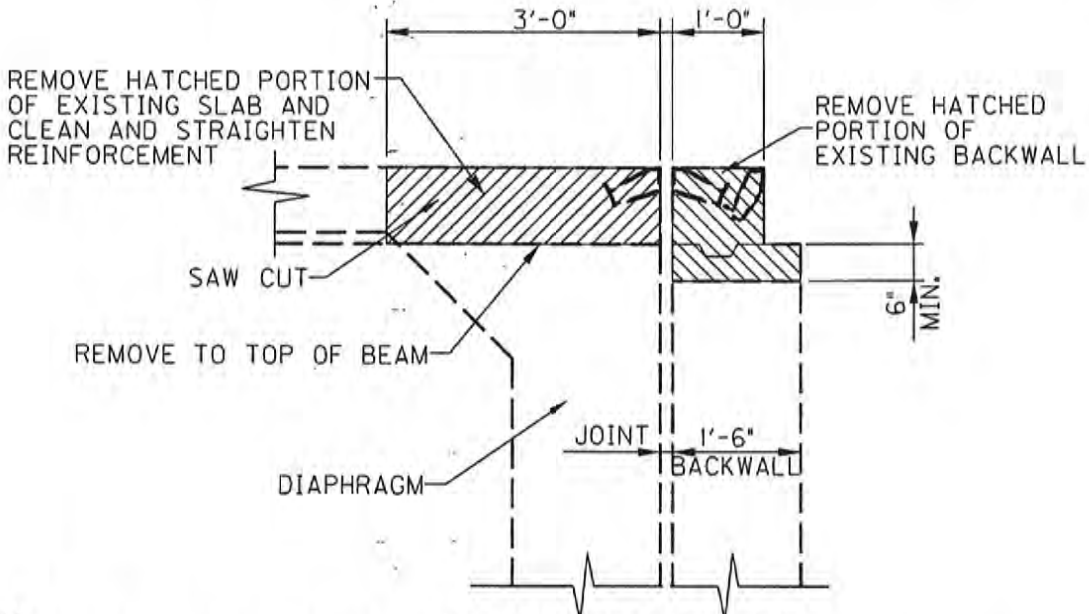
ELEVATION
10° 49' 10" SKEW L.T.
NOT TO SCALE

*SEE STD. DRWG. BJE-001-11



TYPICAL SECTION

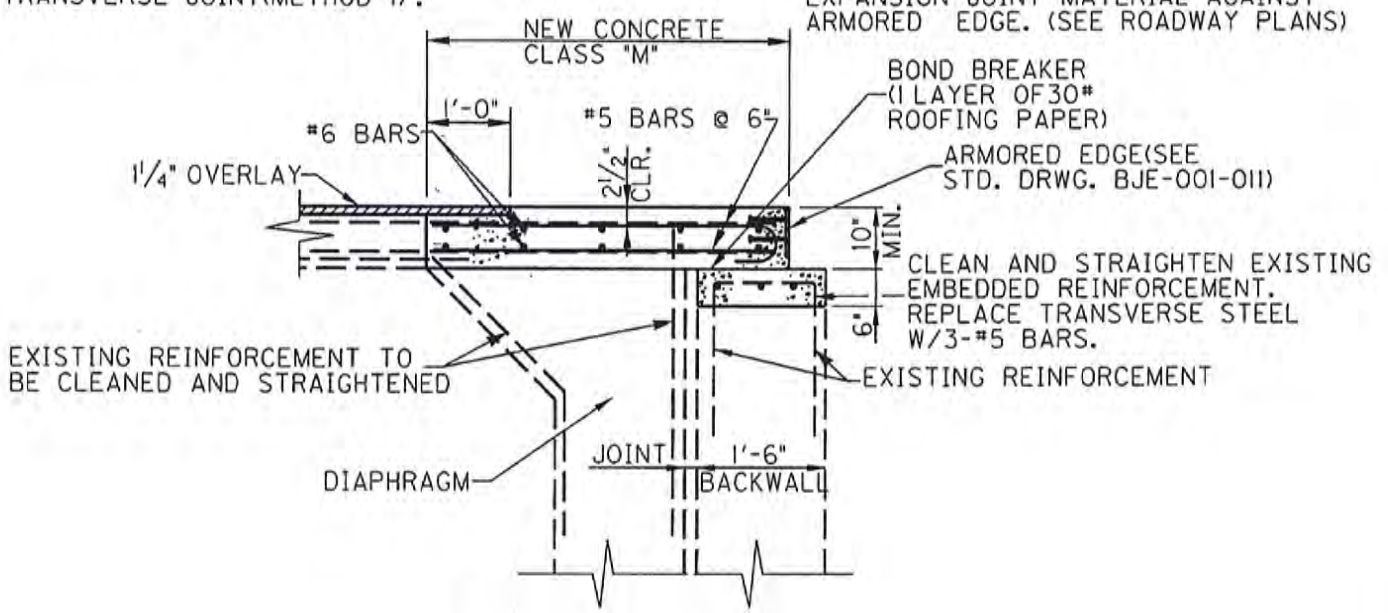
ELIMINATE JOINT @ END BENTS



**EXISTING SECTION
@ END BENT**

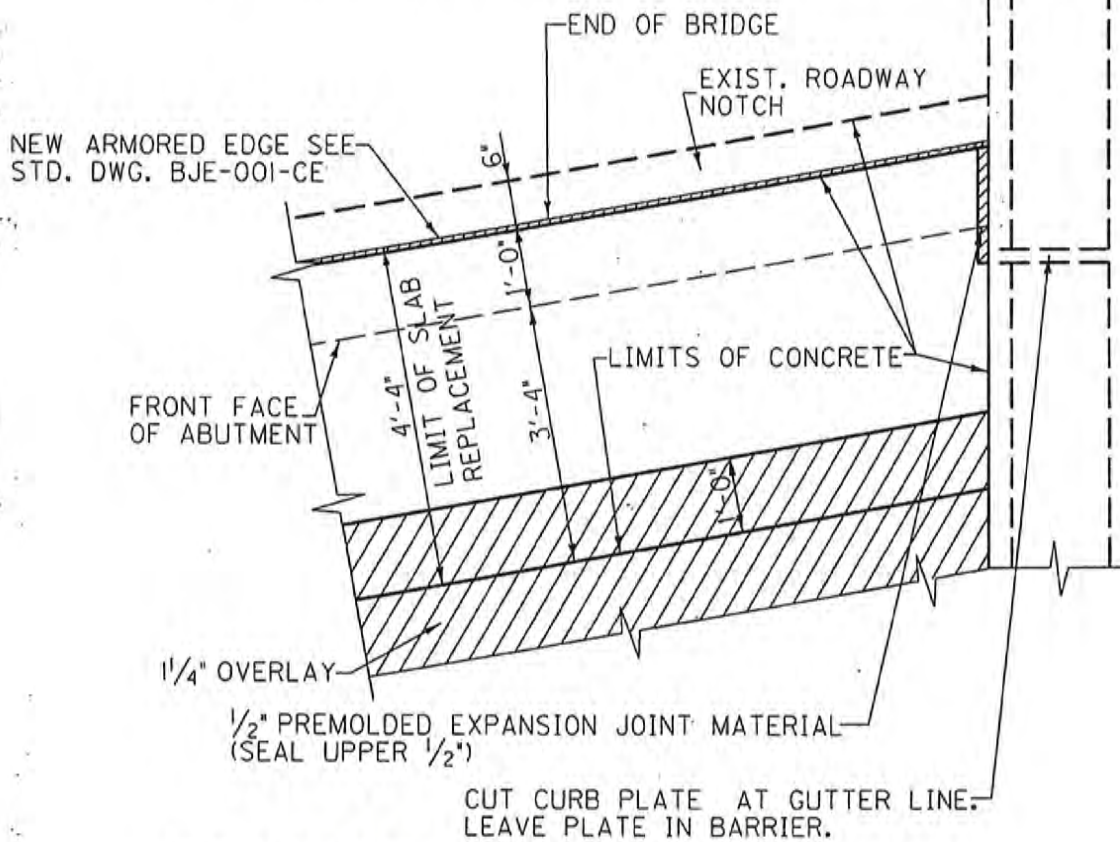
NOTE:
WHERE A NORMAL LAP CANNOT BE ATTAINED ON REBARS USE MECHANICAL SPLICES. SPLICES ARE INCIDENTAL TO "ELIMINATE TRANSVERSE JOINT (METHOD 1)".

NOTE:
REMOVE 6' MAXIMUM OF ROADWAY PAVEMENT, PLACE 1/2" PREMOLDED EXPANSION JOINT MATERIAL AGAINST ARMORED EDGE. (SEE ROADWAY PLANS)

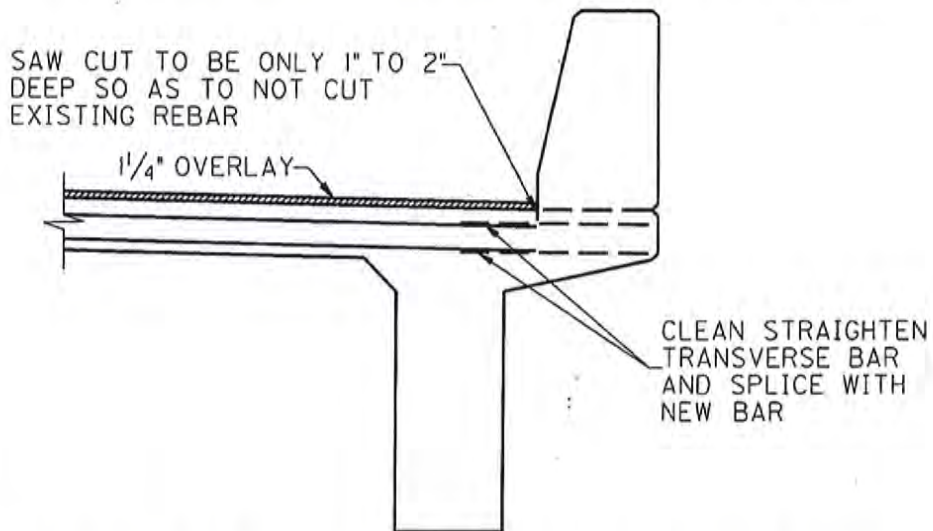


**PROPOSED SECTION
@ END BENT**

CURB SECTION @ END BENT

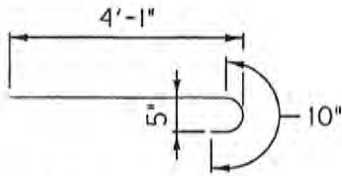


PROPOSED PLAN @ END BENT

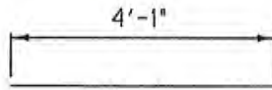


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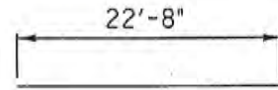
STEEL REINFORCEMENT



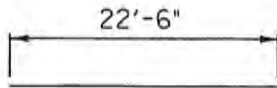
#5 BENT BAR
84 REQ'D EACH END BENT



#5 STRAIGHT BAR
84 REQ'D EACH END BENT



#6 STRAIGHT BAR
20 REQ'D EACH END BENT



#5 STRAIGHT BAR
6 REQ'D EACH END BENT

1,592 LBS EACH END BENT

END BENT REINFORCEMENT

300 LIN. FT. #4 BARS IN 20'-0" LENGTHS
200 LBS. EACH END BENT

MISCELLANEOUS REINFORCEMENT

TOTAL REINFORCEMENT 3,584 LBS.

NOTE: FURNISHING AND INSTALLING STEEL REINFORCEMENT
IS INCIDENTAL TO "ELIMINATE TRANSVERSE JOINT".

APPENDIX E

**SPECIFICATION FOR REMOVAL OF IMPROVEMENTS
(CLEARANCE OF RIGHT OF WAY)**

SCOPE OF WORK/DESCRIPTION

Work shall consist of the removal and the proper disposal of buildings, fences, septic tanks, driveways, paved areas, conduits, and other miscellaneous structures and encumbrances which exist upon or within the right of way and/or easements areas on the designated parcels. All work shall be in accordance with these specifications and any special provisions that may be included as a part of the contract.

GENERAL PROVISIONS

After award of contract, the DBT will be notified by the district to advise of any change in the probable date that the improvements will be available. The DBT shall not begin work until he has had all utilities disconnected by the utility companies involved.

The DBT agrees to indemnify and hold the KYTC harmless for any fines or penalties assessed to the KYTC as a direct result of the DBT's actions or omissions.

The DBT shall provide for adequate protection to safeguard the public at all times. He shall employ watchmen when necessary, and shall furnish and maintain barricades, lanterns or flares, and other devices considered necessary for the protection of the public.

If a street or road is to be closed or obstructed during the clearance of improvements a permit shall be secured by the DBT from the proper authority. The Transportation Cabinet, Fire Department, Police Department, and utility companies involved shall be given notice by the DBT of the time when such street or road is to be closed or obstructed.

The DBT shall use every precaution to prevent any damage to adjacent property and buildings. All equipment, tools, and materials permitted to remain on the right of way during the operations shall be neatly stored in such a manner as will not interfere with the rights and privileges of the adjacent property owners.

The DBT shall use every precaution to prevent damage to building walls which are jointly owned and are required to remain in place and shall assume full responsibility for any damage to an adjoining building resulting from his work or carelessness. All such wall structures shall be left sound and with an acceptable appearance. The DBT shall save the Commonwealth and the KYTC or any of its officers or agents harmless from damages or claims from his operations on a common or adjacent wall of a structure that is to remain in place.

All property line walls owned jointly with an adjacent property owner shall remain the property of the Commonwealth and the adjacent property owner, and shall remain in place unless otherwise specified in the contract.

All material from the clearance of improvements will become the property of the DBT, unless otherwise specified in the contract. The DBT (*at his own expense*) shall remove from the site and dispose of all materials in the manner set forth in Disposal of Materials Section of this specification.

The KYTC will not be responsible for plumbing fixtures, electrical fixtures, fences, storm doors, storm windows, or any other items of value left on the property.

SEEDING REQUIREMENTS FOR ALL DISTURBED AREAS

All areas that are disturbed as a result of the removal of the improvements and filling of basements or other open holes, to include borrow pits, upon completion of work shall be leveled and/or graded and have fertilizer, lime, grass seed and mulch applied as per standard specifications:

RODENT CONTROL

- Rodent control measures are not required on this contract.
- Rodent control measures are required on this contract and will be the responsibility of the successful bidder. The approved DBT must subcontract with a licensed exterminator for necessary rodent control measures **PRIOR** to beginning removal activities. The cost of this service shall be considered and included in the contract price. Satisfactory completion of rodent control measures must be documented by submission of a paid receipt from the licensed exterminator performing the work. The successful bidder will be allowed ten (10) calendar days after award of the contract to complete necessary rodent control measures. (NOTE: failure to submit paid receipt referenced herein will result in a penalty of \$200.00.)

DISPOSAL OF MATERIALS

Debris, Trash and Waste Materials – No debris, trash or waste material is to be buried on site. All debris, trash and waste material resulting from the removal of improvements shall be disposed of at a site or facility for which a permit for waste disposal has been issued by the Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Waste Management (excluding any material which is recovered for salvage/reuse including brick, concrete or blacktop which is to be disposed of as beneficial reuse). The cost of this disposal shall be considered and included in the contract price. Upon completion of the contract, the DBT will furnish the KYTC Project Manager with the name and address of the waste disposal site used and copies of the disposal receipts indicating the amount of material disposed.

Materials Requiring Special Disposal - It shall be the responsibility of the DBT to properly dispose of any hazardous waste, paint, tires, automobile batteries, etc. in a manner that meets all local, state and federal regulations regarding this type of disposal.

The cost of this disposal shall be considered and included in the contract price. Upon completion of the contract, the DBT will furnish the KYTC Project Manager with the name and address of the disposal site used and copies of the disposal receipts indicating the type and amount of material disposed.

HAZARDOUS MATERIALS-In the event the DBT unexpectedly encounters on the site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB) or other classified hazardous substances/materials which have not been rendered harmless, the DBT shall immediately stop work in the area affected and report the condition to the owner. The work in the affected area shall not thereafter be resumed except by written agreement of the owner and DBT if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other classified hazardous substances/materials which have not been rendered harmless. The work in the affected area shall be resumed in the absence of any classified hazardous substances/materials or when it or they have been rendered harmless.

RECOVERY OF REFRIGERANT

When a refrigeration unit (central air conditioners, freezer units, coolers, etc) is to be removed intact from the site for reuse, evacuation/recovery of refrigerant is not required. All refrigerant must be completely evacuated/recovered from any refrigeration unit which is not to be removed intact from the site or is to be removed for disposal. Evacuation/recovery is to take place prior to destruction of the unit. This evacuation/recovery must be performed by a licensed HVAC operator and documented by the submission, to the KYTC Project Manager, of a paid receipt from the licensed HVAC operator who performed the reclamation. **(NOTE: failure to submit paid receipt referenced herein will result in a penalty of \$200.00 per occurrence)** The cost of refrigerant evacuation/recovery shall be considered and be included in the contract price.

OPEN BURNING

In compliance with “401 KAR 63:005. Open Burning”, no open burning of improvements, trash, debris or waste material will be permitted.. The referenced KAR may be viewed on the Kentucky Legislation website <http://www.lrc.ky.gov/kar/401/063/005.htm>

Should open burning by unknown parties take place, the DBT shall immediately notify the KYTC Project Manager, the appropriate regional office of the Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division for Air Quality and local law enforcement authorities. A written report of these notifications is to be submitted to the KYTC Project Manager within 5 working days of the discovery of the burning.

CLEARANCE PROCEDURES

The removal of improvements is subject to all applicable statutes and regulations of federal, state, county and city governmental agencies, and in addition all work performed must strictly comply with the Specification for Removal of Improvements (TC 62-16).

DBT is cautioned against incorporating any changes in these specifications without approval of the KYTC Project Manager. Any unapproved changes will not be recognized for payment by the Owner. At no time will the KYTC be responsible for vandalism to improvements.

The DBT shall not use any state owned equipment nor state personnel on this project during the terms of this Contract.

The DBT shall have all existing utility services disconnected at the meter or at the service cutoff valves by the proper utility company. Water lines shall be removed to the service meters, and gas lines shall be removed to the service cutoff valves. Sewer lines shall be removed to the main line or to a depth well below the elevation of the proposed construction, and the remaining opening shall be closed with a masonry plug equal to the diameter of the pipe.

Buildings shall be removed and/or demolished in conformity with the best practices of the trade and in compliance with all ordinances and regulations pertaining to such work.

The DBT shall proceed to remove improvements on a street-by-street basis in an orderly fashion. Once removal activities have begun on an improvement, the debris must be promptly removed and all other contract specifications completely finished within a reasonable time at the discretion of the Right of Way Supervisor.

The DBT shall (*at his own expense and in a manner satisfactory to the KYTC*) sprinkle water on the debris as the work is being accomplished to eliminate dust from invading the surrounding neighborhood.

The DBT shall keep sidewalks and streets clean and (*if necessary*) repaired so as to not become a hazard to the public.

Walks, driveways, and paved areas shall be removed to the limits of the property lines or to the pavement edges of roads, streets or alleys.

Cisterns, cesspools, septic tanks and similar installations shall be emptied and the walls removed and/or broken up to a depth sufficient for proper filling as specified below, except when provided in the proposal for complete removal. Cesspools, septic tanks and similar installations are to be pumped by a licensed septic tank service prior to removal and documented by the submission of a paid receipt from the service that performed the pumping. **(NOTE: failure to submit paid receipt referenced herein will result in a penalty of \$200.00 per occurrence)** The cost of pumping shall be considered and included in the contract price.

Basements shall be cleared of all debris, appliances, partition walls, wooden floors, and other items. Concrete basement floors, basement walls and foundation walls shall be completely removed.

All open basements and other holes resulting from the removal of existing buildings, septic tanks, cisterns, or other structures (*after being cleared to a shovel clean condition*) shall be filled with stone, sand, or suitable earth compacted in layers to obtain a suitable field density unless otherwise specified in the description of parcels. No direct payment will be allowed for this work.

Prior to filling all open basements and other holes resulting from the removal of existing buildings, septic tanks, cisterns, or other structures, the DBT shall notify the KYTC Project Manager of the time he will begin to fill the hole(s). This notice shall be at least twenty-four (24) hours in advance to allow the KYTC Project Manager to have an inspector present prior to and during the work. Basements and other open holes resulting from the removal of existing buildings, septic tanks, cisterns, or other structures shall not be filled on weekends, or holidays without special advance authorization.

Failure to notify the KYTC Project Manager prior to filling any basement or open hole may result in the DBT being required to remove all material from the hole for an inspection of the material used. This removal and refilling shall be at the expense of the DBT. All sites need to be graded to existing ground level unless otherwise specified in the description of parcels.

STRUCTURES

If structures are moved on, over, or across public right-of-way as part of this contract, vendor shall complete a House Moving Application (TC 95-310) and submit said application to Kentucky Transportation Cabinet, Department of Vehicle Regulations, Division of Motor Carriers. Structures shall not be moved until such time the House Moving Application is approved and a permit issued by the KYTC. Vendor shall submit a copy of the approved permit to the KYTC Project Manager for each house moved as part of this contract. **(NOTE: Failure to provide said permit(s) will result in a \$250.00 penalty per occurrence.)**

DRILLED OR DUG WATER WELLS AND MONITORING WELLS SHALL NOT BE FILLED - It shall be the responsibility of the DBT to see that no debris or foreign material falls into any water well or monitoring well during the removal of buildings or other items, and each well must be temporarily covered. No direct payment will be allowed for this work.

CLEANUP-The DBT shall at all times keep the project premises and surrounding area free from the

accumulation of waste materials or rubbish caused by his operations in connection with the project. Upon completion of the work, and prior to final inspection and acceptance, the DBT shall remove all remaining waste materials, rubbish, DBT's construction equipment, tools, machinery and surplus materials and leave the project (including but not limited to glass, hardware, fixtures, masonry, tile and marble) in a clean and usable condition satisfactory to the owner. If the DBT fails to clean up as provided in the contract documents, the owner may perform the cleaning tasks and charge the cost to the DBT.

SAFETY OF PERSONS AND PROPERTY

The DBT shall continuously maintain adequate protection of all work from damage and shall protect the owner's property from injury or loss arising in connection with this contract. He shall make good any such damage, injury, or loss, except such as may be directly due to errors in the specifications or caused by agents or employees of the owner. The DBT shall adequately protect adjacent property as provided by law and the contract.

The DBT shall take all necessary precautions for the safety of employees on the work site, and shall comply with all applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the work is being performed.

PENALTIES

If penalties are assessed as a result of the DBT's failure to perform to the specifications of this contract, penalties shall be deducted from the amount of the contract. If penalties exceed the amount of the contract the vendor shall be required to reimburse KYTC for all penalties incurred. Vendor shall be responsible for any penalties incurred by Sub-DBTs providing services for vendor. If outstanding penalties are owed by the vendor, future bids of vendor shall be rejected as non-responsible until such times all penalties are paid in full.

INDEMNIFICATION

The DBT shall indemnify and hold the owner harmless from any and all claims, liability, damage, loss cost and expense of every type whatsoever including, without limitation, attorneys' fees and expenses, in connection with the DBT's performance of this contract, provided that such claims, liability, damage, loss, cost or expense is due to sickness, personal injury, disease or death, or to loss or destruction of tangible property (other than the work itself), including loss of use resulting there from, to the extent caused by the DBT, or anyone for whose acts the DBT may be liable, regardless of whether such liability, claim, damage, loss, cost or expense is caused in part by the owner.

APPENDIX F

APPENDIX G

R-042-2013
cc: S. Sewell
J. Rudd
K. McClearn
B. Houck
L. Hammer
D. Martin

MEMORANDUM

TO: Gary Valentine, P.E.
State Highway Engineers Office

FROM: Bart Asher, P.E., P.L.S.
Geotechnical Branch Manager

BY: Jason Wright
Geotechnical Branch

DATE: August 29, 2013

SUBJECT: Hopkins County
Improve ramp configuration at the existing I-69/Western Kentucky
Parkway/Pennyrile Parkway Interchange (I-69 corridor Improvement)
Item # 2-225
Mars # 8682501D
Geotechnical Data Report

This memorandum contains the data collected at the project site. DBTs are responsible for reviewing and analyzing the geotechnical information provided with the RFP. Soil and groundwater conditions are only known at the exploration locations at the time of the explorations. Bedrock data is only known at the locations of rock cores obtained at boring locations. Interpretation and interpolation between exploration locations shall be at the sole risk of the DBT. It is the DBT's responsibility to make interpretations and draw conclusions with respect to the character of the geotechnical materials encountered and their impact upon its work.

Drilling was completed by Stantec Consulting Services. The Kentucky Transportation Cabinet's Geotechnical Branch logged and completed testing of the rock core samples and the soil samples. The Geotechnical Branch has retained the rock cores and the pavement cores for viewing by the Design Build Teams. Testing for Bag #'s 4 and 6 (Holes #7 and #19) were not performed due to no samples.

Attachments:

Site Map

Site Investigation (Boring) Plan

Drillers Logs

Geologist Logs

Subsurface Profile Logs

Rock Testing Results

Soil Testing Results

Boring Location Coordinate Data

Hopkins County

I-69

Item No. 02-0225.00

Mars No. 8682501D

Design Build for Interchange
I-69 and Pennyrile Parkway



Legend

- Interstates
- Parkways
- US Highways
- State Roads
- Local Roads



0 625 1,250 2,500 Feet

USDA, NAIP, FSA, DGI

MEMORANDUM**R-042-2013**

**TO: Gary Valentine
I-69 Coordinator
District 4, Elizabethtown**

**FROM: Bart Asher, P.E.
Geotechnical Engineering
Branch Manager
Geotechnical Branch**

**BY: Jason Wright
Michael Blevins P.G.**

DATE: June 24, 2013

**SUBJECT: Hopkins County
OOOIM0021034; FD52 054 0069 106-107 D
I-69 Interchange @ Pennyrile Parkway
Item No. 2-225.00
Mars# 8682501D
Subsurface Exploration Plan**

The following borings are to be staked and marked showing station, offset, existing groundline elevation, and hole number. Palmer Engineering will be responsible for staking all of the boring locations. A copy of the survey notes is to be sent to the Geotechnical Branch after completion of the staking. The survey notes will include latitude and longitude, in decimal degrees, for each hole location. Palmer may need to recalculate new coordinates for holes moved during staking. All drilling and sampling shall be in accordance with the current KYTC geotechnical manual, Section GT-300.

I. ROCK CORES: Rock cores will be drilled at the following locations by drilling through the overburden to the top of bedded rock and coring to the specified elevation.

NOTE : If the overburden depth in the core hole exceeds ten (10) feet, a soil boring will be drilled a minimum of 25 feet away or a distance corresponding to twice the overburden depth in the core hole, whichever is the maximum distance. The soil boring will be drilled on the uphill side of the cut, perpendicular to and away from centerline. Thin-wall tube samples and/or SPTs, as applicable, will be obtained in each five (5) foot interval starting at 2 to 3 feet below the groundline to the top of bedded material or to twenty (20) feet below the proposed ditchline, whichever occurs first. If the overburden depth in the undisturbed soil boring exceeds ten (10) feet an observation well will be installed. An immediate water table reading shall be performed and another no sooner than seven (7) days after completion of the boring. Water table readings shall be recorded on the subsurface log.

A. Cut limits from Mainline Sta. 1031+00 to Sta. 1040+00

Hole # 1 Sta. 1037+00 70' Lt
Auger and core to elevation 450.0

B. Cut limits from Mainline Sta. 1053+00 to Sta. 1066+00

Hole #2 Sta. 1058+00 80' Rt
Auger and core to elevation 435.0

Hole #3 Sta. 1064+00 80' Rt
Auger and core to elevation 433.0

C. Cut limits from Mainline Sta. 1100+00 to Sta. 1105+00

Hole #4 Sta. 1102+00 105' Rt
Auger and core to elevation 445.0

D. Cut limits from Ramp J Sta. 5003+00 to Sta. 5012+00

Hole #5 Sta. 5008+00 20' Rt
Auger and core to elevation 450.0

E. Cut limits from Ramp L Sta. 9608+00 to Sta. 9614+00

Hole #6 Sta. 9612+00 20' Rt
Auger and core to elevation 420.0

II. DISTURBED SOIL BORINGS: Disturbed Soil Borings will be performed at the following locations and accompanying depths. A representative bag sample of 30 pounds shall be obtained from each soil horizon per 1,000 linear feet of roadway. Obtain a moisture jar sample from each 5-foot interval.

| <u>Hole No.</u> | <u>Station</u> | <u>Offset</u> | <u>Depth</u> | <u>C/F</u> |
|------------------|----------------|---------------|--------------|------------|
| Mainline: | | | | |
| 7 | 1033+00 | 80' Lt | 20' | C |
| 8 | 1036+00 | 75' Lt | 30' | C |
| 9 | 1039+00 | 80' Lt | 30' | C |
| 10 | 1042+00 | CL | 15' | C |
| 11 | 1044+00 | 70' Lt | 15' | C |
| 12 | 1050+00 | 60' Rt | 10' | C |
| 13 | 1055+00 | CL | 20' | C |
| 14 | 1058+00 | CL | 40' | C |
| 15 | 1061+00 | 80' Lt | 20' | C |

| | | | | |
|----|---------|---------|-----|---|
| 16 | 1065+00 | 80' Rt | 35' | C |
| 17 | 1079+00 | 80' Rt | 5' | C |
| 18 | 1084+00 | 100' Rt | 10' | C |
| 19 | 1091+00 | 90' Lt | 5' | C |

Ramp K:

| | | | | |
|----|---------|--------|-----|---|
| 20 | 9411+00 | 60' Rt | 15' | C |
|----|---------|--------|-----|---|

III. PAVEMENT & SUBGRADE UNDISTURBED BORINGS : Auger through the pavement and dense-graded aggregate and obtain an intact core and a Shelby Tube Sample starting directly below the DGA. **Pavement and DGA thickness should be noted in the boring log.** (If a Shelby Tube Sample cannot be obtained due to the soil type, a disturbed bag sample may be obtained.) Traffic control with certified flaggers will be required to obtain these borings. When the borings are backfilled, the refill material should be tamped as much as possible. After the holes are backfilled, the Driller should contact District 2 Maintenance to request patching of the holes with cold-mix asphalt.

| Hole No. | Station | Offset |
|------------------|---------|-----------------------|
| Mainline: | | |
| 21 | 1010+00 | 35' Lt (Driving Lane) |
| 22 | 1010+00 | 47' Lt.(Shoulder) |
| 23 | 1030+00 | 35' Rt (Driving Lane) |
| 24 | 1030+00 | 47' Rt (Shoulder) |
| 25 | 1078+00 | 38' Rt (Driving Lane) |
| 26 | 1078+00 | 50' Rt (Shoulder) |
| 27 | 1095+00 | 38' Lt (Driving Lane) |
| 28 | 1095+00 | 50' Lt (Shoulder) |

IV. BRIDGE HOLES: Obtain thin walled tube samples. Standard penetration test samples may be obtained only if soil is not conducive to tube sampling. Obtain samples at 5 ft intervals to the top of the bedded material and obtain a minimum 20 ft core. The driller shall contact this office to set up additional coring depth if poor recovery or poor rock is encountered. Also, if voids are encountered contact this office to setup additional cores.

| Hole No. | Station | Offset |
|----------------|---------|--------|
| Ramp L: | | |
| 1001 | 9620+25 | 12' Lt |
| 1002 | 9622+50 | 12' Lt |
| 1003 | 9624+50 | 12' Lt |

Ramp M:

| | | | |
|------|---------|--------|--|
| 1004 | 9213+50 | 12' Lt | Core to elev. 430' w/min. of 20' core |
| 1005 | 9215+25 | 12' Lt | Core to elev. 430' w/min. of 20' core |
| 1006 | 9217+25 | 12' Lt | Core to elev. 430' w/min. of 20' core |

DRILLER'S SUBSURFACE LOG

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | | |
|--------------------------------------|-------|--|------------|---------------------------------|------------|------------------------------|-----------|-----------------------------|---------|------------------------------------|--|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | | | |
| | | <u>Hopkins - I-0069</u> | | Project ID: <u>R-042-2013</u> | | Project Type: <u>Roadway</u> | | Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>1</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/18/2013</u> | | Hole Type <u>core</u> | | | | | |
| Surface Elevation <u>476.6'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/18/2013</u> | | Rig Number <u> </u> | | | | | |
| Total Depth <u>28.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212849</u> | | | | | | | |
| Location <u>1037+00.00 70.0' Lt.</u> | | | | Longitude(83) <u>-87.450400</u> | | | | | | | |
| 476.4 | 0.2 | Topsoil. | | | | | | | | | |
| 5 471.6 | 5.0 | Stiff, brown, silty lean clay. (Begin Core) | | 1 | 3.0-5.0 | 1.6 | | ST | 5 | | |
| 10 464.7 | 11.9 | Gray shale, (soft to moderately hard, highly weathered, earthy). | | 0 / 0 | 3.0 | 2.6 | 87 | | 8.0 | | |
| 15 460.6 | 16.0 | Red-brown shale, (soft, highly weathered). | | 26 / 0 | 5.0 | 4.9 | 98 | | 10 | | |
| 20 | | Light gray shale, (moderately soft, fissile). | | 27 / 0 | 5.0 | 5.0 | 100 | | 13.0 | | |
| 25 | | | | 90 / 0 | 5.0 | 5.0 | 100 | | 15 | | |
| 30 448.6 | 28.0 | (Bottom of Hole 28.0') | | 90 / 0 | 5.0 | 5.0 | 100 | | 18.0 | | |
| 35 | | | | | | | | | 20 | | |
| 40 | | | | | | | | | 23.0 | | |
| 45 | | | | | | | | | 25 | | |
| 50 | | | | | | | | | 28.0 | | |

DRILLER'S SUBSURFACE LOG

| | | |
|---|-------------------------|--|
| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> |
|---|-------------------------|--|

| | | | |
|---|--|--|---|
| Hole Number <u>2</u> Surface Elevation <u>484.5'</u> Total Depth <u>50.0'</u> Location <u>1058+80.00 80.0' Rt.</u> | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> | Start Date <u>07/17/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.215634</u> Longitude(83) <u>-87.444277</u> | Hole Type <u>core</u> Rig_Number <u> </u> |
|---|--|--|---|

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|------------------------|------------|------------|------------|-----------|-----------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 55 | | (Bottom of Hole 50.0') | | | | | | | 55 |
| 60 | | | | | | | | | 60 |
| 65 | | | | | | | | | 65 |
| 70 | | | | | | | | | 70 |
| 75 | | | | | | | | | 75 |
| 80 | | | | | | | | | 80 |
| 85 | | | | | | | | | 85 |
| 90 | | | | | | | | | 90 |
| 95 | | | | | | | | | 95 |
| 100 | | | | | | | | | 100 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---|--|---------------------------------|------------|------------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>3</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/16/2013</u> | | Hole Type <u>core</u> | | | |
| Surface Elevation <u>465.4'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/16/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>33.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.217148</u> | | | | | |
| Location <u>1064+00.00 40.0' Rt.</u> | | | | Longitude(83) <u>-87.443325</u> | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | |
| | | Stiff, brown, silty lean clay. | | | | | | | |
| 5 | | | | | | | | | 5 |
| 456.4 | 9.0 | (Begin Core) | | | | | | | |
| 10 | | | | | | | | | 10 |
| | | | | 0 / 0 | 4.0 | 4.0 | 100 | | 13.0 |
| 15 | | | | | | | | | 15 |
| | | Brown to gray shale, weathered, (soft). | | 0 / 0 | 5.0 | 5.0 | 100 | | 18.0 |
| 20 | | | | | | | | | 20 |
| 442.8 | 22.6 | | | 0 / 0 | 5.0 | 5.0 | 100 | | 23.0 |
| 25 | | | | | | | | | 25 |
| | | Gray shale, (moderately hard, fissile). | | 0 / 0 | 5.0 | 5.0 | 100 | | 28.0 |
| 30 | | | | | | | | | 30 |
| 432.4 | 33.0 | | | 0 / 0 | 5.0 | 5.0 | 100 | | 33.0 |
| 35 | | | | | | | | | 35 |
| | | (Bottom of Hole 33.0') | | | | | | | |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---|------------|---------------------------------|------------------------------------|-----------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>6</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/23/2013</u> | | Hole Type <u>core</u> | | |
| Surface Elevation <u>434.1'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/23/2013</u> | | Rig Number <u> </u> | | |
| Total Depth <u>15.4'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221067</u> | | | | |
| Location <u>9612+00.00 20.0' Rt.</u> | | | | Longitude(83) <u>-87.443931</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | | | | | | | |
| 5 | | Stiff, brown, silty lean clay. | | | | | | 5 |
| 425.1 | 9.0 | (Begin Core) | | | | | | |
| 10 | | Brown shale, weathered, (soft, earthy). | 0 / 0 | 3.0 | 3.0 | 100 | | 10 |
| 15 | 418.7 | | 0 / 0 | 3.4 | 3.4 | 100 | | 15 |
| | 15.4 | | | | | | | 15.4 |
| 20 | | (Bottom of Hole 15.4') | | | | | | 20 |
| 25 | | | | | | | | 25 |
| 30 | | | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---|------------|---------------------------------|------------------------------------|------------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>9</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/17/2013</u> | | Hole Type <u>cut profile</u> | | |
| Surface Elevation <u>477.9'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/17/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>10.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212991</u> | | | | |
| Location <u>1039+00.00 80.0' Lt.</u> | | | | Longitude(83) <u>-87.449756</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 477.9 | 0.0 | Topsoil. | | | | | | |
| 477.6 | 0.3 | Stiff, brown to gray-brown, silty clay with grades into highly weathered shale. | | | | | | |
| | | Stiff, brown, silty lean clay. | | | | | | |
| 469.5 | 8.4 | | | | | | | |
| | | (Bottom of Hole 10.0') (No Refusal) | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|---------------------------------|-------|---|------------|---------------------------------|------------------------------------|------------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>10</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/12/2013</u> | | Hole Type <u>cut profile</u> | | |
| Surface Elevation <u>466.3'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/12/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>12.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.213031</u> | | | | |
| Location <u>1042+00.00 CL</u> | | | | Longitude(83) <u>-87.448707</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 466.0 | 0.3 | Topsoil. | | | | | | |
| 5 | | Stiff, brown, silty lean clay. | | | | | | 5 |
| 457.3 | 9.0 | | | | | | | 10 |
| 10 | | Stiff, brown to gray-brown, silty clay with grades into highly weathered shale. | | | | | | 10 |
| 454.3 | 12.0 | | | | | | | 15 |
| 15 | | (Bottom of Hole 12.0') (No Refusal) | | | | | | 15 |
| 20 | | | | | | | | 20 |
| 25 | | | | | | | | 25 |
| 30 | | | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| | | | |
|--------------------------------------|---------------------------------|------------------------------------|------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>12</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/18/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>438.0'</u> | Static Water Depth <u>NA</u> | End Date <u>07/18/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>10.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.214003</u> | |
| Location <u>1050+00.00 60.0' Rt.</u> | | Longitude(83) <u>-87.446211</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|--|------------|------------|------------|-----------|-----------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 5 | | Stiff, brown, silty lean clay. | | | | | | | 5 |
| 10 | 428.0 | | 10.0 | | | | | | 10 |
| 15 | | (Bottom of Hole 10.0') (No Refusal) | | | | | | | 15 |
| 20 | | | | | | | | | 20 |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|---------------------------------|-------|---------------------------------|------------|---------------------------------|-----------|------------------------------------|-------------|---------|----|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>13</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/17/2013</u> | | Hole Type <u>cut profile</u> | | | |
| Surface Elevation <u>458.0'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/17/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>10.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.215097</u> | | | | | |
| Location <u>1055+00.00 CL</u> | | | | Longitude(83) <u>-87.445125</u> | | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | | |
| 5 | | | | | | | | | 5 |
| 449.5 | 8.5 | | | | | | | | |
| 10 | 448.0 | | | | | | | | 10 |
| | 10.0 | | | | | | | | |
| 15 | | | | | | | | | 15 |
| | | | | | | | | | |
| 20 | | | | | | | | | 20 |
| | | | | | | | | | |
| 25 | | | | | | | | | 25 |
| | | | | | | | | | |
| 30 | | | | | | | | | 30 |
| | | | | | | | | | |
| 35 | | | | | | | | | 35 |
| | | | | | | | | | |
| 40 | | | | | | | | | 40 |
| | | | | | | | | | |
| 45 | | | | | | | | | 45 |
| | | | | | | | | | |
| 50 | | | | | | | | | 50 |
| | | | | | | | | | |

5
449.5
10
15
20
25
30
35
40
45
50

5
10
15
20
25
30
35
40
45
50

Stiff, brown, silty lean clay.

Stiff, brown to gray-brown, silty clay (grades in to highly weathered shale)

(Bottom of Hole 10.0')
(No Refusal)

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|------------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>17</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/17/2013</u> | | Hole Type <u>cut profile</u> | | |
| Surface Elevation <u>424.9'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/17/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>5.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221321</u> | | | | |
| Location <u>1079+00.00 80.0' Rt.</u> | | | | Longitude(83) <u>-87.443018</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 424.6 | 0.3 | Topsoil. | | | | | | |
| 5 419.9 | 5.0 | Stiff, brown, silty lean clay. | | | | | | 5 |
| | | Topsoil. | | | | | | |
| 10 | | (Bottom of Hole 5.0') (No Refusal) | | | | | | 10 |
| 15 | | | | | | | | 15 |
| 20 | | | | | | | | 20 |
| 25 | | | | | | | | 25 |
| 30 | | | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|---|-------|--|--|--|------------|---|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>19</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/17/2013</u> | | Hole Type <u>cut profile</u> | | | |
| Surface Elevation <u>420.4'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/17/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>5.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.224488</u> | | | | | |
| Location <u>1091+00.00 90.0' Lt.</u> | | | | Longitude(83) <u>-87.444319</u> | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | | Rock Core | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 419.8 | 0.6 | Topsoil. | | | | | | | |
| 5 415.4 | 5.0 | Stiff, brown, silty lean clay. | | | | | | | 5 |
| 10 | | (Bottom of Hole 5.0') (No Refusal) | | | | | | | 10 |
| 15 | | | | | | | | | 15 |
| 20 | | | | | | | | | 20 |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | | |
|---|-------|---|--|--|------------|---|-----------|-------------|---------|----|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>20</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/18/2013</u> | | Hole Type <u>cut profile</u> | | | | |
| Surface Elevation <u>428.7'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/18/2013</u> | | Rig_Number <u> </u> | | | | |
| Total Depth <u>15.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.219456</u> | | | | | | |
| Location <u>9411+00.00 60.0' Rt.</u> | | | | Longitude(83) <u>-87.442567</u> | | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | |
| Elevation | Depth | Description | | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | | |
| 428.4 | 0.3 | Topsoil. | | | | | | | | |
| 5 | | Stiff, brown, silty lean clay. | | | | | | | 5 | |
| 10 | | | | | | | | | | 10 |
| 416.7 | 12.0 | | | | | | | | | |
| 15 | | Stiff, brown to gray-brown, silty clay (grades in to highly weathered shale). | | | | | | | 15 | |
| 413.7 | 15.0 | | | | | | | | | |
| 20 | | (Bottom of Hole 15.0') (No Refusal) | | | | | | | 20 | |
| 25 | | | | | | | | | | 25 |
| 30 | | | | | | | | | | 30 |
| 35 | | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 | |
| 45 | | | | | | | | | 45 | |
| 50 | | | | | | | | | 50 | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|--|---------------------------------|------------|------------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>21</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>439.1'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>4.3'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212728</u> | | | | | |
| Location <u>1010+00.00 35.0' Lt.</u> | | | | Longitude(83) <u>-87.459619</u> | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 438.6 | 0.5 | Asphalt (7") Core. | | | | | | | |
| 437.8 | 1.3 | Concrete (9") core. | | | | | | | |
| 436.8 | 2.3 | DGA. | | | | | | | |
| 434.8 | 4.3 | Stiff, brown, silty lean clay. | | 1 | 2.3-4.3 | 2.0 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-------------|---------|
| Item Number: <u>02-0225.</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>22</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | |
| Surface Elevation <u>438.8'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig Number <u> </u> | | |
| Total Depth <u>3.9'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212748</u> | | | | |
| Location <u>1010+00.00 47.0' Lt.</u> | | | | Longitude(83) <u>-87.459619</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 438.0 | 0.8 | Asphalt (10") Core. | | | | | | |
| 436.9 | 1.9 | DGA. | | | | | | |
| 434.9 | 3.9 | Stiff, brown, silty lean clay. | 1 | 1.9-3.9 | 2.0 | | ST | |
| 5 | | (Bottom of Hole 3.9') (No Refusal) | | | | | | 5 |
| 10 | | | | | | | | 10 |
| 15 | | | | | | | | 15 |
| 20 | | | | | | | | 20 |
| 25 | | | | | | | | 25 |
| 30 | | | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------|-------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | | | | | | |
| Hole Number <u>23</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | |
| Surface Elevation <u>437.3'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>4.3'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212448</u> | | | | |
| Location <u>1030+00.00 35.0' Rt.</u> | | | | Longitude(83) <u>-87.452754</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 436.5 | 0.8 | Asphalt (8") Core. | | | | | | |
| 435.8 | 1.5 | Concrete (9") Core. | | | | | | |
| 435.0 | 2.3 | DGA. | | | | | | |
| 433.0 | 4.3 | Stiff, brown, silty lean clay. | 1 | 2.3-4.3 | 2.0 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>24</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>457.0'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>3.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212428</u> | | | | | |
| Location <u>1030+00.00 47.0' Rt.</u> | | | | Longitude(83) <u>-87.452754</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 456.0 | 1.0 | Asphalt (12") Core. | | | | | | | |
| 455.0 | 2.0 | DGA. | | | | | | | |
| 454.0 | 3.0 | Stiff, brown, silty lean clay. | | 1 | 2.0-3.0 | 1.0 | | ST | |
| 5 | | (Bottom of Hole 3.0') (No Refusal) | | | | | | | 5 |
| 10 | | | | | | | | | 10 |
| 15 | | | | | | | | | 15 |
| 20 | | | | | | | | | 20 |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|---------------------------------------|--|---------------------------------|------------------------------------|-------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225.</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>25</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>431.4'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig Number <u> </u> | | | |
| Total Depth <u>4.7'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221034</u> | | | | | |
| Location <u>1078+00.00 38.0' Rt.</u> | | | | Longitude(83) <u>-87.443073</u> | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | | Rock Core | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 430.7 | 0.7 | Asphalt (8") Core. | | | | | | | |
| 429.9 | 1.5 | Concrete (9") Core. | | | | | | | |
| 428.7 | 2.7 | DGA. | | | | | | | |
| 426.7 | 4.7 | Stiff, brown, silty lean clay. | | 1 | 2.7-4.7 | 1.8 | | ST | |
| | | (Bottom of Hole 4.7') (No Refusal) | | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>26</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | |
| Surface Elevation <u>431.2'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>4.3'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221037</u> | | | | |
| Location <u>1078+00.00 50.0' Rt.</u> | | | | Longitude(83) <u>-87.443059</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 430.7 | 0.5 | Asphalt (6") Core. | | | | | | |
| 428.9 | 2.3 | DGA. | | | | | | |
| 426.9 | 4.3 | Stiff, brown, silty lean clay. | 1 | 2.3-4.3 | 1.5 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>27</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>440.0'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig Number <u> </u> | | | |
| Total Depth <u>4.5'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.225592</u> | | | | | |
| Location <u>1095+00.00 35.0' Lt.</u> | | | | Longitude(83) <u>-87.444401</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 439.2 | 0.8 | Asphalt (10") Core. | | | | | | | |
| 438.4 | 1.6 | Concrete (10") Core. | | | | | | | |
| 437.5 | 2.5 | DGA. | | | | | | | |
| 435.5 | 4.5 | Stiff, brown, silty lean clay. | | 1 | 2.5-4.5 | 2.0 | | ST | |
| | | (Bottom of Hole 4.5') (No Refusal) | | | | | | | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------|-------------------------|-------------|---------|----|
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | | | | | | | |
| Hole Number <u>28</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>439.5'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>4.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.225584</u> | | | | | |
| Location <u>1095+00.00 50.0' Lt.</u> | | | | Longitude(83) <u>-87.444426</u> | | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | | |
| 438.9 | 0.6 | Asphalt (7") Core. | | | | | | | |
| 437.5 | 2.0 | DGA. | | | | | | | |
| 435.5 | 4.0 | Stiff, brown, silty lean clay. | | 1 | 2.0-4.0 | 1.5 | ST | | |
| 5 | | (Bottom of Hole 4.0') (No Refusal) | | | | | | 5 | |
| 10 | | | | | | | | | 10 |
| 15 | | | | | | | | | 15 |
| 20 | | | | | | | | | 20 |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | 35 | |
| 40 | | | | | | | | 40 | |
| 45 | | | | | | | | 45 | |
| 50 | | | | | | | | 50 | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|--|--|---------------------------------|------------|------------------------------------|-----------|-------------|---------|----------|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>1001</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>core and sample</u> | | | | |
| Surface Elevation <u>434.5'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | | |
| Total Depth <u>28.5'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.218841</u> | | | | | | |
| Location <u>9620+25.00 12.0' Lt.</u> | | | | Longitude(83) <u>-87.443464</u> | | | | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | |
| Elevation | Depth | Description | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | | SDI (JS) |
| | | Stiff, brown, silty lean clay. | | | | | | | | |
| 5 | | | | 1 | 3.0-5.0 | 2.0 | | | ST | |
| 426.5 | 8.0 | (Begin Core) | | | | | | | | |
| 10 | | Brown to gray shale, weathered, (soft to moderately hard). | | 0 / 0 | 4.0 | 3.0 | 75 | | 12.0 | |
| 422.1 | 12.4 | | | | | | | | | |
| 15 | | Gray shale, (moderately hard). | | 68 / 0 | 5.0 | 5.0 | 100 | | 15 | |
| | | | | | | | | | | 17.0 |
| 20 | | | | 72 / 0 | 5.0 | 5.0 | 100 | | | 20 |
| | | | | | | | | | | 22.0 |
| 25 | | | | 76 / 0 | 5.0 | 5.0 | 100 | | 25 | |
| | | | | | | | | | 27.0 | |
| 406.0 | 28.5 | | | 80 / 0 | 1.5 | 1.5 | 100 | | 28.5 | |
| 30 | | (Bottom of Hole 28.5') | | | | | | | 30 | |
| 35 | | | | | | | | | 35 | |
| 40 | | | | | | | | | 40 | |
| 45 | | | | | | | | | 45 | |
| 50 | | | | | | | | | 50 | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---|------------|---------------------------------|------------|----------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | | | | | | | |
| Hole Number <u>1003</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/23/2013</u> | | Hole Type <u>core and sample</u> | | | |
| Surface Elevation <u>441.7'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/23/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>31.5'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.217733</u> | | | | | |
| Location <u>9624+50.00 12.0' Lt.</u> | | | | Longitude(83) <u>-87.442998</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | Stiff, brown, silty lean clay. | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 5 | | | | | | | | | 5 |
| 433.7 | 8.0 | | | | | | | | |
| | | Stiff, brown to gray-brown, silty clay (grades into highly weathered shale). (Begin Core) | | 2 | 8.0-9.5 | 1.5 | | ST | |
| 10 | 431.7 | | | | | | | | 10 |
| | | Brown to gray shale, weathered, (soft to moderately hard). | | 67 / 0 | 3.0 | 2.6 | 87 | | 13.0 |
| 15 | | | | | 76 / 0 | 5.0 | 5.0 | 100 | 15 |
| | | | | | 80 / 0 | 5.0 | 5.0 | 100 | 18.0 |
| 20 | | | | | 76 / 0 | 5.0 | 5.0 | 100 | 20 |
| | | | | | 76 / 0 | 5.0 | 5.0 | 100 | 23.0 |
| 25 | | | | | 43 / 0 | 3.5 | 3.5 | 100 | 25 |
| | | | | | | | | 28.0 | |
| 30 | 410.2 | | | | | | | 30 | |
| | | | | | | | | 31.5 | |
| | | (Bottom of Hole 31.5') | | | | | | | |
| 35 | | | | | | | | 35 | |
| | | | | | | | | 40 | |
| 40 | | | | | | | | 40 | |
| | | | | | | | | 45 | |
| 45 | | | | | | | | 45 | |
| | | | | | | | | 50 | |
| 50 | | | | | | | | 50 | |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------|--------------|---------------------------------|------------|------------------------------------|-------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>1004</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/16/2013</u> | | Hole Type <u>core and sample</u> | | | |
| Surface Elevation <u>467.2'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/17/2013</u> | | Rig Number <u> </u> | | | |
| Total Depth <u>38.5'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212966</u> | | | | | |
| Location <u>9213+50.00 12.0' Lt.</u> | | | | Longitude(83) <u>-87.448004</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | Stiff, brown, silty lean clay. | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 458.2 | 9.0 | | (Begin Core) | 1 | 8.0-9.0 | 1.0 | 15-50/0.50' | SPT | |
| | | | | 0 / 0 | 7.0 | 6.0 | 86 | | |
| | | Gray shale, weathered, (soft). | | 10 / 0 | 10.0 | 10.0 | 100 | | 16.0 |
| | | | | 14 / 0 | 10.0 | 10.0 | 100 | | 26.0 |
| 428.7 | 38.5 | | | 24 / 0 | 2.5 | 2.5 | 100 | | 36.0 |
| | | (Bottom of Hole 38.5') | | | | | | | 38.5 |

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | | |
|--|-------|--|--------------|--|--|---|-------------|-------------|---------|
| Hole Number <u>1006</u> Surface Elevation <u>473.6'</u> Total Depth <u>43.5'</u> Location <u>9217+25.00 12.0' Lt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> | | Start Date <u>07/17/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.213125</u> Longitude(83) <u>-87.449278</u> | | Hole Type <u>core and sample</u> Rig_Number <u> </u> | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | Stiff, brown, silty lean clay. | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 464.7 | 8.9 | | (Begin Core) | 1 | 8.0-8.9 | 0.8 | 10-50/0.40' | SPT | |
| | | Gray shale, weathered, (soft, fissile). | | 23 / 0 | 8.1 | 7.6 | 94 | | 17.0 |
| | | | | 22 / 0 | 10.0 | 10.0 | 100 | | 27.0 |
| | | | | 35 / 0 | 10.0 | 10.0 | 100 | | 37.0 |
| | | | | 36 / 0 | 6.5 | 6.5 | 100 | | |
| 430.1 | 43.5 | | | | | | | | 43.5 |
| | | (Bottom of Hole 43.5') | | | | | | | |

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | | |
|---|-------|--|---|--|--|---|-----------|--------------|---------|
| Hole Number <u>1</u> Surface Elevation <u>476.6'</u> Total Depth <u>28.0'</u> Location <u>1037+00.00 70.0' Lt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u>Brad Williams</u> | | Start Date <u>07/18/2013</u> End Date <u>07/18/2013</u> Latitude(83) <u>37.212849</u> Longitude(83) <u>-87.450400</u> | | Hole Type <u>core</u> Rig Number <u> </u> <u>GQ-</u> | | | |
| Lithology | | Overburden | | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | | |
| 5 | 471.6 | 5.0 | (Begin Core) | 1 | 3.0-5.0 | 1.6 | | ST | 5 |
| 10 | | | <u>Shale: brown to redish brown, highly weathered</u> | 0 / 0 | 3.0 | 2.4 | 80 | 37@7 (1) | 8.0 |
| | | | | 26 / 0 | 5.0 | 4.9 | 98 | 20@12 (2) | 13.0 |
| 15 | 460.6 | 16.0 | | 27 / 0 | 5.0 | 5.0 | 100 | 83@17 (2) | 18.0 |
| 20 | | | <u>Shale: gray, sandy to silty</u> | 90 / 0 | 5.0 | 5.0 | 100 | 89@22 (3) | 23.0 |
| 25 | | | | 90 / 0 | 5.0 | 4.9 | 98 | 86@27 (4) | 28.0 |
| 30 | 448.6 | 28.0 | (Bottom of Hole 28.0') | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

Top of Rock = 5.0'
Elevation = 471.6'

RDZ = 13.0'
Elevation = 463.6'

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|--|--|
| Location: <input type="text" value="1037+00 70.0' Lt."/> | Hole #: <input type="text" value="1"/> |
| Lab ID#: <input type="text" value="1"/> | Depth (ft): <input type="text" value="3-5"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|------------------------------------|------------|------------------------------------|------------|------------------------------------|
| 3" | <input type="text" value="100.0"/> | 2" | <input type="text" value="100.0"/> | 1" | <input type="text" value="100.0"/> |
| 3/4" | <input type="text" value="100.0"/> | 3/8" | <input type="text" value="100.0"/> | No. 4 | <input type="text" value="96.0"/> |
| No. 10 | <input type="text" value="91.5"/> | No. 40 | <input type="text" value="86.5"/> | No. 200 | <input type="text" value="72.7"/> |
| 0.002 mm | <input type="text" value="22.7"/> | | | | |

| | | | |
|------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| Gravel (-3" + No. 10) | <input type="text" value="8.5"/> | Coarse Sand (-No. 10 + No. 40) | <input type="text" value="5.0"/> |
| Fine Sand (-No. 40 +No. 200) | <input type="text" value="13.8"/> | Silts (-No. 200 + 0.002mm) | <input type="text" value="50.0"/> |
| Clay (-0.002mm) | <input type="text" value="22.7"/> | Colloids (-0.001mm) | <input type="text" value="20.4"/> |

| | | | |
|---|--|---|--|
| Liquid Limit: <input type="text" value="31"/> | Plastic Limit: <input type="text" value="15"/> | Plasticity Index: <input type="text" value="16"/> | |
| | Activity: <input type="text" value="0.71"/> | Spec. Gravity: <input type="text" value="2.630"/> | |

AASHTO Classification:
 Unified Classification:

| | |
|------------|------------------------------------|
| D 10 (mm): | <input type="text" value="0.000"/> |
| D 30 (mm): | <input type="text" value="0.003"/> |
| D 50 (mm): | <input type="text" value="0.014"/> |
| D 60 (mm): | <input type="text" value="0.030"/> |
| D 90 (mm): | <input type="text" value="1.257"/> |
| D 95 (mm): | <input type="text" value="3.946"/> |

NAT MT =
 LIQ =

Sieve Type:
 Notes:
 Silts + Clays + Colloids:

Cu =
 Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------|
| Hole Number <u>2</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>core</u> |
| Surface Elevation <u>484.5'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>50.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.215634</u> | <u>GQ-</u> |
| Location <u>1058+80.00 80.0' Rt.</u> | Geologist <u>Brad Williams</u> | Longitude(83) <u>-87.444277</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|---|--------------|------------|------------|-----------|-----------|------------------------|---|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | | |
| 476.5 | 8.0 | | (Begin Core) | | | | | | |
| 463.1 | 21.4 | <u>Shale: brown, clayey, sandstone partings, weathered</u> | | 10 / 0 | 5.0 | 4.5 | 90 | 27@10 (1) | 13.0 near vertical water stained joint @ 12.9-13 sandstone parting @ 13.4-13.7 sandstone parting @ 13.8-14.2 broken and fractured @ 17.8-19.2 joint 78 degrees @ 17.9-18.1 joint 48 degrees @ 18.4-18.6 near vertical joint @ 19.1-19.3 |
| | | | | 0 / 0 | 5.0 | 5.0 | 100 | 70@15 (2) | |
| | | | | 0 / 0 | 5.0 | 5.0 | 100 | 71@20 (2) | |
| 457.2 | 27.3 | <u>Shale: dark gray, slightly weathered, sandstone parting.</u> | | | | | | 59@25 (2) | |
| 447.4 | 37.1 | <u>Shale: gray, sandy to silty, sandstone parting</u> | | 30 / 0 | 10.0 | 9.7 | 97 | 90@30 (2) | |
| 444.4 | 40.1 | <u>Shale: gray, sandy and silty</u> | | 23 / 10 | 10.0 | 9.8 | 98 | 90@35 (3) 92@40 (4) | |
| 434.5 | 50.0 | <u>Shale: gray, clayey</u> | | 12 / 0 | 7.0 | 6.2 | 89 | 73@45 (4) | |

Top of Rock = 8.0'
 Elevation = 476.5'

RDZ = 13.5'
 Elevation = 471.0'

GEOLOGIST'S SUBSURFACE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------|
| Hole Number <u>2</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>core</u> |
| Surface Elevation <u>484.5'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>50.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.215634</u> | <u>GQ-</u> |
| Location <u>1058+80.00 80.0' Rt.</u> | Geologist <u>Brad Williams</u> | Longitude(83) <u>-87.444277</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|------------------------|------------|------------|------------|-----------|-----------|--------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | (Bottom of Hole 50.0') | | | | | | 81@50 (2) | |
| 55 | | | | | | | | | 55 |
| 60 | | | | | | | | | 60 |
| 65 | | | | | | | | | 65 |
| 70 | | | | | | | | | 70 |
| 75 | | | | | | | | | 75 |
| 80 | | | | | | | | | 80 |
| 85 | | | | | | | | | 85 |
| 90 | | | | | | | | | 90 |
| 95 | | | | | | | | | 95 |
| 100 | | | | | | | | | 100 |

Top of Rock = 8.0'
 Elevation = 476.5'

RDZ = 13.5'
 Elevation = 471.0'

GEOLOGIST'S SUBSURFACE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------|
| Hole Number <u>3</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/16/2013</u> | Hole Type <u>core</u> |
| Surface Elevation <u>465.4'</u> | Static Water Depth <u>NA</u> | End Date <u>07/16/2013</u> | Rig Number <u> </u> |
| Total Depth <u>33.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.217148</u> | <u>GQ-</u> |
| Location <u>1064+00.00 40.0' Rt.</u> | Geologist <u>Brad Williams</u> | Longitude(83) <u>-87.443325</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|---|--------------|------------|------------|-----------|-----------|--------------|--------------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | | |
| 5 | | | | | | | | | 5 |
| 456.4 | 9.0 | | (Begin Core) | | | | | | |
| 10 | | <u>Cored Overburden</u> | | | | | | | 10 |
| 454.4 | 11.0 | | | 0 / 0 | 4.0 | 2.7 | 68 | 46@12 (2) | 13.0 |
| 15 | | <u>Shale: brown, highly weathered, clayey</u> | | 0 / 0 | 5.0 | 4.9 | 98 | 32@17 (2) | 18.0 |
| 20 | | | | 0 / 0 | 5.0 | 5.0 | 100 | 47@22 (2) | 20.0 |
| 442.7 | 22.7 | | | | | | | | 23.0 |
| 25 | | <u>Shale: dark gray, slightly weathered, clayey</u> | | | | | | | 25 |
| 439.9 | 25.5 | | | 0 / 0 | 5.0 | 4.9 | 98 | 89@27 (4) | 28.0 |
| 30 | | <u>Shale: gray, silty, sandy, clayey, with sandstone parting.</u> | | | | | | | |
| 432.4 | 33.0 | | | | 0 / 0 | 5.0 | 4.9 | 98 | 96@32 (5) |
| 35 | | | | | | | | | 35 |
| | | (Bottom of Hole 33.0') | | | | | | | |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |

Top of Rock = 11.0'
 Elevation = 454.4'

RDZ = 18.0'
 Elevation = 447.4'

near vertical joint @ 17.3-17.5
 near vertical joint @ 18.5-18.7
 sandstone parting @ 32.1-32.5

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|---|-------|---|-----------------------------------|--|------------|-------------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | | | | | | | |
| Hole Number <u>4</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/18/2013</u> | | Hole Type <u>core</u> | | | |
| Surface Elevation <u>462.7'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/18/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>20.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.227552</u> | | <u>GQ-</u> | | | |
| Location <u>1102+00.00 95.0' Rt.</u> | | Geologist <u>Brad Williams</u> | | Longitude(83) <u>-87.444326</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | | |
| | | (Begin Core) | | | | | | | |
| 5 | | | | | | | | | 5 |
| 453.6 | 9.1 | | | | | | | | |
| 10 | | <u>Cored Overburden</u> | | 0 / 0 | 0.9 | 0.7 | 78 | | 10.0 |
| 450.3 | 12.4 | | | | | | | | |
| | | <u>Shale: brown, highly weathered</u> | | 0 / 0 | 5.0 | 4.4 | 88 | 17@13 (1) | 15.0 |
| 15 | 447.7 | | | | | | | | 15 |
| 446.3 | 16.4 | <u>Shale: black, silty, carbonaceous</u> | | | | | | | |
| | | <u>Shale: gray, clayey to silty</u> | | 7 / 0 | 5.0 | 5.0 | 100 | 11@18 (1) | 20.0 |
| 20 | 442.7 | | | | | | | | 20 |
| | | (Bottom of Hole 20.0') | | | | | | | |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |
| Top of Rock = 0.0' Elevation = 462.7' | | | RDZ = 15.0' Elevation = 447.7' | | | | | | |

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | |
|---|-------|--|------------|--|--|---|-------------|---------|
| Hole Number <u>5</u> Surface Elevation <u>475.5'</u> Total Depth <u>28.0'</u> Location <u>5008+00.00 20.0' Rt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u>Brad Williams</u> | | Start Date <u>07/18/2013</u> End Date <u>07/18/2013</u> Latitude(83) <u>37.212224</u> Longitude(83) <u>-87.450803</u> | | Hole Type <u>core</u> Rig_Number <u> </u> <u>GQ-</u> | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | |
| 5 | | | | | | | | 5 |
| 468.5 | 7.0 | (Begin Core) | | | | | | |
| 467.5 | 8.0 | <u>Cored Overburden</u> | 0 / 0 | 1.0 | 0.8 | 80 | | 8.0 |
| 10 | | <u>Shale: dark gray to light gray, clayey weathered</u> | 0 / 0 | 5.0 | 4.8 | 96 | 24@10 (1) | 10 |
| 462.5 | 13.0 | | | | | | | 13.0 |
| 461.5 | 14.0 | <u>Shale: gray, silty, fractured, broken</u> | | | | | | 15 |
| 15 | | <u>Shale: reddish brown to gray, weathered, broken fractured, clay parting</u> | 0 / 0 | 5.0 | 5.0 | 100 | 41@15 (2) | 15 |
| 459.6 | 15.9 | | | | | | | 18.0 |
| 457.9 | 17.6 | <u>Shale: light gray, very sandy</u> | | | | | | 20 |
| 457.2 | 18.3 | <u>Shale: brown, weathered</u> | | | | | | 20 |
| 20 | | | 30 / 0 | 5.0 | 5.0 | 100 | 75@20 (3) | 20 |
| | | <u>Shale: light gray to dark gray, silty, sandstone partings.</u> | | | | | | 23.0 |
| 25 | | | 40 / 0 | 5.0 | 5.0 | 100 | 94@25 (5) | 25 |
| 447.5 | 28.0 | | | | | | | 28.0 |
| 30 | | (Bottom of Hole 28.0') | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

Top of Rock = 8.0'
Elevation = 467.5'

RDZ = 19.0'
Elevation = 456.5'

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|---|-------|--|-----------------------------------|---------------------------------|------------|------------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225.</u> | | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>6</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/23/2013</u> | | Hole Type <u>core</u> | | | |
| Surface Elevation <u>434.1'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/23/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>15.4'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221067</u> | | <u>GQ-</u> | | | |
| Location <u>9612+00.00 20.0' Rt.</u> | | Geologist <u>Brad Williams</u> | | Longitude(83) <u>-87.443931</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | | |
| | | (Begin Core) | | | | | | | |
| 5 | | | | | | | | | 5 |
| 425.1 | 9.0 | | | | | | | | |
| 10 | | | | 0 / 0 | 3.0 | 2.9 | 97 | | 10 |
| | | <u>Cored Overburden RDZ EXCEEDS 15.4</u> | | | | | | | 12.0 |
| 15 | 418.7 | | | 0 / 0 | 3.4 | 3.4 | 100 | | 15 |
| | | | | | | | | | 15.4 |
| 20 | | | | | | | | | 20 |
| | | (Bottom of Hole 15.4') | | | | | | | |
| 25 | | | | | | | | | 25 |
| 30 | | | | | | | | | 30 |
| 35 | | | | | | | | | 35 |
| 40 | | | | | | | | | 40 |
| 45 | | | | | | | | | 45 |
| 50 | | | | | | | | | 50 |
| Top of Rock = 15.4' Elevation = 418.7' | | | RDZ = 15.4' Elevation = 418.7' | | | | | | |

SUBSURFACE PROFILE LOG

| | | |
|--------------------------------------|--------------------------------|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|---|--|--|-------------------------------------|
| Hole Number <u>7</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/18/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>466.5'</u> | Static Water Depth <u>NA</u> | End Date <u>07/18/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>7.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.212771</u> | |
| Location <u>1033+00.00 80.0' Lt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.451728</u> | |

| Elevation | Depth | Description | | | Jar # | NMC (%) |
|-----------|-------|---|--|--|------------------|---------|
| 5 | | Brown, silty lean, clay (topsoil 0.0-0.7) Bag #4 | | | NMC #1 @ 2.5' | 14.4 |
| 459.5 | 7.0 | (No Refusal) | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |
| 35 | | | | | | |
| 40 | | | | | | |
| 45 | | | | | | |
| 50 | | | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225.</u> | | | |
| Hole Number <u>8</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/18/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>476.7'</u> | Static Water Depth <u>NA</u> | End Date <u>07/18/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>9.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.212821</u> | |
| Location <u>1036+00.00 75.0' Lt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.450732</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|---|------------------|---------|
| 5 | | Brown, silty lean, clay (topsoil 0.0-0.7) Soil Type #4 | NMC #1 @ 2.5' | 15.2 |
| 467.7 | 9.0 | | NMC #2 @ 7.5' | 14.7 |
| 10 | | (No Refusal) | | |
| 15 | | | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|---|--|--|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225.</u> | | | |
| Hole Number <u>9</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>477.9'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>10.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.212991</u> | |
| Location <u>1039+00.00 80.0' Lt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.449756</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) | | |
|-----------|-------|--|------------------|---------|----|--|
| 5 | | Stiff, brown, silty lean clay (topsoil 0.0-0.3) Soil Type #1 | NMC #1 @ 2.5' | 15.9 | 5 | |
| 469.5 | 8.4 | | | | | |
| 10 467.9 | 10.0 | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 (No Refusal) | NMC #2 @ 7' | 12.2 | 10 | |
| 15 | | | | | 15 | |
| 20 | | | | | 20 | |
| 25 | | | | | 25 | |
| 30 | | | | | 30 | |
| 35 | | | | | 35 | |
| 40 | | | | | 40 | |
| 45 | | | | | 45 | |
| 50 | | | | | 50 | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|---------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225.</u> | | | |
| Hole Number <u>10</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/12/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>466.3'</u> | Static Water Depth <u>NA</u> | End Date <u>07/12/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>12.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.213031</u> | |
| Location <u>1042+00.00 CL</u> | Geologist <u> </u> | Longitude(83) <u>-87.448707</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|--|------------------|---------|
| 5 | | | | |
| 457.3 | 9.0 | Stiff, brown, silty lean clay (topsoil 0.0-0.3) Bag #1 | NMC #1 @ 2.4' | 16.3 |
| 10 | | | | |
| 454.3 | 12.0 | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 | NMC #2 @ 8.5' | 10.2 |
| 15 | | (No Refusal) | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|--|
| Location: <input style="width: 90%;" type="text" value="1042+00 CL"/> | Hole #: <input style="width: 90%;" type="text" value="10"/> |
| Lab ID#: <input style="width: 90%;" type="text" value="1"/> | Depth (ft): <input style="width: 90%;" type="text" value="0-9"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|--|------------|--|------------|--|
| 3" | <input style="width: 80%;" type="text" value="100.0"/> | 2" | <input style="width: 80%;" type="text" value="100.0"/> | 1" | <input style="width: 80%;" type="text" value="100.0"/> |
| 3/4" | <input style="width: 80%;" type="text" value="100.0"/> | 3/8" | <input style="width: 80%;" type="text" value="100.0"/> | No. 4 | <input style="width: 80%;" type="text" value="100.0"/> |
| No. 10 | <input style="width: 80%;" type="text" value="100.0"/> | No. 40 | <input style="width: 80%;" type="text" value="98.2"/> | No. 200 | <input style="width: 80%;" type="text" value="68.9"/> |
| 0.002 mm | <input style="width: 80%;" type="text" value="21.3"/> | | | | |

| | | | |
|-------------------------------|---|--------------------------------|---|
| Gravel (-3" + No. 10) | <input style="width: 90%;" type="text" value="0.0"/> | Coarse Sand (-No. 10 + No. 40) | <input style="width: 90%;" type="text" value="1.8"/> |
| Fine Sand (-No. 40 + No. 200) | <input style="width: 90%;" type="text" value="29.4"/> | Silts (-No. 200 + 0.002mm) | <input style="width: 90%;" type="text" value="47.6"/> |
| Clay (-0.002mm) | <input style="width: 90%;" type="text" value="21.3"/> | Colloids (-0.001mm) | <input style="width: 90%;" type="text" value="16.4"/> |

| | | | |
|---|--|---|--|
| Liquid Limit: <input style="width: 90%;" type="text" value="28"/> | Plastic Limit: <input style="width: 90%;" type="text" value="20"/> | Plasticity Index: <input style="width: 90%;" type="text" value="8"/> | |
| | Activity: <input style="width: 90%;" type="text" value="0.38"/> | Spec. Gravity: <input style="width: 90%;" type="text" value="2.669"/> | |

| | |
|-------------------------|--|
| AASHTO Classification: | <input style="width: 90%;" type="text" value="A-4 (4)"/> |
| Unified Classification: | <input style="width: 90%;" type="text" value="CL"/> |

| | |
|------------|--|
| D 10 (mm): | <input style="width: 80%;" type="text" value="0.000"/> |
| D 30 (mm): | <input style="width: 80%;" type="text" value="0.004"/> |
| D 50 (mm): | <input style="width: 80%;" type="text" value="0.018"/> |
| D 60 (mm): | <input style="width: 80%;" type="text" value="0.038"/> |
| D 90 (mm): | <input style="width: 80%;" type="text" value="0.262"/> |
| D 95 (mm): | <input style="width: 80%;" type="text" value="0.352"/> |

| | |
|----------|---|
| NAT MT = | <input style="width: 90%;" type="text" value="13.23"/> |
| LIQ = | <input style="width: 90%;" type="text" value="-0.84568"/> |

| | |
|--|--|
| Sieve Type: <input style="width: 90%;" type="text" value="No Gravel"/> | |
| Notes: <input style="width: 90%;" type="text"/> | |
| Silts + Clays + Colloids: | <input style="width: 90%;" type="text" value="N/A"/> |

| | |
|------|--|
| Cu = | <input style="width: 90%;" type="text"/> |
| Cc = | <input style="width: 90%;" type="text"/> |

Remarks:

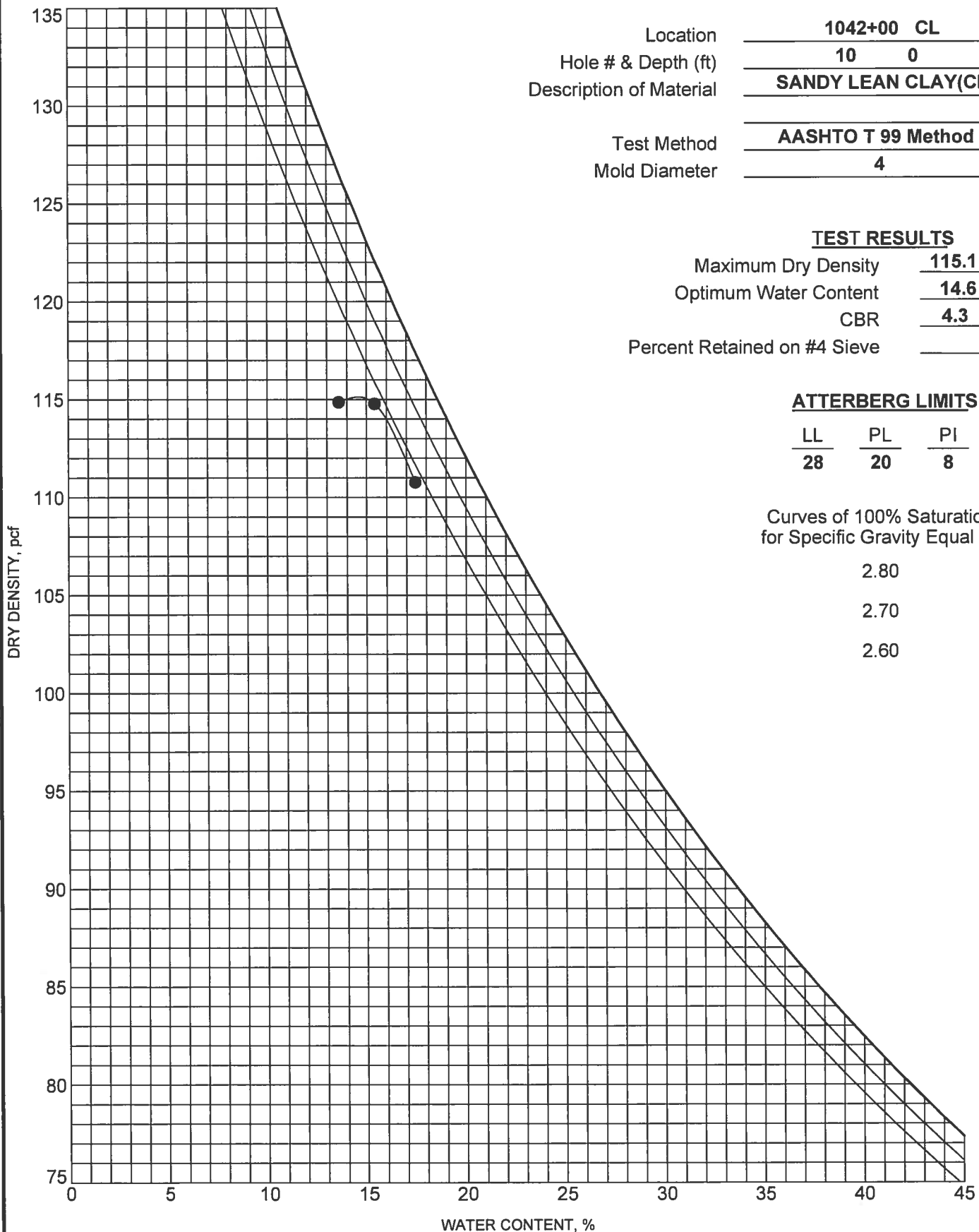
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



Location 1042+00 CL
 Hole # & Depth (ft) 10 0
 Description of Material SANDY LEAN CLAY(CL)
 Test Method AASHTO T 99 Method A
 Mold Diameter 4

TEST RESULTS

Maximum Dry Density 115.1 PCF
 Optimum Water Content 14.6 %
 CBR 4.3
 Percent Retained on #4 Sieve _____

ATTERBERG LIMITS

| LL | PL | PI |
|----|----|----|
| 28 | 20 | 8 |

Curves of 100% Saturation
 for Specific Gravity Equal to:

- 2.80
- 2.70
- 2.60

SUBSURFACE PROFILE LOG

| | | | |
|---|--|---|-------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>11</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/16/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>458.8'</u> | Static Water Depth <u>NA</u> | End Date <u>07/16/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>15.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.213424</u> | |
| Location <u>1044+00.00 70.0' Lt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.448181</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) | | |
|-------------|-------|--|------------------|---------|----|----|
| 5 453.8 | 5.0 | Stiff, brown, silty lean clay Soil Type #1 | NMC #1 @ 2.5' | 18.0 | 5 | 5 |
| 10 443.8 | 15.0 | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 | NMC #2 @ 7.5' | 13.2 | 10 | 10 |
| 20 | | (No Refusal) | | | 15 | 15 |
| 25 | | | | | 20 | 20 |
| 30 | | | | | 25 | 25 |
| 35 | | | | | 30 | 30 |
| 40 | | | | | 35 | 35 |
| 45 | | | | | 40 | 40 |
| 50 | | | | | 45 | 45 |
| 50 | | | | | 50 | 50 |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|--------------------------------------|---------------------------------|------------------------------------|------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>12</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/18/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>438.0'</u> | Static Water Depth <u>NA</u> | End Date <u>07/18/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>10.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.214003</u> | |
| Location <u>1050+00.00 60.0' Rt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.446211</u> | |

| Elevation | Depth | Description | | | Jar # | NMC (%) |
|-------------|-------|---|--|--|------------------|---------|
| 5 | | Stiff, brown, silty lean clay Bag #3 | | | NMC #1 @ 2.5' | 18.7 |
| 10 428.0 | 10.0 | | | | NMC #2 @ 7.5' | 15.2 |
| 15 | | (No Refusal) | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |
| 35 | | | | | | |
| 40 | | | | | | |
| 45 | | | | | | |
| 50 | | | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|--|---|
| Location: <input type="text" value="1050+00 60.0' Rt."/> | Hole #: <input type="text" value="12"/> |
| Lab ID#: <input type="text" value="3"/> | Depth (ft): <input type="text" value="0-10"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|------------------------------------|------------|------------------------------------|------------|------------------------------------|
| 3" | <input type="text" value="100.0"/> | 2" | <input type="text" value="100.0"/> | 1" | <input type="text" value="100.0"/> |
| 3/4" | <input type="text" value="100.0"/> | 3/8" | <input type="text" value="99.1"/> | No. 4 | <input type="text" value="97.8"/> |
| No. 10 | <input type="text" value="96.4"/> | No. 40 | <input type="text" value="90.9"/> | No. 200 | <input type="text" value="74.7"/> |
| 0.002 mm | <input type="text" value="26.7"/> | | | | |

| | | | |
|------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| Gravel (-3" + No. 10) | <input type="text" value="3.6"/> | Coarse Sand (-No. 10 + No. 40) | <input type="text" value="5.5"/> |
| Fine Sand (-No. 40 +No. 200) | <input type="text" value="16.2"/> | Silts (-No. 200 + 0.002mm) | <input type="text" value="47.9"/> |
| Clay (-0.002mm) | <input type="text" value="26.7"/> | Colloids (-0.001mm) | <input type="text" value="22.0"/> |

| | | | |
|---|--|---|--|
| Liquid Limit: <input type="text" value="34"/> | Plastic Limit: <input type="text" value="22"/> | Plasticity Index: <input type="text" value="12"/> | |
| | Activity: <input type="text" value="0.45"/> | Spec. Gravity: <input type="text" value="2.600"/> | |

| | |
|-------------------------|--------------------------------------|
| AASHTO Classification: | <input type="text" value="A-6 (8)"/> |
| Unified Classification: | <input type="text" value="CL"/> |

| | |
|------------|------------------------------------|
| D 10 (mm): | <input type="text" value="0.000"/> |
| D 30 (mm): | <input type="text" value="0.003"/> |
| D 50 (mm): | <input type="text" value="0.012"/> |
| D 60 (mm): | <input type="text" value="0.025"/> |
| D 90 (mm): | <input type="text" value="0.385"/> |
| D 95 (mm): | <input type="text" value="1.334"/> |

| | |
|----------|---------------------------------------|
| NAT MT = | <input type="text" value="16.95"/> |
| LIQ = | <input type="text" value="-0.42043"/> |

| | |
|---------------------------|--|
| Sieve Type: | <input type="text" value="With Gravel"/> |
| Notes: | <input type="text"/> |
| Silts + Clays + Colloids: | <input type="text" value="N/A"/> |

| | |
|------|----------------------|
| Cu = | <input type="text"/> |
| Cc = | <input type="text"/> |

Remarks:

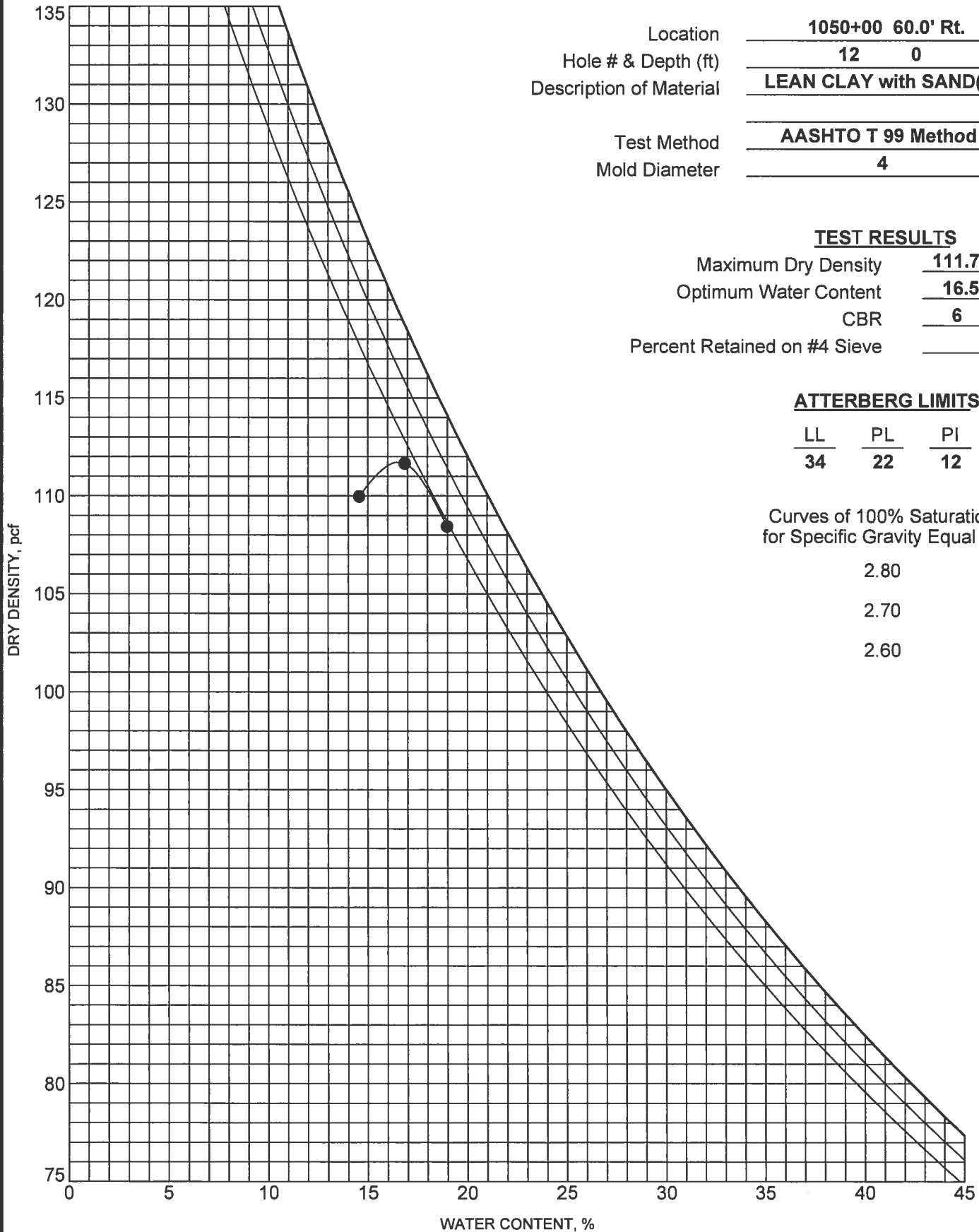
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



Location 1050+00 60.0' Rt.
 Hole # & Depth (ft) 12 0
 Description of Material LEAN CLAY with SAND(CL)
 Test Method AASHTO T 99 Method A
 Mold Diameter 4

TEST RESULTS

Maximum Dry Density 111.7 PCF
 Optimum Water Content 16.5 %
 CBR 6
 Percent Retained on #4 Sieve _____

ATTERBERG LIMITS

| LL | PL | PI |
|-----------|-----------|-----------|
| <u>34</u> | <u>22</u> | <u>12</u> |

Curves of 100% Saturation
 for Specific Gravity Equal to:

- 2.80
- 2.70
- 2.60

SUBSURFACE PROFILE LOG

| | | | |
|---------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225</u> | | | |
| Hole Number <u>13</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>458.0'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>10.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.215097</u> | |
| Location <u>1055+00.00 CL</u> | Geologist <u> </u> | Longitude(83) <u>-87.445125</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|--|------------------|---------|
| 5 | | | | |
| 449.5 | 8.5 | Stiff, brown, silty lean clay Soil Type #3 | NMC #1 @ 2.5' | 17.6 |
| 10 448.0 | 10.0 | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 (No Refusal) | NMC #2 @ 7' | 15.3 |
| 15 | | | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | |
|---|-------------------------|--|
| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> |
|---|-------------------------|--|

| | | | |
|---|---|--|--|
| Hole Number <u>14</u> Surface Elevation <u>481.8'</u> Total Depth <u>12.0'</u> Location <u>1058+00.00 CL</u> | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u> </u> | Start Date <u>07/17/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.215754</u> Longitude(83) <u>-87.444507</u> | Hole Type <u>cut profile</u> Rig_Number <u> </u> |
|---|---|--|--|

| Elevation | Depth | Description | Jar # | NMC (%) | | |
|-------------|-------|--|------------------|---------|----|----|
| 5 475.8 | 6.0 | Stiff, brown, silty lean clay Soil Type #2 | NMC #1 @ 2.5' | 13.7 | 5 | 5 |
| 10 469.8 | 12.0 | Stiff, br - gr, silty clay, grading to weathered shale Bag #8 | NMC #2 @ 6.5' | 13.7 | 10 | 10 |
| 15 | | (No Refusal) | | | 15 | 15 |
| 20 | | | | | 20 | 20 |
| 25 | | | | | 25 | 25 |
| 30 | | | | | 30 | 30 |
| 35 | | | | | 35 | 35 |
| 40 | | | | | 40 | 40 |
| 45 | | | | | 45 | 45 |
| 50 | | | | | 50 | 50 |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: <input style="width: 80%;" type="text" value="1058+00 CL"/> | Hole #: <input style="width: 80%;" type="text" value="14"/> |
| Lab ID#: <input style="width: 80%;" type="text" value="8"/> | Depth (ft): <input style="width: 80%;" type="text" value="6-12"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.2 | No. 200 | 93.4 |
| 0.002 mm | 34.1 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.8 |
| Fine Sand (-No. 40 + No. 200) | 4.9 | Silts (-No. 200 + 0.002mm) | 59.3 |
| Clay (-0.002mm) | 34.1 | Colloids (-0.001mm) | 25.8 |

| | | | |
|---|--|---|--|
| Liquid Limit: <input style="width: 80%;" type="text" value="40"/> | Plastic Limit: <input style="width: 80%;" type="text" value="25"/> | Plasticity Index: <input style="width: 80%;" type="text" value="15"/> | |
| | Activity: <input style="width: 80%;" type="text" value="0.44"/> | Spec. Gravity: <input style="width: 80%;" type="text" value="2.559"/> | |

| | |
|-------------------------|---|
| AASHTO Classification: | <input style="width: 80%;" type="text" value="A-6 (16)"/> |
| Unified Classification: | <input style="width: 80%;" type="text" value="CL"/> |

| | |
|------------|--|
| D 10 (mm): | <input style="width: 80%;" type="text" value="0.000"/> |
| D 30 (mm): | <input style="width: 80%;" type="text" value="0.001"/> |
| D 50 (mm): | <input style="width: 80%;" type="text" value="0.005"/> |
| D 60 (mm): | <input style="width: 80%;" type="text" value="0.010"/> |
| D 90 (mm): | <input style="width: 80%;" type="text" value="0.061"/> |
| D 95 (mm): | <input style="width: 80%;" type="text" value="0.134"/> |

| | |
|----------|---|
| NAT MT = | <input style="width: 80%;" type="text" value="13.66"/> |
| LIQ = | <input style="width: 80%;" type="text" value="-0.75588"/> |

| | |
|---------------------------|--|
| Sieve Type: | <input style="width: 80%;" type="text" value="No Gravel"/> |
| Notes: | <input style="width: 80%;" type="text" value=""/> |
| Silts + Clays + Colloids: | <input style="width: 80%;" type="text" value="N/A"/> |

| | |
|------|---|
| Cu = | <input style="width: 80%;" type="text" value=""/> |
| Cc = | <input style="width: 80%;" type="text" value=""/> |

Remarks:

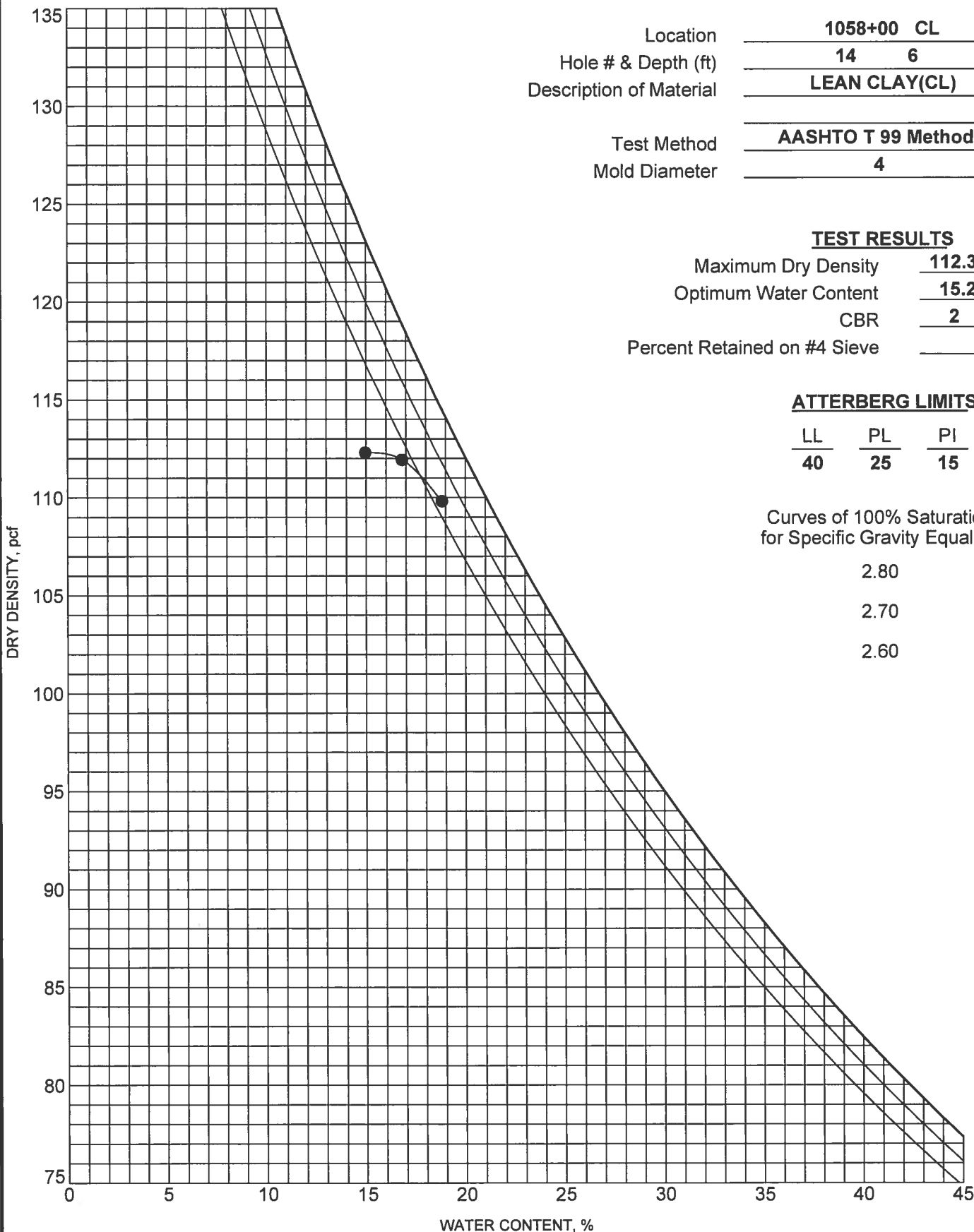
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



SUBSURFACE PROFILE LOG

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225.</u> | | | |
| Hole Number <u>15</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/15/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>454.1'</u> | Static Water Depth <u>NA</u> | End Date <u>07/15/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>15.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.216567</u> | |
| Location <u>1061+00.00 80.0' Lt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.444239</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|--|-----------------|---------|
| 5 | | | | |
| | | Stiff, brown, silty lean clay Bag #2 | NMC #1 @ 4' | 9.9 |
| 10 | 443.1 | 11.0 | NMC #2 @ 9' | 7.6 |
| | 441.1 | 13.0 | NMC #3 @ 12' | 5.6 |
| | | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 | | |
| 15 | 439.1 | 15.0 | | |
| | | Stiff, gray, sandy shale (top of rock 13.0 ft) Soil Type #8 | | |
| | | (No Refusal) | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|--|
| Location: <input style="width:95%;" type="text" value="1061+00 80.0' Lt."/> | Hole #: <input style="width:95%;" type="text" value="15"/> |
| Lab ID#: <input style="width:95%;" type="text" value="2"/> | Depth (ft): <input style="width:95%;" type="text" value="0-11"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|---|------------|---|------------|---|
| 3" | <input style="width:95%;" type="text" value="100.0"/> | 2" | <input style="width:95%;" type="text" value="100.0"/> | 1" | <input style="width:95%;" type="text" value="100.0"/> |
| 3/4" | <input style="width:95%;" type="text" value="100.0"/> | 3/8" | <input style="width:95%;" type="text" value="100.0"/> | No. 4 | <input style="width:95%;" type="text" value="100.0"/> |
| No. 10 | <input style="width:95%;" type="text" value="100.0"/> | No. 40 | <input style="width:95%;" type="text" value="96.9"/> | No. 200 | <input style="width:95%;" type="text" value="91.0"/> |
| 0.002 mm | <input style="width:95%;" type="text" value="29.7"/> | | | | |

| | | | |
|------------------------------|--|--------------------------------|--|
| Gravel (-3" + No. 10) | <input style="width:95%;" type="text" value="0.0"/> | Coarse Sand (-No. 10 + No. 40) | <input style="width:95%;" type="text" value="3.1"/> |
| Fine Sand (-No. 40 +No. 200) | <input style="width:95%;" type="text" value="5.8"/> | Silts (-No. 200 + 0.002mm) | <input style="width:95%;" type="text" value="61.3"/> |
| Clay (-0.002mm) | <input style="width:95%;" type="text" value="29.7"/> | Colloids (-0.001mm) | <input style="width:95%;" type="text" value="21.2"/> |

| | | | |
|--|---|--|--|
| Liquid Limit: <input style="width:95%;" type="text" value="33"/> | Plastic Limit: <input style="width:95%;" type="text" value="22"/> | Plasticity Index: <input style="width:95%;" type="text" value="11"/> | |
| | Activity: <input style="width:95%;" type="text" value="0.37"/> | Spec. Gravity: <input style="width:95%;" type="text" value="2.634"/> | |

| | |
|-------------------------|--|
| AASHTO Classification: | <input style="width:95%;" type="text" value="A-6 (10)"/> |
| Unified Classification: | <input style="width:95%;" type="text" value="CL"/> |

| | |
|------------|---|
| D 10 (mm): | <input style="width:95%;" type="text" value="0.000"/> |
| D 30 (mm): | <input style="width:95%;" type="text" value="0.002"/> |
| D 50 (mm): | <input style="width:95%;" type="text" value="0.007"/> |
| D 60 (mm): | <input style="width:95%;" type="text" value="0.012"/> |
| D 90 (mm): | <input style="width:95%;" type="text" value="0.071"/> |
| D 95 (mm): | <input style="width:95%;" type="text" value="0.244"/> |

| | |
|----------|--|
| NAT MT = | <input style="width:95%;" type="text" value="8.75"/> |
| LIQ = | <input style="width:95%;" type="text" value="-1.20412"/> |

| | |
|---|--|
| Sieve Type: <input style="width:95%;" type="text" value="No Gravel"/> | |
| Notes: <input style="width:95%;" type="text"/> | |
| Silts + Clays + Colloids: <input style="width:95%;" type="text" value="N/A"/> | |

| | |
|------|---|
| Cu = | <input style="width:95%;" type="text"/> |
| Cc = | <input style="width:95%;" type="text"/> |

Remarks:

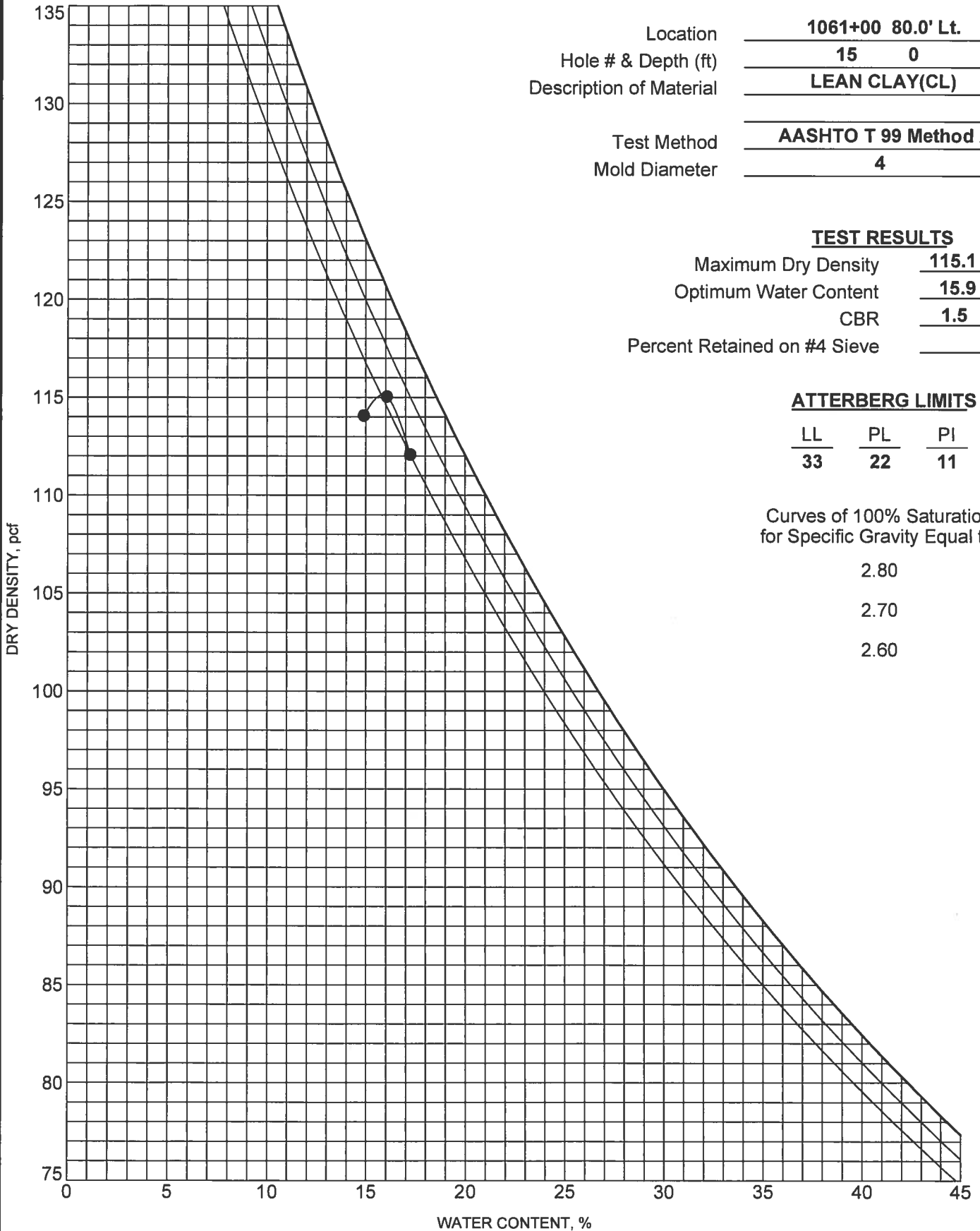
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



| | |
|-------------------------|-----------------------------|
| Location | <u>1061+00 80.0' Lt.</u> |
| Hole # & Depth (ft) | <u>15 0</u> |
| Description of Material | <u>LEAN CLAY(CL)</u> |
| Test Method | <u>AASHTO T 99 Method A</u> |
| Mold Diameter | <u>4</u> |

TEST RESULTS

| | |
|------------------------------|------------------|
| Maximum Dry Density | <u>115.1 PCF</u> |
| Optimum Water Content | <u>15.9 %</u> |
| CBR | <u>1.5</u> |
| Percent Retained on #4 Sieve | <u> </u> |

ATTERBERG LIMITS

| | | |
|-----------|-----------|-----------|
| LL | PL | PI |
| <u>33</u> | <u>22</u> | <u>11</u> |

Curves of 100% Saturation
 for Specific Gravity Equal to:

- 2.80
- 2.70
- 2.60

SUBSURFACE PROFILE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| Hole Number <u>16</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/15/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>456.9'</u> | Static Water Depth <u>NA</u> | End Date <u>07/15/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>24.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.217419</u> | |
| Location <u>1065+00.00 80.0' Rt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.443216</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-------------|-------|--|-------------------|---------|
| 5 | | Stiff, brown, silty lean clay Soil Type #2 | NMC #1 @ 3.5' | 14.5 |
| 10 446.9 | 10.0 | | NMC #2 @ 7.5' | 8.8 |
| 15 | | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 | NMC #3 @ 13' | 8.4 |
| 20 | | | NMC #4 @ 17.5' | 8.8 |
| 25 432.9 | 24.0 | | NMC #5 @ 22' | 6.7 |
| 30 | | (No Refusal) | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------|
| Hole Number <u>17</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>424.9'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>5.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.221321</u> | |
| Location <u>1079+00.00 80.0' Rt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.443018</u> | |

| Elevation | Depth | Description | | | Jar # | NMC (%) |
|-----------|-------|---|----|---|------------------|---------|
| 5 | 419.9 | 5.0 | 5 | 5 | NMC #1 @ 2.5' | 17.0 |
| | | Stiff, brown, silty lean clay (topsoil 0.0-0.3) Bag #5 | | | | |
| | | (No Refusal) | | | | |
| 10 | | | 10 | | | |
| 15 | | | 15 | | | |
| 20 | | | 20 | | | |
| 25 | | | 25 | | | |
| 30 | | | 30 | | | |
| 35 | | | 35 | | | |
| 40 | | | 40 | | | |
| 45 | | | 45 | | | |
| 50 | | | 50 | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|--|--|
| Location: <input style="width: 90%;" type="text" value="1079+00 80.0' Rt."/> | Hole #: <input style="width: 90%;" type="text" value="17"/> |
| Lab ID#: <input style="width: 90%;" type="text" value="5"/> | Depth (ft): <input style="width: 90%;" type="text" value="0-5"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.2 | No. 200 | 93.2 |
| 0.002 mm | 24.5 | | | | |

| | | | |
|------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.8 |
| Fine Sand (-No. 40 +No. 200) | 5.0 | Silts (-No. 200 + 0.002mm) | 68.7 |
| Clay (-0.002mm) | 24.5 | Colloids (-0.001mm) | 21.0 |

| | | | |
|---|--|---|--|
| Liquid Limit: <input style="width: 90%;" type="text" value="34"/> | Plastic Limit: <input style="width: 90%;" type="text" value="21"/> | Plasticity Index: <input style="width: 90%;" type="text" value="13"/> | |
| | Activity: <input style="width: 90%;" type="text" value="0.53"/> | Spec. Gravity: <input style="width: 90%;" type="text" value="2.549"/> | |

| | |
|-------------------------|---|
| AASHTO Classification: | <input style="width: 90%;" type="text" value="A-6 (12)"/> |
| Unified Classification: | <input style="width: 90%;" type="text" value="CL"/> |

| | |
|------------|--|
| D 10 (mm): | <input style="width: 90%;" type="text" value="0.000"/> |
| D 30 (mm): | <input style="width: 90%;" type="text" value="0.003"/> |
| D 50 (mm): | <input style="width: 90%;" type="text" value="0.008"/> |
| D 60 (mm): | <input style="width: 90%;" type="text" value="0.013"/> |
| D 90 (mm): | <input style="width: 90%;" type="text" value="0.063"/> |
| D 95 (mm): | <input style="width: 90%;" type="text" value="0.141"/> |

| | |
|----------|---|
| NAT MT = | <input style="width: 90%;" type="text" value="17.02"/> |
| LIQ = | <input style="width: 90%;" type="text" value="-0.30646"/> |

| |
|--|
| Sieve Type: <input style="width: 90%;" type="text" value="No Gravel"/> |
| Notes: <input style="width: 90%;" type="text"/> |
| Silts + Clays + Colloids: <input style="width: 90%;" type="text" value="N/A"/> |

| | |
|------|--|
| Cu = | <input style="width: 90%;" type="text"/> |
| Cc = | <input style="width: 90%;" type="text"/> |

Remarks:

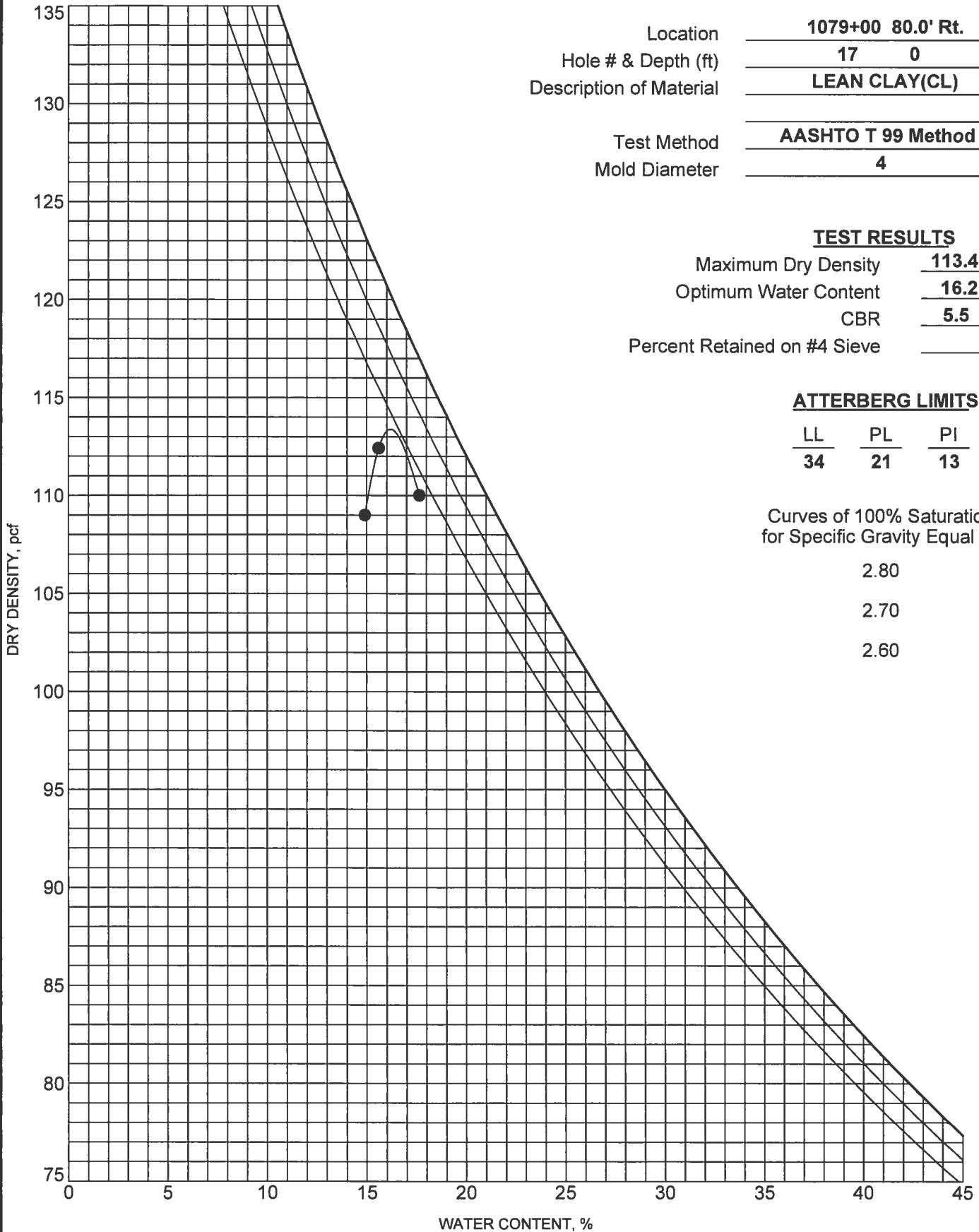
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



Location 1079+00 80.0' Rt.
 Hole # & Depth (ft) 17 0
 Description of Material LEAN CLAY (CL)
 Test Method AASHTO T 99 Method A
 Mold Diameter 4

TEST RESULTS

Maximum Dry Density 113.4 PCF
 Optimum Water Content 16.2 %
 CBR 5.5
 Percent Retained on #4 Sieve _____

ATTERBERG LIMITS

| LL | PL | PI |
|-----------|-----------|-----------|
| <u>34</u> | <u>21</u> | <u>13</u> |

Curves of 100% Saturation
 for Specific Gravity Equal to:
 2.80
 2.70
 2.60

SUBSURFACE PROFILE LOG

| | | | |
|---------------------------------------|---------------------------------|------------------------------------|------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>18</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/17/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>418.9'</u> | Static Water Depth <u>NA</u> | End Date <u>07/17/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>10.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.222683</u> | |
| Location <u>1084+00.00 100.0' Rt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.443253</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-------------|-------|---|------------------|---------|
| 5 | | Stiff, brown, silty lean clay Soil Type #5 | NMC #1 @ 2.5' | 22.8 |
| 10 408.9 | 10.0 | | NMC #2 @ 7.5' | 22.2 |
| 15 | | (No Refusal) | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|---|---|--|--|
| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | |
| Hole Number <u>19</u> Surface Elevation <u>420.4'</u> Total Depth <u>5.0'</u> Location <u>1091+00.00 90.0' Lt.</u> | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u> </u> | Start Date <u>07/17/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.224488</u> Longitude(83) <u>-87.444319</u> | Hole Type <u>cut profile</u> Rig_Number <u> </u> |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|---|------------------|---------|
| 5 | 415.4 | 5.0 | | |
| | | Stiff, brown, silty lean clay (topsoil 0.0-0.6) Bag #6 | NMC #1 @ 2.5' | 21.9 |
| | | (No Refusal) | | |
| 10 | | | | |
| 15 | | | | |
| 20 | | | | |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

SUBSURFACE PROFILE LOG

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225</u> | | | |
| Hole Number <u>20</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/18/2013</u> | Hole Type <u>cut profile</u> |
| Surface Elevation <u>428.7'</u> | Static Water Depth <u>NA</u> | End Date <u>07/18/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>15.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.219456</u> | |
| Location <u>9411+00.00 60.0' Rt.</u> | Geologist <u> </u> | Longitude(83) <u>-87.442567</u> | |

| Elevation | Depth | Description | Jar # | NMC (%) |
|-----------|-------|--|-------------------|---------|
| 5 | | | | |
| 10 | 12.0 | Stiff, brown, silty lean clay (topsoil 0.0 - 0.3) Bag #7 | NMC #1 @ 2.5' | 19.3 |
| 15 | 15.0 | Stiff, br - gr, silty clay, grading to weathered shale Soil Type #8 | NMC #2 @ 7.5' | 20.0 |
| 20 | | (No Refusal) | NMC #3 @ 13.5' | 16.5 |
| 25 | | | | |
| 30 | | | | |
| 35 | | | | |
| 40 | | | | |
| 45 | | | | |
| 50 | | | | |

Bag # - indicates bag was obtained in this boring
 Soil Type # - references soil type from bag sample obtained in a previous boring

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|--|---|
| Location: <input type="text" value="9411+00 60.0' Rt."/> | Hole #: <input type="text" value="20"/> |
| Lab ID#: <input type="text" value="7"/> | Depth (ft): <input type="text" value="0-12"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|------------------------------------|------------|------------------------------------|------------|------------------------------------|
| 3" | <input type="text" value="100.0"/> | 2" | <input type="text" value="100.0"/> | 1" | <input type="text" value="100.0"/> |
| 3/4" | <input type="text" value="100.0"/> | 3/8" | <input type="text" value="100.0"/> | No. 4 | <input type="text" value="100.0"/> |
| No. 10 | <input type="text" value="100.0"/> | No. 40 | <input type="text" value="97.0"/> | No. 200 | <input type="text" value="91.5"/> |
| 0.002 mm | <input type="text" value="24.9"/> | | | | |

| | | | |
|------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| Gravel (-3" + No. 10) | <input type="text" value="0.0"/> | Coarse Sand (-No. 10 + No. 40) | <input type="text" value="3.0"/> |
| Fine Sand (-No. 40 +No. 200) | <input type="text" value="5.5"/> | Silts (-No. 200 + 0.002mm) | <input type="text" value="66.6"/> |
| Clay (-0.002mm) | <input type="text" value="24.9"/> | Colloids (-0.001mm) | <input type="text" value="18.8"/> |

| | | | |
|---|--|---|--|
| Liquid Limit: <input type="text" value="31"/> | Plastic Limit: <input type="text" value="22"/> | Plasticity Index: <input type="text" value="9"/> | |
| | Activity: <input type="text" value="0.36"/> | Spec. Gravity: <input type="text" value="2.545"/> | |

| | |
|-------------------------|--------------------------------------|
| AASHTO Classification: | <input type="text" value="A-4 (8)"/> |
| Unified Classification: | <input type="text" value="CL"/> |

| | |
|------------|------------------------------------|
| D 10 (mm): | <input type="text" value="0.000"/> |
| D 30 (mm): | <input type="text" value="0.003"/> |
| D 50 (mm): | <input type="text" value="0.008"/> |
| D 60 (mm): | <input type="text" value="0.014"/> |
| D 90 (mm): | <input type="text" value="0.069"/> |
| D 95 (mm): | <input type="text" value="0.226"/> |

| | |
|----------|---------------------------------------|
| NAT MT = | <input type="text" value="19.67"/> |
| LIQ = | <input type="text" value="-0.25900"/> |

| | |
|---------------------------|--|
| Sieve Type: | <input type="text" value="No Gravel"/> |
| Notes: | <input type="text"/> |
| Silts + Clays + Colloids: | <input type="text" value="N/A"/> |

| | |
|------|----------------------|
| Cu = | <input type="text"/> |
| Cc = | <input type="text"/> |

Remarks:

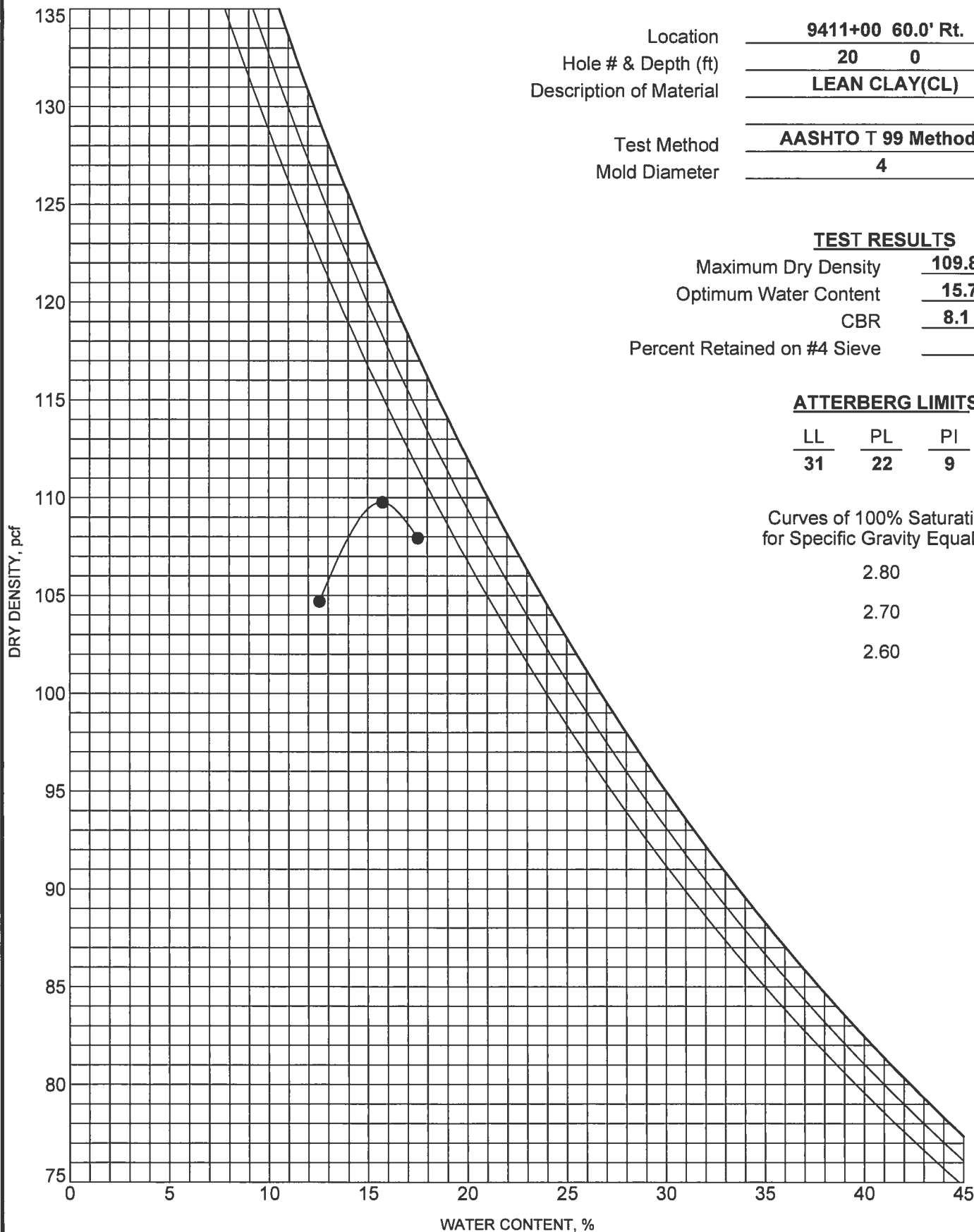
Copies:

MOISTURE-DENSITY RELATIONSHIP

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher



Location 9411+00 60.0' Rt.
 Hole # & Depth (ft) 20 0
 Description of Material LEAN CLAY(CL)
 Test Method AASHTO T 99 Method A
 Mold Diameter 4

TEST RESULTS

Maximum Dry Density 109.8 PCF
 Optimum Water Content 15.7 %
 CBR 8.1
 Percent Retained on #4 Sieve _____

ATTERBERG LIMITS

| LL | PL | PI |
|-----------|-----------|----------|
| <u>31</u> | <u>22</u> | <u>9</u> |

Curves of 100% Saturation
 for Specific Gravity Equal to:
 2.80
 2.70
 2.60

DRILLER'S SUBSURFACE LOG

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225</u> | | | |
| Hole Number <u>21</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/24/2013</u> | Hole Type <u>sample</u> |
| Surface Elevation <u>439.1'</u> | Static Water Depth <u>NA</u> | End Date <u>07/24/2013</u> | Rig Number <u> </u> |
| Total Depth <u>4.3'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.212728</u> | |
| Location <u>1010+00.00 35.0' Lt.</u> | | Longitude(83) <u>-87.459619</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|---------------------------------------|------------|------------|------------|-----------|-----------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 438.6 | 0.5 | Asphalt (7) Core. | | | | | | | |
| 437.8 | 1.3 | Concrete (9") core. | | | | | | | |
| 436.8 | 2.3 | DGA. | | | | | | | |
| 434.8 | 4.3 | Stiff, brown, silty lean clay. | | 1 | 2.3-4.3 | 2.0 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | | |

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 1010+00 35.0' Lt.

Hole #: 21

Lab ID#: 1

Depth (ft): 2.3-4.3

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 97.5 | No. 200 | 88.2 |
| 0.002 mm | 31.0 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 2.5 |
| Fine Sand (-No. 40 + No. 200) | 9.4 | Silts (-No. 200 + 0.002mm) | 57.2 |
| Clay (-0.002mm) | 31.0 | Colloids (-0.001mm) | 26.1 |

Liquid Limit: 34 Plastic Limit: 18
 Activity: 0.52

Plasticity Index: 16
 Spec. Gravity: 2.559

AASHTO Classification: A-6 (13)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.007 |
| D 60 (mm): | 0.013 |
| D 90 (mm): | 0.105 |
| D 95 (mm): | 0.265 |

NAT MT = 21.07
 LIQ = 0.19177

Cu =

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>22</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | |
| Surface Elevation <u>438.8'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig Number <u> </u> | | |
| Total Depth <u>3.9'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212748</u> | | | | |
| Location <u>1010+00.00 47.0' Lt.</u> | | | | Longitude(83) <u>-87.459619</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 438.0 | 0.8 | Asphalt (10") Core. | | | | | | |
| 436.9 | 1.9 | DGA. | | | | | | |
| 434.9 | 3.9 | Stiff, brown, silty lean clay. | 1 | 1.9-3.9 | 2.0 | | ST | |
| 5 | | (Bottom of Hole 3.9') (No Refusal) | | | | | | 5 |
| 10 | | | | | | | | 10 |
| 15 | | | | | | | | 15 |
| 20 | | | | | | | | 20 |
| 25 | | | | | | | | 25 |
| 30 | | | | | | | | 30 |
| 35 | | | | | | | | 35 |
| 40 | | | | | | | | 40 |
| 45 | | | | | | | | 45 |
| 50 | | | | | | | | 50 |

Soil Classification and Gradation Test Results

| | | |
|--------------------------------------|--------------------------------|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: <input style="width:90%;" type="text" value="1010+00 47.0' Lt."/> | Hole #: <input style="width:90%;" type="text" value="22"/> |
| Lab ID#: <input style="width:90%;" type="text" value="1"/> | Depth (ft): <input style="width:90%;" type="text" value="1.9-3.9"/> |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|---|------------|---|------------|---|
| 3" | <input style="width:80%;" type="text" value="100.0"/> | 2" | <input style="width:80%;" type="text" value="100.0"/> | 1" | <input style="width:80%;" type="text" value="100.0"/> |
| 3/4" | <input style="width:80%;" type="text" value="100.0"/> | 3/8" | <input style="width:80%;" type="text" value="100.0"/> | No. 4 | <input style="width:80%;" type="text" value="100.0"/> |
| No. 10 | <input style="width:80%;" type="text" value="100.0"/> | No. 40 | <input style="width:80%;" type="text" value="99.1"/> | No. 200 | <input style="width:80%;" type="text" value="93.0"/> |
| 0.002 mm | <input style="width:80%;" type="text" value="32.7"/> | | | | |

| | | | |
|------------------------------|--|--------------------------------|--|
| Gravel (-3" + No. 10) | <input style="width:80%;" type="text" value="0.0"/> | Coarse Sand (-No. 10 + No. 40) | <input style="width:80%;" type="text" value="0.9"/> |
| Fine Sand (-No. 40 +No. 200) | <input style="width:80%;" type="text" value="6.1"/> | Silts (-No. 200 + 0.002mm) | <input style="width:80%;" type="text" value="60.3"/> |
| Clay (-0.002mm) | <input style="width:80%;" type="text" value="32.7"/> | Colloids (-0.001mm) | <input style="width:80%;" type="text" value="28.5"/> |

| | | |
|--|---|--|
| Liquid Limit: <input style="width:80%;" type="text" value="36"/> | Plastic Limit: <input style="width:80%;" type="text" value="20"/> | Plasticity Index: <input style="width:80%;" type="text" value="16"/> |
| | Activity: <input style="width:80%;" type="text" value="0.49"/> | Spec. Gravity: <input style="width:80%;" type="text" value="2.740"/> |

AASHTO Classification:
 Unified Classification:

| | |
|------------|---|
| D 10 (mm): | <input style="width:80%;" type="text" value="0.000"/> |
| D 30 (mm): | <input style="width:80%;" type="text" value="0.001"/> |
| D 50 (mm): | <input style="width:80%;" type="text" value="0.006"/> |
| D 60 (mm): | <input style="width:80%;" type="text" value="0.010"/> |
| D 90 (mm): | <input style="width:80%;" type="text" value="0.063"/> |
| D 95 (mm): | <input style="width:80%;" type="text" value="0.133"/> |

NAT MT =
 LIQ =

Sieve Type:
 Notes:
 Silts + Clays + Colloids:

Cu =
 Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>23</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>437.3'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig Number <u> </u> | | | |
| Total Depth <u>4.3'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212448</u> | | | | | |
| Location <u>1030+00.00 35.0' Rt.</u> | | | | Longitude(83) <u>-87.452754</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 436.5 | 0.8 | Asphalt (8") Core. | | | | | | | |
| 435.8 | 1.5 | Concrete (9") Core. | | | | | | | |
| 435.0 | 2.3 | DGA. | | | | | | | |
| 433.0 | 4.3 | Stiff, brown, silty lean clay. | | 1 | 2.3-4.3 | 2.0 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | | |

Soil Classification and Gradation Test Results

| | | |
|--------------------------------------|--------------------------------|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: 1030+00 35.0' Rt. | Hole #: 23 |
| Lab ID#: 1 | Depth (ft): 2.3-4.3 |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 97.9 | No. 200 | 93.1 |
| 0.002 mm | 31.6 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 2.1 |
| Fine Sand (-No. 40 + No. 200) | 4.8 | Silts (-No. 200 + 0.002mm) | 61.5 |
| Clay (-0.002mm) | 31.6 | Colloids (-0.001mm) | 28.3 |

| | | | |
|--|---|--|--|
| Liquid Limit: 43 | Plastic Limit: 20 | Plasticity Index: 23 | |
| | Activity: 0.73 | Spec. Gravity: 2.674 | |

AASHTO Classification: A-7-6 (23)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.001 |
| D 50 (mm): | 0.006 |
| D 60 (mm): | 0.011 |
| D 90 (mm): | 0.062 |
| D 95 (mm): | 0.150 |

| | |
|----------|---------|
| NAT MT = | 23.03 |
| LIQ = | 0.13190 |

Cu =

Cc =

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|---|-------|---|------------|--|-------------------------------------|--------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> | | | | | | | |
| Hole Number <u>24</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>457.0'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>3.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.212428</u> | | | | | |
| Location <u>1030+00.00 47.0' Rt.</u> | | | | Longitude(83) <u>-87.452754</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 456.0 | 1.0 | Asphalt (12") Core. | | | | | | | |
| 455.0 | 2.0 | DGA. | | | | | | | |
| 454.0 | 3.0 | Stiff, brown, silty lean clay. | | 1 | 2.0-3.0 | 1.0 | | ST | |
| 5 | | (Bottom of Hole 3.0') (No Refusal) | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | | | | | | |

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 1030+00 47.0' Rt.
 Lab ID#: 1

Hole #: 24
 Depth (ft): 2-3

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 95.8 | No. 200 | 90.0 |
| 0.002 mm | 31.2 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 4.2 |
| Fine Sand (-No. 40 + No. 200) | 5.9 | Silts (-No. 200 + 0.002mm) | 58.8 |
| Clay (-0.002mm) | 31.2 | Colloids (-0.001mm) | 27.8 |

Liquid Limit: 30 Plastic Limit: 18 Plasticity Index: 12
 Activity: 0.38 Spec. Gravity: 2.683

AASHTO Classification: A-6 (10)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.006 |
| D 60 (mm): | 0.012 |
| D 90 (mm): | 0.076 |
| D 95 (mm): | 0.331 |

NAT MT = 16.95
 LIQ = -0.08757

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | |
| Hole Number <u>25</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | |
| Surface Elevation <u>431.4'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | |
| Total Depth <u>4.7'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221034</u> | | | | |
| Location <u>1078+00.00 38.0' Rt.</u> | | | | Longitude(83) <u>-87.443073</u> | | | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 430.7 | 0.7 | Asphalt (8") Core. | | | | | | |
| 429.9 | 1.5 | Concrete (9") Core. | | | | | | |
| 428.7 | 2.7 | DGA. | | | | | | |
| 426.7 | 4.7 | Stiff, brown, silty lean clay. | 1 | 2.7-4.7 | 1.8 | | ST | |
| | | (Bottom of Hole 4.7') (No Refusal) | | | | | | |

Soil Classification and Gradation Test Results

| | | |
|--------------------------------------|--------------------------------|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: 1078+00 38.0' Rt. | Hole #: 25 |
| Lab ID#: 1 | Depth (ft): 2.7-4.7 |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 93.4 | No. 200 | 83.7 |
| 0.002 mm | 22.2 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 6.6 |
| Fine Sand (-No. 40 + No. 200) | 9.7 | Silts (-No. 200 + 0.002mm) | 61.5 |
| Clay (-0.002mm) | 22.2 | Colloids (-0.001mm) | 17.4 |

| | | | |
|--|---|--|--|
| Liquid Limit: 35 | Plastic Limit: 20 | Plasticity Index: 15 | |
| | Activity: 0.68 | Spec. Gravity: 2.642 | |

AASHTO Classification: A-6 (12)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.010 |
| D 60 (mm): | 0.019 |
| D 90 (mm): | 0.231 |
| D 95 (mm): | 0.619 |

NAT MT = 18.39
 LIQ = -0.10747

Sieve Type: No Gravel

Notes:

Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | |
|---|-------|--|------------|--|---|--------------------------------|-----------|-------------|---------|
| Item Number: <u>02-0225</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | |
| Hole Number <u>26</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | |
| Surface Elevation <u>431.2'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | |
| Total Depth <u>4.3'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.221037</u> | | | | | |
| Location <u>1078+00.00 50.0' Rt.</u> | | | | Longitude(83) <u>-87.443059</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 430.7 | 0.5 | Asphalt (6") Core. | | | | | | | |
| 428.9 | 2.3 | DGA. | | | | | | | |
| 426.9 | 4.3 | Stiff, brown, silty lean clay. | | 1 | 2.3-4.3 | 1.5 | | ST | |
| | | (Bottom of Hole 4.3') (No Refusal) | | | | | | | |

Soil Classification and Gradation Test Results

Project ID: **R-042-2013**
 Item Number: **02-0225.**

Hopkins - I-0069

Project Type: **Roadway**
 Project Manager: **Bart Asher**

Location: **1078+00 50.0' Rt.**
 Lab ID#: **1**

Hole #: **26**
 Depth (ft): **2.3-4.3**

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 95.5 | No. 200 | 87.5 |
| 0.002 mm | 23.1 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 4.5 |
| Fine Sand (-No. 40 + No. 200) | 8.0 | Silts (-No. 200 + 0.002mm) | 64.4 |
| Clay (-0.002mm) | 23.1 | Colloids (-0.001mm) | 16.5 |

Liquid Limit: **35** Plastic Limit: **21** Plasticity Index: **14**
 Activity: **0.61** Spec. Gravity: **2.680**

AASHTO Classification: **A-6 (12)**
 Unified Classification: **CL**

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.009 |
| D 60 (mm): | 0.016 |
| D 90 (mm): | 0.130 |
| D 95 (mm): | 0.383 |

NAT MT = **19.78**
 LIQ = **-0.08713**

Sieve Type: **No Gravel**
 Notes:
 Silts + Clays + Colloids: **N/A**

Cu =

Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> | Project Manager: <u>Bart Asher</u> |
| Item Number: <u>02-0225.</u> | | | |
| Hole Number <u>27</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/24/2013</u> | Hole Type <u>sample</u> |
| Surface Elevation <u>440.0'</u> | Static Water Depth <u>NA</u> | End Date <u>07/24/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>4.5'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.225592</u> | |
| Location <u>1095+00.00 35.0' Lt.</u> | | Longitude(83) <u>-87.444401</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|---------------------------------------|------------|------------|------------|-----------|-----------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| 439.2 | 0.8 | Asphalt (10") Core. | | | | | | | |
| 438.4 | 1.6 | Concrete (10") Core. | | | | | | | |
| 437.5 | 2.5 | DGA. | | | | | | | |
| 435.5 | 4.5 | Stiff, brown, silty lean clay. | | 1 | 2.5-4.5 | 2.0 | | ST | |
| | | (Bottom of Hole 4.5') (No Refusal) | | | | | | | |

Soil Classification and Gradation Test Results

Project ID: **R-042-2013**
 Item Number: **02-0225.**

Hopkins - I-0069

Project Type: **Roadway**
 Project Manager: **Bart Asher**

Location: **1095+00 35.0' Lt.**

Hole #: **27**

Lab ID#: **1**

Depth (ft): **2.5-4.5**

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 97.8 | No. 200 | 88.2 |
| 0.002 mm | 26.9 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 2.2 |
| Fine Sand (-No. 40 + No. 200) | 9.6 | Silts (-No. 200 + 0.002mm) | 61.3 |
| Clay (-0.002mm) | 26.9 | Colloids (-0.001mm) | 21.4 |

Liquid Limit: **34** Plastic Limit: **20**
 Activity: **0.52**

Plasticity Index: **14**
 Spec. Gravity: **2.593**

AASHTO Classification: **A-6 (12)**
 Unified Classification: **CL**

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.008 |
| D 60 (mm): | 0.014 |
| D 90 (mm): | 0.104 |
| D 95 (mm): | 0.256 |

NAT MT = **18.39**
 LIQ = **-0.11467**

Cu =

Sieve Type: **No Gravel**
 Notes:
 Silts + Clays + Colloids: **N/A**

Cc =

Remarks:

Copies:

DRILLER'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> | | | | | |
|--------------------------------------|-------|---------------------------------------|------------|---------------------------------|------------------------------------|-------------------------|-----------|-------------|---------|----|
| Item Number: <u>02-0225.</u> | | | | | Project Manager: <u>Bart Asher</u> | | | | | |
| Hole Number <u>28</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/24/2013</u> | | Hole Type <u>sample</u> | | | | |
| Surface Elevation <u>439.5'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/24/2013</u> | | Rig_Number <u> </u> | | | | |
| Total Depth <u>4.0'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.225584</u> | | | | | | |
| Location <u>1095+00.00 50.0' Lt.</u> | | | | Longitude(83) <u>-87.444426</u> | | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks | |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | | |
| 438.9 | 0.6 | Asphalt (7") Core. | | | | | | | | |
| 437.5 | 2.0 | DGA. | | | | | | | | |
| 435.5 | 4.0 | Stiff, brown, silty lean clay. | | 1 | 2.0-4.0 | 1.5 | | ST | | |
| 5 | | (Bottom of Hole 4.0') (No Refusal) | | | | | | | 5 | |
| 10 | | | | | | | | | | 10 |
| 15 | | | | | | | | | | 15 |
| 20 | | | | | | | | | | 20 |
| 25 | | | | | | | | | | 25 |
| 30 | | | | | | | | | | 30 |
| 35 | | | | | | | | | | 35 |
| 40 | | | | | | | | | | 40 |
| 45 | | | | | | | | | | 45 |
| 50 | | | | | | | | | | 50 |

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 1095+00 50.0' Lt.
 Lab ID#: 1

Hole #: 28
 Depth (ft): 2-4

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 96.9 | No. 200 | 86.3 |
| 0.002 mm | 27.2 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 3.1 |
| Fine Sand (-No. 40 + No. 200) | 10.7 | Silts (-No. 200 + 0.002mm) | 59.1 |
| Clay (-0.002mm) | 27.2 | Colloids (-0.001mm) | 20.2 |

Liquid Limit: 31 Plastic Limit: 18 Plasticity Index: 13
 Activity: 0.48 Spec. Gravity: 2.570

AASHTO Classification: A-6 (10)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.008 |
| D 60 (mm): | 0.015 |
| D 90 (mm): | 0.138 |
| D 95 (mm): | 0.311 |

NAT MT = 17.87
 LIQ = -0.00982

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =
 Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|--|------------------------|------------|------------|-----------|-----------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | | | | | | | | |
| | | Overburden | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 426.5 | 8.0 | (Begin Core) | | | | | | | |
| 425.1 | 9.4 | Cored Overburden | | | | | | | |
| 422.2 | 12.3 | Shale: brown to gray, clayey | | 0 / 0 | 4.0 | 3.0 | 75 | 41@11 (2) | 12.0 |
| | | Shale: dark gray to gray, silty to clayey few sandstone laminations | | 68 / 0 | 5.0 | 5.0 | 100 | 89@16 (3) | 17.0 |
| | | | | 72 / 0 | 5.0 | 5.0 | 100 | 91@21 (3) | 22.0 |
| | | | | 76 / 0 | 5.0 | 5.0 | 100 | 74@26 (2) | 27.0 |
| 406.0 | 28.5 | | | 80 / 0 | 1.5 | 1.5 | 100 | | 28.5 |
| | | | (Bottom of Hole 28.5') | | | | | | |

Top of Rock = 9.4' Base Weathered Rock = 12.0'
 Elevation = 425.1' Elevation = 422.5'

ABC is 6 tsf @ 12.0' (422.5')

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9620+25 12.0' Lt.
 Lab ID#: 1

Hole #: 1001
 Depth (ft): 3-5

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 94.7 | No. 200 | 82.0 |
| 0.002 mm | 32.6 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 5.3 |
| Fine Sand (-No. 40 + No. 200) | 12.7 | Silts (-No. 200 + 0.002mm) | 49.5 |
| Clay (-0.002mm) | 32.6 | Colloids (-0.001mm) | 27.9 |

Liquid Limit: 37 Plastic Limit: 23 Plasticity Index: 14
 Activity: 0.43 Spec. Gravity: 2.783

AASHTO Classification: A-6 (11)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.001 |
| D 50 (mm): | 0.007 |
| D 60 (mm): | 0.015 |
| D 90 (mm): | 0.223 |
| D 95 (mm): | 0.464 |

NAT MT = 24.30
 LIQ = 0.09279

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | |
|--|-------|--|------------|--|--|--|-------------|-------------------------------|
| Hole Number <u>1002</u> Surface Elevation <u>438.1'</u> Total Depth <u>29.2'</u> Location <u>9622+50.00 12.0' Lt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u>Brad Williams</u> | | Start Date <u>07/23/2013</u> End Date <u>07/23/2013</u> Latitude(83) <u>37.218253</u> Longitude(83) <u>-87.443220</u> | | Hole Type <u>core and sample</u> Rig_Number <u> </u> <u>GQ-</u> | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | SDI (JS) | |
| | | <u>Overburden</u> | | | | | | |
| | | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 430.1 | 8.0 | (Begin Core) | | | | | | |
| 426.5 | 11.6 | <u>Shale</u> : brown, weathered, with sandstone partings | 23 / 0 | 3.0 | 2.7 | 90 | 77@10 (3) | sandstone parting @ 9.4-9.5 |
| | | | 43 / 0 | 5.1 | 5.1 | 100 | 85@15 (3) | sandstone parting @ 9.9-10 |
| | | | 62 / 0 | 5.0 | 5.0 | 100 | 78@20 (2) | sandstone parting @ 10.1-12.3 |
| | | <u>Shale</u> : gray to dark gray, silty to clayey | 84 / 0 | 5.0 | 5.0 | 100 | 94@25 (3) | |
| 408.9 | 29.2 | | 29 / 0 | 3.1 | 3.1 | 100 | | |
| | | (Bottom of Hole 29.2') | | | | | | |

Top of Rock = 8.0' Base Weathered Rock = 11.6'
 Elevation = 430.1' Elevation = 426.5'

ABC is 8 tsf @ 11.6' (426.5')

Soil Classification and Gradation Test Results

Project ID: **R-042-2013**
 Item Number: **02-0225.**

Hopkins - I-0069

Project Type: **Roadway**
 Project Manager: **Bart Asher**

Location: **9622+50 12.0' Lt.**

Hole #: **1002**

Lab ID#: **1**

Depth (ft): **3-5**

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.6 | No. 200 | 86.6 |
| 0.002 mm | 24.3 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.4 |
| Fine Sand (-No. 40 + No. 200) | 12.0 | Silts (-No. 200 + 0.002mm) | 62.3 |
| Clay (-0.002mm) | 24.3 | Colloids (-0.001mm) | 18.6 |

Liquid Limit: **31** Plastic Limit: **21**
 Activity: **0.41**

Plasticity Index: **10**
 Spec. Gravity: **2.614**

AASHTO Classification: **A-4 (8)**
 Unified Classification: **CL**

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.009 |
| D 60 (mm): | 0.016 |
| D 90 (mm): | 0.123 |
| D 95 (mm): | 0.253 |

NAT MT = **20.65**
 LIQ = **-0.03478**

Sieve Type: **No Gravel**
 Notes:
 Silts + Clays + Colloids: **N/A**

Cu =

Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> | | <u>Hopkins - I-0069</u> | | | | Project Type: <u>Roadway</u> | | | |
|--------------------------------------|-------|---|------------|---------------------------------|------------|----------------------------------|-----------|-------------|---|
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> | | | | | | | |
| Hole Number <u>1003</u> | | Immediate Water Depth <u>NA</u> | | Start Date <u>07/23/2013</u> | | Hole Type <u>core and sample</u> | | | |
| Surface Elevation <u>441.7'</u> | | Static Water Depth <u>NA</u> | | End Date <u>07/23/2013</u> | | Rig Number <u> </u> | | | |
| Total Depth <u>31.5'</u> | | Driller <u>Danny Jessie</u> | | Latitude(83) <u>37.217733</u> | | <u>GQ-</u> | | | |
| Location <u>9624+50.00 12.0' Lt.</u> | | Geologist <u>Brad Williams</u> | | Longitude(83) <u>-87.442998</u> | | | | | |
| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | 1 | 3.0-5.0 | 2.0 | | ST | |
| | | | | | | | | | |
| 10 | 431.7 | (Begin Core) | | 2 | 8.0-9.5 | 1.5 | | ST | |
| | | <u>Shale: brown, weathered, clayey</u> | | 67 / 0 | 3.0 | 2.6 | 87 | 46@12 (2) | near vertical water stained joint @ 11.3-12.4 |
| 15 | 425.5 | <u>Shale: gray to dark gray, silty and clayey</u> | | 76 / 0 | 5.0 | 5.0 | 100 | 82@17 (2) | |
| 20 | | <u>Shale: gray to dary gray, clayey</u> | | 80 / 0 | 5.0 | 4.6 | 92 | 89@22 (2) | |
| 25 | | | | 76 / 0 | 5.0 | 5.0 | 100 | 22@27 (2) | |
| 30 | | | | 43 / 0 | 3.5 | 3.3 | 94 | | |
| 35 | | | | | | | | | |
| | | (Bottom of Hole 31.5') | | | | | | | |

Top of Rock = 10.0' Base Weathered Rock = 12.4' ABC is 8 tsf @ 12.4' (429.3')
 Elevation = 431.7' Elevation = 429.3'

Soil Classification and Gradation Test Results

| | | |
|--------------------------------------|--------------------------------|---|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: 9624+50 12.0' Lt. | Hole #: 1003 |
| Lab ID#: 1 | Depth (ft): 3-5 |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.8 | No. 200 | 91.2 |
| 0.002 mm | 32.1 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.2 |
| Fine Sand (-No. 40 + No. 200) | 7.7 | Silts (-No. 200 + 0.002mm) | 59.1 |
| Clay (-0.002mm) | 32.1 | Colloids (-0.001mm) | 28.7 |

| | | | |
|--|---|--|--|
| Liquid Limit: 31 | Plastic Limit: 18 | Plasticity Index: 13 | |
| | Activity: 0.41 | Spec. Gravity: 2.670 | |

| | |
|-------------------------|----------|
| AASHTO Classification: | A-6 (11) |
| Unified Classification: | CL |

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.001 |
| D 50 (mm): | 0.006 |
| D 60 (mm): | 0.011 |
| D 90 (mm): | 0.070 |
| D 95 (mm): | 0.178 |

| | |
|----------|----------|
| NAT MT = | 17.53 |
| LIQ = | -0.03648 |

| | |
|---|--|
| Sieve Type: No Gravel | |
| Notes: | |
| Silts + Clays + Colloids: N/A | |

Cu =

Cc =

Remarks:

Copies:

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9624+50 12.0' Lt.
 Lab ID#: 2

Hole #: 1003
 Depth (ft): 8-9.5

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 99.5 | No. 200 | 82.1 |
| 0.002 mm | 23.4 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 0.5 |
| Fine Sand (-No. 40 + No. 200) | 17.4 | Silts (-No. 200 + 0.002mm) | 58.7 |
| Clay (-0.002mm) | 23.4 | Colloids (-0.001mm) | 17.0 |

Liquid Limit: 29 Plastic Limit: 20 Plasticity Index: 9
 Activity: 0.38 Spec. Gravity: 2.660

AASHTO Classification: A-4 (6)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.010 |
| D 60 (mm): | 0.019 |
| D 90 (mm): | 0.164 |
| D 95 (mm): | 0.271 |

NAT MT = 14.93
 LIQ = -0.56385

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | | |
|--|-------------|--|--------------|--|--|--|-------------|-------------|--|
| Hole Number <u>1004</u> Surface Elevation <u>467.2'</u> Total Depth <u>38.5'</u> Location <u>9213+50.00 12.0' Lt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u>Brad Williams</u> | | Start Date <u>07/16/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.212966</u> Longitude(83) <u>-87.448004</u> | | Hole Type <u>core and sample</u> Rig_Number <u> </u> <u>GQ-</u> | | | |
| Lithology | Description | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 458.2 | 9.0 | | (Begin Core) | 1 | 8.0-9.0 | 1.0 | 15-50/0.50' | SPT | |
| 457.8 | 9.4 | <u>Cored Overburden</u> | | | | | | | |
| | | <u>Shale: brown, weathered, clayey</u> | | 0 / 0 | 7.0 | 4.7 | 67 | 48@13 (2) | near vertical joint @ 10.7-11 |
| | | | | 10 / 0 | 10.0 | 10.0 | 100 | 18@18 (1) | broken fractured @ 14.6-15.3 near vertical joint @ 14.7-14.8 |
| 444.0 | 23.2 | | | | | | | 55@23 (1) | broken fractured @ 21.2-21.8 broken fractured @ 22-22.6 |
| | | <u>Shale: gray to dark gray, clayey</u> | | 14 / 0 | 10.0 | 10.0 | 100 | 55@28 (3) | |
| | | | | | | | | 60@33 (2) | |
| 428.7 | 38.5 | | | 24 / 0 | 2.5 | 1.7 | 68 | 72@38 (3) | |
| | | (Bottom of Hole 38.5') | | | | | | | |

Top of Rock = 9.4' Base Weathered Rock = 15.0' Elevation = 457.8' Elevation = 452.2' ABC is 6 tsf @ 15.0' (452.2')

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9213+50 12.0' Lt.
 Lab ID#: 1

Hole #: 1004
 Depth (ft): 3-5

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 99.3 | No. 200 | 96.1 |
| 0.002 mm | 28.2 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 0.7 |
| Fine Sand (-No. 40 + No. 200) | 3.2 | Silts (-No. 200 + 0.002mm) | 68.0 |
| Clay (-0.002mm) | 28.2 | Colloids (-0.001mm) | 24.1 |

Liquid Limit: 34 Plastic Limit: 23 Plasticity Index: 11
 Activity: 0.39 Spec. Gravity: 2.533

AASHTO Classification: A-6 (11)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.006 |
| D 60 (mm): | 0.011 |
| D 90 (mm): | 0.054 |
| D 95 (mm): | 0.071 |

NAT MT = 18.22
 LIQ = -0.43415

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =
 Cc =

Remarks:

Copies:

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225.

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9213+50 12.0' Lt.
 Lab ID#: 1

Hole #: 1004
 Depth (ft): 8-9

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.9 | No. 200 | 90.4 |
| 0.002 mm | 24.6 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.1 |
| Fine Sand (-No. 40 + No. 200) | 8.5 | Silts (-No. 200 + 0.002mm) | 65.7 |
| Clay (-0.002mm) | 24.6 | Colloids (-0.001mm) | 18.8 |

Liquid Limit: 31 Plastic Limit: 22 Plasticity Index: 9
 Activity: 0.37 Spec. Gravity: 2.533

AASHTO Classification: A-4 (8)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.008 |
| D 60 (mm): | 0.014 |
| D 90 (mm): | 0.074 |
| D 95 (mm): | 0.194 |

NAT MT = 12.16
 LIQ = -1.09368

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | | | |
|--------------------------------------|---------------------------------|---------------------------------|----------------------------------|
| Hole Number <u>1005</u> | Immediate Water Depth <u>NA</u> | Start Date <u>07/16/2013</u> | Hole Type <u>core and sample</u> |
| Surface Elevation <u>452.6'</u> | Static Water Depth <u>NA</u> | End Date <u>07/16/2013</u> | Rig_Number <u> </u> |
| Total Depth <u>30.0'</u> | Driller <u>Danny Jessie</u> | Latitude(83) <u>37.213041</u> | <u>GQ-</u> |
| Location <u>9215+25.00 12.0' Lt.</u> | Geologist <u>Brad Williams</u> | Longitude(83) <u>-87.448600</u> | |

| Lithology | | Description | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
|-----------|-------|---|--------------|------------|------------|-----------|-------------|-------------|---------|
| Elevation | Depth | | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) | |
| | | <u>Overburden</u> | | 1 | 3.0-5.0 | 2.0 | | ST | |
| 443.6 | 9.0 | | (Begin Core) | 1 | 8.0-9.0 | 1.0 | 17-50/0.50' | SPT | |
| | | <u>Shale</u> : gray, to dark gray, silty and clayey | | 30 / 0 | 8.0 | 7.8 | 98 | 73@10 (3) | |
| | | | | 24 / 0 | 6.0 | 6.0 | 100 | 80@20 (2) | 17.0 |
| | | | | 20 / 0 | 7.0 | 6.8 | 97 | 81@25 (3) | 23.0 |
| 422.6 | 30.0 | | | | | | | 85@15 (4) | 30.0 |
| | | (Bottom of Hole 30.0') | | | | | | 64@30 (3) | |

Top of Rock = 9.0'
 Elevation = 443.6'

Base Weathered Rock = 10.0'
 Elevation = 442.6'

ABC is 8 tsf @ 10.0' (442.6')

Soil Classification and Gradation Test Results

| | | |
|-------------------------------|-------------------------|------------------------------------|
| Project ID: <u>R-042-2013</u> | <u>Hopkins - I-0069</u> | Project Type: <u>Roadway</u> |
| Item Number: <u>02-0225.</u> | | Project Manager: <u>Bart Asher</u> |

| | |
|---|---|
| Location: 9215+25 12.0' Lt. | Hole #: 1005 |
| Lab ID#: 1 | Depth (ft): 3-5 |

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 98.5 | No. 200 | 91.5 |
| 0.002 mm | 40.5 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 1.5 |
| Fine Sand (-No. 40 + No. 200) | 6.9 | Silts (-No. 200 + 0.002mm) | 51.0 |
| Clay (-0.002mm) | 40.5 | Colloids (-0.001mm) | 33.9 |

| | | | |
|--|---|--|--|
| Liquid Limit: 38 | Plastic Limit: 23 | Plasticity Index: 15 | |
| | Activity: 0.37 | Spec. Gravity: 2.595 | |

| | |
|-------------------------|----------|
| AASHTO Classification: | A-6 (15) |
| Unified Classification: | CL |

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.000 |
| D 50 (mm): | 0.004 |
| D 60 (mm): | 0.008 |
| D 90 (mm): | 0.067 |
| D 95 (mm): | 0.178 |

| | |
|----------|----------|
| NAT MT = | 17.29 |
| LIQ = | -0.38069 |

| | |
|---------------------------|-----------|
| Sieve Type: | No Gravel |
| Notes: | |
| Silts + Clays + Colloids: | N/A |

Cu =

Cc =

Remarks:

Copies:

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9215+25 12.0' Lt.

Hole #: 1005

Lab ID#: 1

Depth (ft): 8-9

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 97.5 | No. 200 | 89.8 |
| 0.002 mm | 27.5 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 2.5 |
| Fine Sand (-No. 40 + No. 200) | 7.7 | Silts (-No. 200 + 0.002mm) | 62.3 |
| Clay (-0.002mm) | 27.5 | Colloids (-0.001mm) | 20.5 |

Liquid Limit: 38 Plastic Limit: 24
 Activity: 0.51

Plasticity Index: 14
 Spec. Gravity: 2.667

AASHTO Classification: A-6 (13)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.002 |
| D 50 (mm): | 0.007 |
| D 60 (mm): | 0.013 |
| D 90 (mm): | 0.079 |
| D 95 (mm): | 0.242 |

NAT MT = 26.44
 LIQ = 0.17406

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

GEOLOGIST'S SUBSURFACE LOG

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | | <u>Hopkins - I-0069</u> | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | |
|--|-------|--|------------|--|--|--|-------------|-----------|
| Hole Number <u>1006</u> Surface Elevation <u>473.6'</u> Total Depth <u>43.5'</u> Location <u>9217+25.00 12.0' Lt.</u> | | Immediate Water Depth <u>NA</u> Static Water Depth <u>NA</u> Driller <u>Danny Jessie</u> Geologist <u>Brad Williams</u> | | Start Date <u>07/17/2013</u> End Date <u>07/17/2013</u> Latitude(83) <u>37.213125</u> Longitude(83) <u>-87.449278</u> | | Hole Type <u>core and sample</u> Rig_Number <u> </u> <u>GQ-</u> | | |
| Lithology | | Overburden | Sample No. | Depth (ft) | Rec. (ft) | SPT Blows | Sample Type | Remarks |
| Elevation | Depth | Description | Rock Core | Std/Ky RQD | Run (ft) | Rec (ft) | Rec (%) | SDI (JS) |
| | | <u>Overburden</u> | | | | | | |
| | | | 1 | 3.0-5.0 | 2.0 | | | ST |
| 464.7 | 8.9 | (Begin Core) | 1 | 8.0-8.9 | 0.8 | 10-50/0.40' | | SPT |
| | | <u>Shale: brown to gray, silty, weathered</u> | 23 / 0 | 8.1 | 7.5 | 93 | | 59@10 (2) |
| 456.5 | 17.1 | | | | | | | 77@15 (2) |
| | | <u>Shale: gray, clayey to silty</u> | 22 / 0 | 10.0 | 10.0 | 100 | | 62@20 (3) |
| 446.6 | 27.0 | | | | | | | 71@25 (4) |
| 445.5 | 28.1 | <u>Shale: gray, very sandy</u> | | | | | | |
| 443.0 | 30.6 | <u>Shale: dark gray, clayey</u> | | | | | | |
| 441.9 | 31.7 | <u>Shale: dark gray, sandy</u> | 35 / 0 | 10.0 | 10.0 | 100 | | 83@30 (3) |
| | | <u>Shale: dark gray, clayey</u> | | | | | | 72@35 (2) |
| 430.1 | 43.5 | | 36 / 0 | 6.5 | 6.5 | 100 | | 83@40 (2) |
| | | (Bottom of Hole 43.5') | | | | | | |

Top of Rock = 8.9'
Elevation = 464.7'

Base Weathered Rock = 10.5'
Elevation = 463.1'

ABC is 6 tsf @ 10.5' (463.1')

joint 34 degrees @ 14.2-14.3
joint 33 degrees @ 14.7-15
near vertical joint @ 16-16.1

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9217+25 12.0' Lt.
 Lab ID#: 1

Hole #: 1006
 Depth (ft): 3-5

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 96.6 | No. 200 | 87.4 |
| 0.002 mm | 38.4 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 3.4 |
| Fine Sand (-No. 40 + No. 200) | 9.2 | Silts (-No. 200 + 0.002mm) | 49.0 |
| Clay (-0.002mm) | 38.4 | Colloids (-0.001mm) | 31.7 |

Liquid Limit: 44 Plastic Limit: 23 Plasticity Index: 21
 Activity: 0.55 Spec. Gravity: 2.618

AASHTO Classification: A-7-6 (19)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.000 |
| D 50 (mm): | 0.005 |
| D 60 (mm): | 0.010 |
| D 90 (mm): | 0.122 |
| D 95 (mm): | 0.314 |

NAT MT = 18.75
 LIQ = -0.20238

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =

Cc =

Remarks:

Copies:

Soil Classification and Gradation Test Results

Project ID: R-042-2013
 Item Number: 02-0225

Hopkins - I-0069

Project Type: Roadway
 Project Manager: Bart Asher

Location: 9217+25 12.0' Lt.
 Lab ID#: 1

Hole #: 1006
 Depth (ft): 8-8.9

| Sieve Size | %Passing | Sieve Size | %Passing | Sieve Size | %Passing |
|------------|----------|------------|----------|------------|----------|
| 3" | 100.0 | 2" | 100.0 | 1" | 100.0 |
| 3/4" | 100.0 | 3/8" | 100.0 | No. 4 | 100.0 |
| No. 10 | 100.0 | No. 40 | 99.8 | No. 200 | 90.1 |
| 0.002 mm | 25.3 | | | | |

| | | | |
|-------------------------------|------|--------------------------------|------|
| Gravel (-3" + No. 10) | 0.0 | Coarse Sand (-No. 10 + No. 40) | 0.2 |
| Fine Sand (-No. 40 + No. 200) | 9.6 | Silts (-No. 200 + 0.002mm) | 64.8 |
| Clay (-0.002mm) | 25.3 | Colloids (-0.001mm) | 18.1 |

Liquid Limit: 34 Plastic Limit: 20 Plasticity Index: 14
 Activity: 0.55 Spec. Gravity: 2.701

AASHTO Classification: A-6 (12)
 Unified Classification: CL

| | |
|------------|-------|
| D 10 (mm): | 0.000 |
| D 30 (mm): | 0.003 |
| D 50 (mm): | 0.008 |
| D 60 (mm): | 0.014 |
| D 90 (mm): | 0.074 |
| D 95 (mm): | 0.180 |

NAT MT = 6.25
 LIQ = -0.98214

Sieve Type: No Gravel
 Notes:
 Silts + Clays + Colloids: N/A

Cu =
 Cc =

Remarks:

Copies:

Drilling Firm: Kentucky Transportation Cabinet
 For: Division of Structural Design
 Geotechnical Branch

EXTRUSION LOG

Printed: 8/12/13

Page 1 of 2

| Project ID: <u>R-042-2013</u> Item Number: <u>02-0225.</u> | | | | County: <u>Hopkins</u> Route: <u>I-0069</u> | | | | | Project Type: <u>Roadway</u> Project Manager: <u>Bart Asher</u> | | | | | | | | | | |
|---|----------|-----------|-------|--|------|-------------------|-------------------|---------|--|-------------------------|-------------|------------------------|---------------------|---------------|-----------|---------|----------|---------------|-----|
| Location | Hole No. | Samp. No. | Depth | Moisture Content AASHTO T-265 | | | | | Visual Soil Description | Samp Type | No. of Samp | Penetrometer / Torvane | Request for Testing | | | | | | |
| | | | | Can No. | Tare | Wet Weight + Tare | Dry Weight + Tare | % Water | | | | | QU | Consolidation | Test Type | # Samp. | Pressure | Class. / Wash | |
| 010+00.00 | 47.0' L | 22 | 1 | 1.9 - 3.9 | 18 | 45.0 | 69.8 | 66.9 | 13.2 | BRW & GREY SILTY CLAY | ST | 1 | 3.5 | QU | | | | | 885 |
| 010+00.00 | 35.0' L | 21 | 1 | 2.3 - 4.3 | 1 | 45.5 | 86.3 | 79.2 | 21.1 | BRW & GREY SILT | ST | 1 | 4.0 | QU | | | | | 886 |
| 030+00.00 | 35.0' R | 23 | 1 | 2.3 - 4.3 | 11 | 45.4 | 67.3 | 63.2 | 23.0 | BRW & GREY SILTY CLAY | ST | 1 | 3.5 | QU | | | | | 887 |
| 030+00.00 | 47.0' R | 24 | 1 | 2.0 - 3.0 | 15 | 45.6 | 80.1 | 75.1 | 16.9 | BRW & GREY SILTY CLAY | ST | pan | 0.0 | | | | | | 888 |
| 037+00.00 | 70.0' L | 1 | 1 | 3.0 - 5.0 | 10 | 45.4 | 92.0 | 84.2 | 20.1 | BRW SILT | ST | 1 | 4.5 | QU | | | | | 889 |
| 078+00.00 | 38.0' R | 25 | 1 | 2.7 - 4.7 | 6 | 45.6 | 92.6 | 85.3 | 18.4 | BRW SILTY CLAY | ST | pan | 3.0 | | | | | | 890 |
| 078+00.00 | 50.0' R | 26 | 1 | 2.3 - 4.3 | 8 | 45.2 | 88.8 | 81.6 | 19.8 | BRW & GREY SILT W/SHALE | ST | pan | 4.5 | | | | | | 891 |
| 095+00.00 | 50.0' L | 28 | 1 | 2.0 - 4.0 | 15 | 45.4 | 73.1 | 68.9 | 17.9 | BRW SILT W/SHALE | ST | pan | 4.5 | | | | | | 892 |
| 095+00.00 | 35.0' L | 27 | 1 | 2.5 - 4.5 | 5 | 45.5 | 80.9 | 75.4 | 18.4 | BRW & RED CLAY | ST | 1 | 4.5 | QU | | | | | 893 |
| 0213+50.00 | 12.0' L | 1004 | 1 | 3.0 - 5.0 | 12 | 33.0 | 58.3 | 54.4 | 18.2 | BRW SILTY CLAY | ST | pan | 4.5 | | | | | | 894 |
| | | | 1 | 8.0 - 9.0 | 3 | 45.2 | 73.8 | 70.7 | 12.2 | BRW SILT W/SHALE | SPT | | | | | | | | 895 |
| 0215+25.00 | 12.0' L | 1005 | 1 | 3.0 - 5.0 | 23 | 45.2 | 95.4 | 88.0 | 17.3 | BRW SILTY CLAY | ST | pan | 4.5 | | | | | | 896 |
| | | | 1 | 8.0 - 9.0 | 3 | 45.7 | 56.7 | 54.4 | 26.4 | BRW & GREY SHALE | SPT | | | | | | | | 897 |
| 0217+25.00 | 12.0' L | 1006 | 1 | 3.0 - 5.0 | 26 | 45.4 | 85.3 | 79.0 | 18.8 | BRW SILTY CLAY W/ROCK | ST | 1 | 4.5 | QU | | | | | 898 |
| | | | 1 | 8.0 - 8.9 | 6 | 45.5 | 57.4 | 56.7 | 6.3 | GREY SHALE | SPT | | | | | | | | 899 |
| 0620+25.00 | 12.0' L | 1001 | 1 | 3.0 - 5.0 | 14 | 45.6 | 72.2 | 67.0 | 24.3 | BRW SILT W/SHALE | ST | 1 | 4.5 | QU | | | | | 900 |

KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

895

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

Operator: CHRIS Date: '8-13-13
 County: HOPKINS Hole: 22
 Sample: 1 Depth (ft.): '1.9-3.9
 Station: 1010+00 47LT
 Proj. #: R-042-2013
VISUAL DESC: BRW & GREY SILTY CLAY

Machine #: 90 Load Ring #: A1-506
 PP/Torvane Time to Failure (min): 1.00
 1.) 3.5
 2.) 3.5
 3.) 3.5
 Average: 3.5

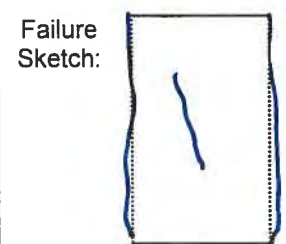
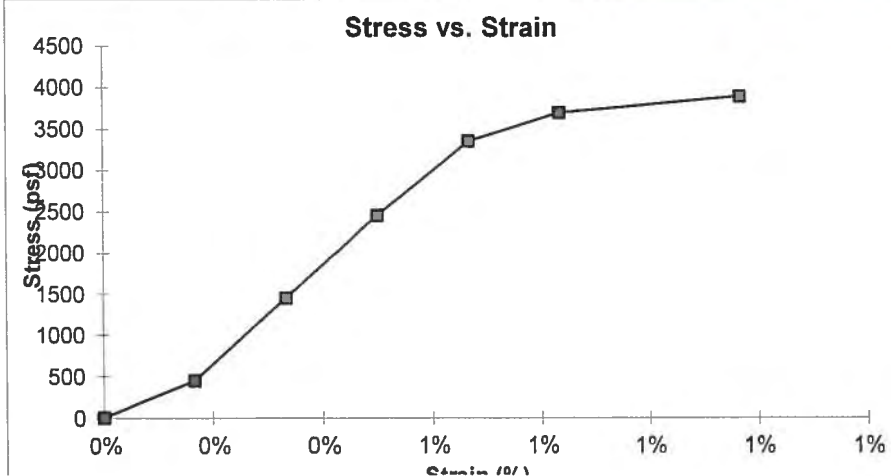
Max. Stress (psi): 26.98 Strain (%): 1.17%
 Max. Stress (psf): 3884.67
 Limiting Stress @ 10 % Strain (psf):
 Max. Stress (kPa): 186.00
 Limiting Stress @ 10 % Strain (kPa):

Initial Diameter **Initial Height**
 1.) 2.87 in. 1.) 6 in.
 2.) 2.87 in. 2.) 6 in.
 3.) 2.87 in. 3.) 6 in.
 Avg.: 2.870 in. Avg.: 6.000 in.
 Avg.: 72.898 mm Avg.: 152.400 mm

Initial Weight: 1238.8 g
 Initial Area: 6.47 in²
 Initial Volume: 38.82 in³

Can #: 7
 Tare: 45.2
 Wet + Tare: 68.2
 Dry + Tare: 65.4
 Moisture (%): 13.9
 Wet Density (pcf): 121.5
 Wet Density (kg/m³): 1948

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0068 | | | 6.48 | 3.09 | 444.72 | 0.17% |
| 0.020 | 0.0222 | | | 6.49 | 10.07 | 1449.45 | 0.33% |
| 0.030 | 0.0376 | | | 6.50 | 17.02 | 2450.81 | 0.50% |
| 0.040 | 0.0515 | | | 6.51 | 23.27 | 3351.21 | 0.67% |
| 0.050 | 0.0568 | | | 6.52 | 25.62 | 3689.89 | 0.83% |
| 0.070 | 0.0600 | | | 6.55 | 26.98 | 3884.67 | 1.17% |
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Remarks:

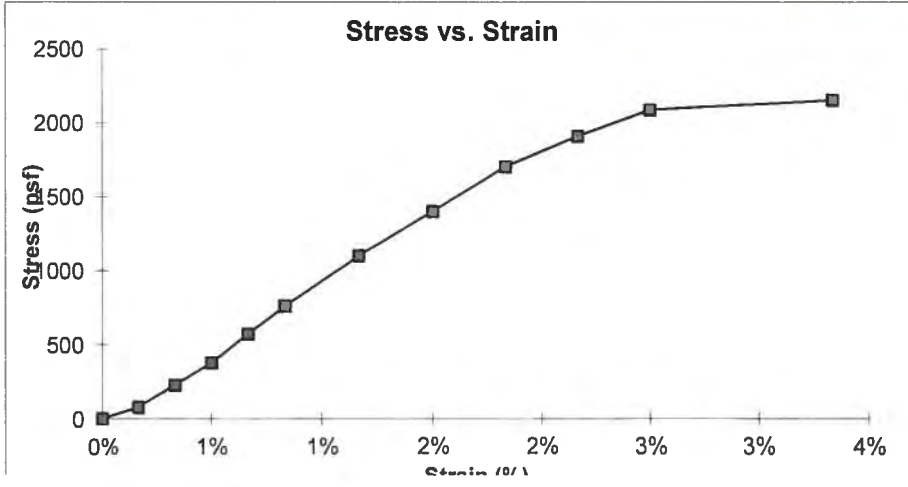
KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

#886

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

| | | | |
|--------------------------------------|-----------------------------|--|------------------|
| Operator: CHRIS | Date: '8-13-13 | Initial Diameter | Initial Height |
| County: HOPKINS | Hole: 21 | 1.) 2.87 in. | 1.) 6 in. |
| Sample: 1 | Depth (ft.): '2.3-4.3 | 2.) 2.87 in. | 2.) 6 in. |
| Station: 1010+00 35LT | | 3.) 2.87 in. | 3.) 6 in. |
| Proj #: R-042-2013 | | Avg.: 2.870 in. | Avg.: 6.000 in. |
| VISUAL DESC: BRW & GREY SILT | | Avg.: 72.898 mm | Avg.: 152.400 mm |
| Machine #: 90 | Load Ring #: A1-506 | Initial Weight: 1243.5 g | |
| PP/Torvane | Time to Failure (min): 1.50 | Initial Area: 6.47 in ² | |
| 1.) 4 | | Initial Volume: 38.82 in ³ | |
| 2.) 4 | | Can #: 9 | |
| 3.) 4 | | Tare: 45.4 | |
| Average: 4.0 | | Wet + Tare: 61.1 | |
| Max. Stress (psi): 14.95 | Strain (%): 3.33% | Dry + Tare: 58.1 | |
| Max. Stress (psf): 2153.05 | | Moisture (%): 23.6 | |
| Limiting Stress @ 10 % Strain (psf): | | Wet Density (pcf): 121.9 | |
| Max. Stress (kPa): 103.09 | | Wet Density (kg/m ³): 1953 | |
| Limiting Stress @ 10 % Strain (kPa): | | | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0012 | | | 6.48 | 0.54 | 78.48 | 0.17% |
| 0.020 | 0.0035 | | | 6.49 | 1.59 | 228.52 | 0.33% |
| 0.030 | 0.0058 | | | 6.50 | 2.63 | 378.05 | 0.50% |
| 0.040 | 0.0088 | | | 6.51 | 3.98 | 572.63 | 0.67% |
| 0.050 | 0.0117 | | | 6.52 | 5.28 | 760.06 | 0.83% |
| 0.070 | 0.0170 | | | 6.55 | 7.64 | 1100.66 | 1.17% |
| 0.090 | 0.0217 | | | 6.57 | 9.72 | 1400.22 | 1.50% |
| 0.110 | 0.0265 | | | 6.59 | 11.83 | 1704.15 | 1.83% |
| 0.130 | 0.0298 | | | 6.61 | 13.26 | 1909.86 | 2.17% |
| 0.150 | 0.0327 | | | 6.64 | 14.50 | 2088.58 | 2.50% |
| 0.200 | 0.0340 | | | 6.69 | 14.95 | 2153.05 | 3.33% |
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Failure Sketch:

Remarks:

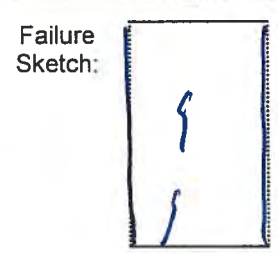
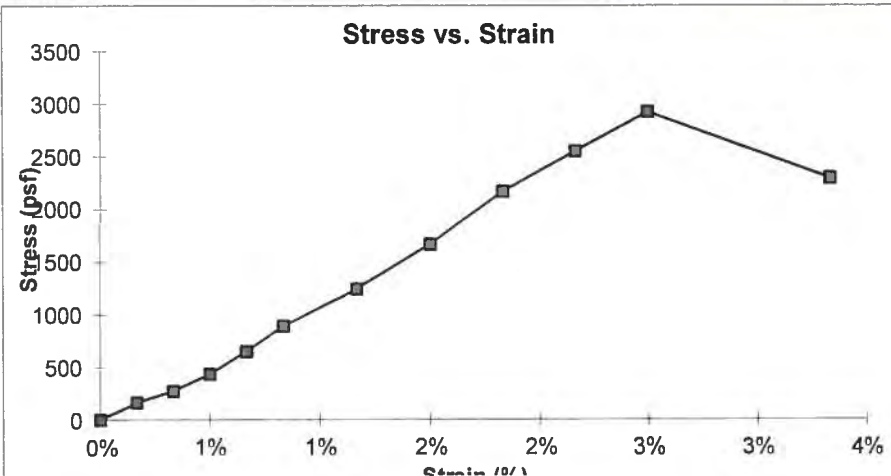
KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

#887

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

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|---|------------------------------------|-------------------------|------------------------|-----------------|------------------|-----------------------------|------------------------------|--|----------------------------|--|---|--|----------------------|----------------------------|------------|------------------------------------|----------------|--|----------------|--|----------------|--|---------------------|--|---------------------------------|--------------------------|-----------------------------------|--|--|--|----------------------------------|--|--|--|--|------------------|--|----------------|--|---------------------|--|------------------|--|---------------------|--|------------------|--|---------------------|--|------------------|--|------------------------|--|------------------------|--|------------------------|--|-------------------------|--|---------------------------------|--|--|--|---|--|--|--|--|--|--|--|------------------|--|--|--|-------------------|--|--|--|-------------------------|--|--|--|-------------------------|--|--|--|---------------------------|--|--|--|---------------------------------|--|--|--|---|--|--|--|
| <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Operator: <u>CHRIS</u></td> <td style="width: 50%;">Date: <u>8-13-13</u></td> </tr> <tr> <td>County: <u>HOPKINS</u></td> <td>Hole: <u>23</u></td> </tr> <tr> <td>Sample: <u>1</u></td> <td>Depth (ft.): <u>2.3-4.3</u></td> </tr> <tr> <td colspan="2">Station: <u>1030+00 35RT</u></td> </tr> <tr> <td colspan="2">Proj. #: <u>R-042-2013</u></td> </tr> <tr> <td colspan="2">VISUAL DESC: <u>BRW & GREY SILTY CLAY</u></td> </tr> <tr> <td>Machine #: <u>90</u></td> <td>Load Ring #: <u>A1-506</u></td> </tr> <tr> <td>PP/Torvane</td> <td>Time to Failure (min): <u>1.50</u></td> </tr> <tr> <td>1.) <u>3.5</u></td> <td></td> </tr> <tr> <td>2.) <u>3.5</u></td> <td></td> </tr> <tr> <td>3.) <u>3.5</u></td> <td></td> </tr> <tr> <td>Average: <u>3.5</u></td> <td></td> </tr> <tr> <td>Max. Stress (psi): <u>20.31</u></td> <td>Strain (%): <u>2.50%</u></td> </tr> <tr> <td>Max. Stress (psf): <u>2925.29</u></td> <td></td> </tr> <tr> <td colspan="2">Limiting Stress @ 10 % Strain (psf): <u> </u></td> </tr> <tr> <td>Max. Stress (kPa): <u>140.06</u></td> <td></td> </tr> <tr> <td colspan="2">Limiting Stress @ 10 % Strain (kPa): <u> </u></td> </tr> </table> | Operator: <u>CHRIS</u> | Date: <u>8-13-13</u> | County: <u>HOPKINS</u> | Hole: <u>23</u> | Sample: <u>1</u> | Depth (ft.): <u>2.3-4.3</u> | Station: <u>1030+00 35RT</u> | | Proj. #: <u>R-042-2013</u> | | VISUAL DESC: <u>BRW & GREY SILTY CLAY</u> | | Machine #: <u>90</u> | Load Ring #: <u>A1-506</u> | PP/Torvane | Time to Failure (min): <u>1.50</u> | 1.) <u>3.5</u> | | 2.) <u>3.5</u> | | 3.) <u>3.5</u> | | Average: <u>3.5</u> | | Max. Stress (psi): <u>20.31</u> | Strain (%): <u>2.50%</u> | Max. Stress (psf): <u>2925.29</u> | | Limiting Stress @ 10 % Strain (psf): <u> </u> | | Max. Stress (kPa): <u>140.06</u> | | Limiting Stress @ 10 % Strain (kPa): <u> </u> | | <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Initial Diameter</td> <td colspan="2">Initial Height</td> </tr> <tr> <td>1.) <u>2.87</u> in.</td> <td></td> <td>1.) <u>6</u> in.</td> <td></td> </tr> <tr> <td>2.) <u>2.87</u> in.</td> <td></td> <td>2.) <u>6</u> in.</td> <td></td> </tr> <tr> <td>3.) <u>2.87</u> in.</td> <td></td> <td>3.) <u>6</u> in.</td> <td></td> </tr> <tr> <td>Avg.: <u>2.870</u> in.</td> <td></td> <td>Avg.: <u>6.000</u> in.</td> <td></td> </tr> <tr> <td>Avg.: <u>72.898</u> mm</td> <td></td> <td>Avg.: <u>152.400</u> mm</td> <td></td> </tr> <tr> <td colspan="2">Initial Weight: <u>1271.9</u> g</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Initial Area: <u>6.47</u> in²</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">Initial Volume: <u>38.82</u> in³</td> <td colspan="2"></td> </tr> <tr> <td colspan="4">Can #: <u>19</u></td> </tr> <tr> <td colspan="4">Tare: <u>45.3</u></td> </tr> <tr> <td colspan="4">Wet + Tare: <u>58.7</u></td> </tr> <tr> <td colspan="4">Dry + Tare: <u>56.4</u></td> </tr> <tr> <td colspan="4">Moisture (%): <u>20.7</u></td> </tr> <tr> <td colspan="4">Wet Density (pcf): <u>124.7</u></td> </tr> <tr> <td colspan="4">Wet Density (kg/m³): <u>1998</u></td> </tr> </table> | Initial Diameter | | Initial Height | | 1.) <u>2.87</u> in. | | 1.) <u>6</u> in. | | 2.) <u>2.87</u> in. | | 2.) <u>6</u> in. | | 3.) <u>2.87</u> in. | | 3.) <u>6</u> in. | | Avg.: <u>2.870</u> in. | | Avg.: <u>6.000</u> in. | | Avg.: <u>72.898</u> mm | | Avg.: <u>152.400</u> mm | | Initial Weight: <u>1271.9</u> g | | | | Initial Area: <u>6.47</u> in ² | | | | Initial Volume: <u>38.82</u> in ³ | | | | Can #: <u>19</u> | | | | Tare: <u>45.3</u> | | | | Wet + Tare: <u>58.7</u> | | | | Dry + Tare: <u>56.4</u> | | | | Moisture (%): <u>20.7</u> | | | | Wet Density (pcf): <u>124.7</u> | | | | Wet Density (kg/m ³): <u>1998</u> | | | |
| Operator: <u>CHRIS</u> | Date: <u>8-13-13</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| County: <u>HOPKINS</u> | Hole: <u>23</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sample: <u>1</u> | Depth (ft.): <u>2.3-4.3</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station: <u>1030+00 35RT</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Proj. #: <u>R-042-2013</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VISUAL DESC: <u>BRW & GREY SILTY CLAY</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Machine #: <u>90</u> | Load Ring #: <u>A1-506</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PP/Torvane | Time to Failure (min): <u>1.50</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.) <u>3.5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.) <u>3.5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.) <u>3.5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Average: <u>3.5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. Stress (psi): <u>20.31</u> | Strain (%): <u>2.50%</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. Stress (psf): <u>2925.29</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Limiting Stress @ 10 % Strain (psf): <u> </u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. Stress (kPa): <u>140.06</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Limiting Stress @ 10 % Strain (kPa): <u> </u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Initial Diameter | | Initial Height | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.) <u>2.87</u> in. | | 1.) <u>6</u> in. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.) <u>2.87</u> in. | | 2.) <u>6</u> in. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.) <u>2.87</u> in. | | 3.) <u>6</u> in. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Avg.: <u>2.870</u> in. | | Avg.: <u>6.000</u> in. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Avg.: <u>72.898</u> mm | | Avg.: <u>152.400</u> mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Initial Weight: <u>1271.9</u> g | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Initial Area: <u>6.47</u> in ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Initial Volume: <u>38.82</u> in ³ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Can #: <u>19</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tare: <u>45.3</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wet + Tare: <u>58.7</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dry + Tare: <u>56.4</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture (%): <u>20.7</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wet Density (pcf): <u>124.7</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wet Density (kg/m ³): <u>1998</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0025 | | | 6.48 | 1.14 | 163.50 | 0.17% |
| 0.020 | 0.0042 | | | 6.49 | 1.90 | 274.22 | 0.33% |
| 0.030 | 0.0067 | | | 6.50 | 3.03 | 436.71 | 0.50% |
| 0.040 | 0.0100 | | | 6.51 | 4.52 | 650.72 | 0.67% |
| 0.050 | 0.0137 | | | 6.52 | 6.18 | 889.99 | 0.83% |
| 0.070 | 0.0192 | | | 6.55 | 8.63 | 1243.09 | 1.17% |
| 0.090 | 0.0258 | | | 6.57 | 11.56 | 1664.77 | 1.50% |
| 0.110 | 0.0337 | | | 6.59 | 15.05 | 2167.17 | 1.83% |
| 0.130 | 0.0398 | | | 6.61 | 17.71 | 2550.76 | 2.17% |
| 0.150 | 0.0458 | | | 6.64 | 20.31 | 2925.29 | 2.50% |
| 0.200 | 0.0362 | | | 6.69 | 15.92 | 2292.37 | 3.33% |
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Remarks:

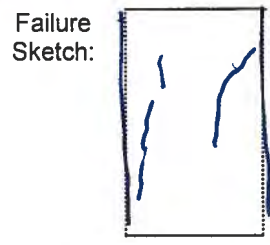
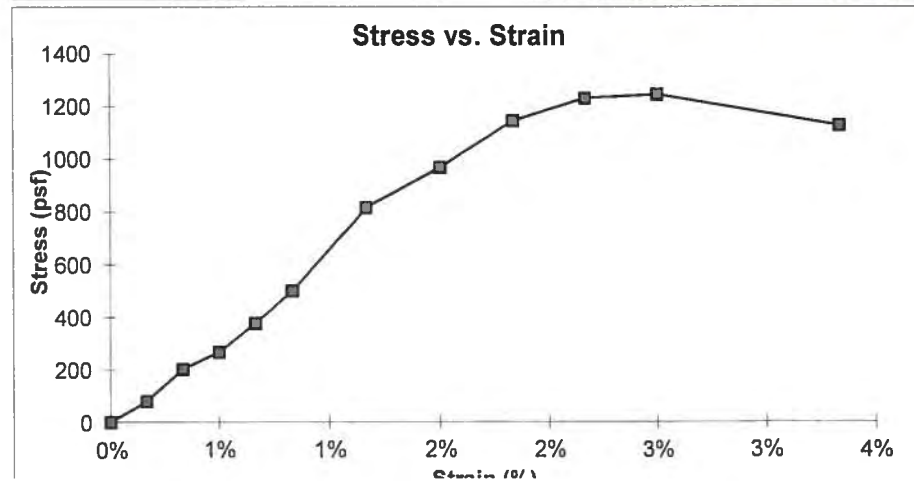
KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

#889

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

| | | | |
|--|---|---|---|
| Operator: CHRIS County: HOPKINS Sample: 1 Station: 1037+00 70LT Proj. #: R-042-2013 VISUAL DESC: BRW SILT | Date: 8-13-13 Hole: 1 Depth (ft.): 3-5 | Initial Diameter 1.) 2.87 in. 2.) 2.87 in. 3.) 2.87 in. Avg.: 2.870 in. Avg.: 72.898 mm | Initial Height 1.) 6 in. 2.) 6 in. 3.) 6 in. Avg.: 6.000 in. Avg.: 152.400 mm |
| Machine #: 90 PP/Torvane | Load Ring #: A1-506 Time to Failure (min): 1.50 | Initial Weight: 1245 g Initial Area: 6.47 in ² Initial Volume: 38.82 in ³ | |
| 1.) 4.5 2.) 4.5 3.) 4.5 Average: 4.5 | | Can #: 4 Tare: 45.6 Wet + Tare: 67 Dry + Tare: 63.2 Moisture (%): 21.6 Wet Density (pcf): 122.1 Wet Density (kg/m³): 1956 | |
| Max. Stress (psi): 8.65 Max. Stress (psf): 1245.48 Limiting Stress @ 10 % Strain (psf): | Strain (%): 2.50% | | |
| Max. Stress (kPa): 59.63 Limiting Stress @ 10 % Strain (kPa): | | | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0012 | | | 6.48 | 0.54 | 78.48 | 0.17% |
| 0.020 | 0.0031 | | | 6.49 | 1.41 | 202.40 | 0.33% |
| 0.030 | 0.0041 | | | 6.50 | 1.86 | 267.24 | 0.50% |
| 0.040 | 0.0058 | | | 6.51 | 2.62 | 377.42 | 0.67% |
| 0.050 | 0.0077 | | | 6.52 | 3.47 | 500.21 | 0.83% |
| 0.070 | 0.0126 | | | 6.55 | 5.67 | 815.78 | 1.17% |
| 0.090 | 0.0150 | | | 6.57 | 6.72 | 967.89 | 1.50% |
| 0.110 | 0.0178 | | | 6.59 | 7.95 | 1144.68 | 1.83% |
| 0.130 | 0.0192 | | | 6.61 | 8.55 | 1230.52 | 2.17% |
| 0.150 | 0.0195 | | | 6.64 | 8.65 | 1245.48 | 2.50% |
| 0.200 | 0.0178 | | | 6.69 | 7.83 | 1127.19 | 3.33% |
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Remarks:

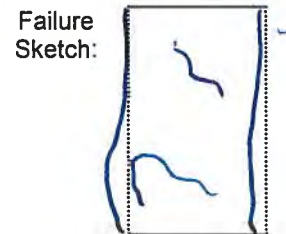
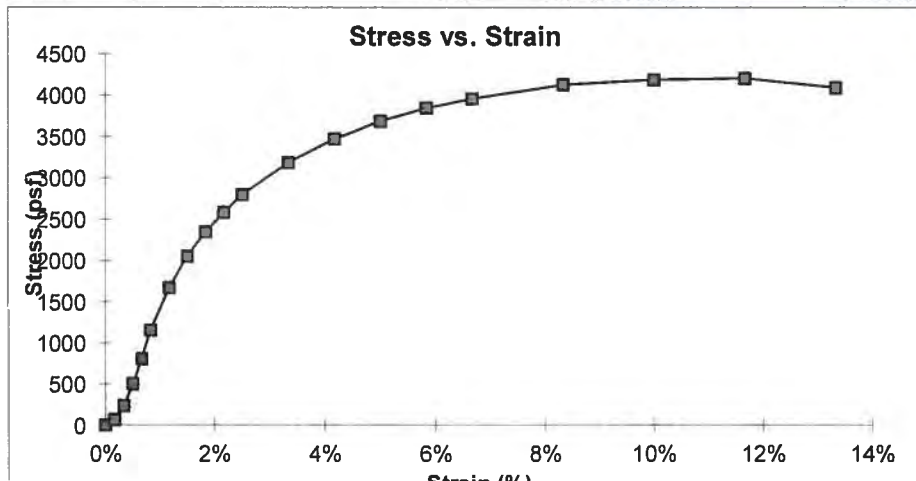
KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

893

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

| | |
|---|--|
| Operator: <u>CHRIS</u> Date: <u>'8-13-13</u> County: <u>HOPKINS</u> Hole: <u>27</u> Sample: <u>1</u> Depth (ft.): <u>'2.5-4.5</u> Station: <u>1095+00 35LT</u> Proj. #: <u>R-042-2013</u> VISUAL DESC: <u>BRW & RED CLAY</u> | Initial Diameter Initial Height 1.) <u>2.87</u> in. 1.) <u>6</u> in. 2.) <u>2.87</u> in. 2.) <u>6</u> in. 3.) <u>2.87</u> in. 3.) <u>6</u> in. Avg.: <u>2.870</u> in. Avg.: <u>6.000</u> in. Avg.: <u>72.898</u> mm Avg.: <u>152.400</u> mm Initial Weight: <u>1301.7</u> g Initial Area: <u>6.47</u> in ² Initial Volume: <u>38.82</u> in ³ |
| Machine #: <u>90</u> Load Ring #: <u>A1-506</u> PP/Torvane Time to Failure (min): <u>6.00</u> 1.) <u>4.5</u> 2.) <u>4.5</u> 3.) <u>4.5</u> Average: <u>4.5</u> | Can #: <u>10</u> Tare: <u>45.4</u> Wet + Tare: <u>65.6</u> Dry + Tare: <u>62.6</u> Moisture (%): <u>17.4</u> Wet Density (pcf): <u>127.6</u> Wet Density (kg/m ³): <u>2045</u> |
| Max. Stress (psi): <u>29.17</u> Strain (%): <u>11.67%</u> Max. Stress (psf): <u>4201.07</u> Limiting Stress @ 10 % Strain (psf): <u>4186</u> Max. Stress (kPa): <u>201.15</u> Limiting Stress @ 10 % Strain (kPa): <u>200</u> | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0010 | | | 6.48 | 0.45 | 65.40 | 0.17% |
| 0.020 | 0.0036 | | | 6.49 | 1.63 | 235.05 | 0.33% |
| 0.030 | 0.0077 | | | 6.50 | 3.49 | 501.90 | 0.50% |
| 0.040 | 0.0124 | | | 6.51 | 5.60 | 806.89 | 0.67% |
| 0.050 | 0.0178 | | | 6.52 | 8.03 | 1156.34 | 0.83% |
| 0.070 | 0.0258 | | | 6.55 | 11.60 | 1670.41 | 1.17% |
| 0.090 | 0.0318 | | | 6.57 | 14.25 | 2051.93 | 1.50% |
| 0.110 | 0.0365 | | | 6.59 | 16.30 | 2347.23 | 1.83% |
| 0.130 | 0.0403 | | | 6.61 | 17.94 | 2582.80 | 2.17% |
| 0.150 | 0.0438 | | | 6.64 | 19.43 | 2797.55 | 2.50% |
| 0.200 | 0.0503 | | | 6.69 | 22.12 | 3185.25 | 3.33% |
| 0.250 | 0.0553 | | | 6.75 | 24.11 | 3471.69 | 4.17% |
| 0.300 | 0.0592 | | | 6.81 | 25.58 | 3684.21 | 5.00% |
| 0.350 | 0.0623 | | | 6.87 | 26.69 | 3843.12 | 5.83% |
| 0.400 | 0.0647 | | | 6.93 | 27.47 | 3955.85 | 6.67% |
| 0.500 | 0.0687 | | | 7.06 | 28.65 | 4125.41 | 8.33% |
| 0.600 | 0.0710 | | | 7.19 | 29.07 | 4186.01 | 10.00% |
| 0.700 | 0.0726 | | | 7.32 | 29.17 | 4201.07 | 11.67% |
| 0.800 | 0.0720 | | | 7.46 | 28.39 | 4087.74 | 13.33% |



Remarks:

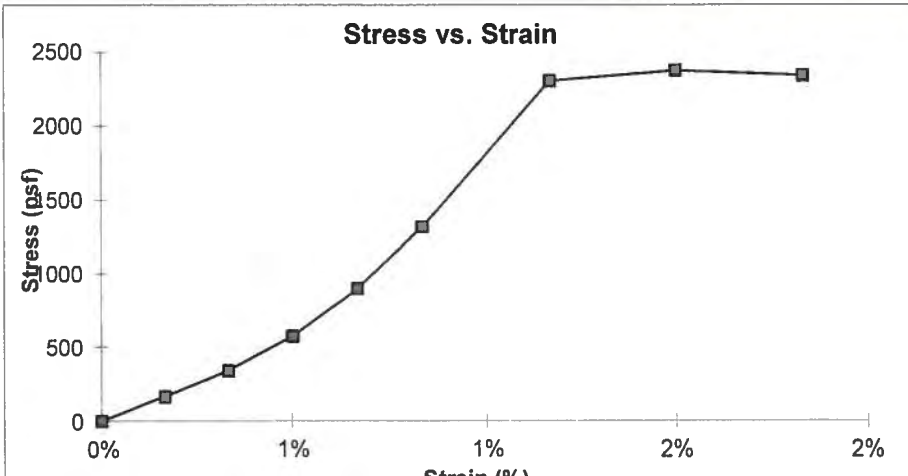
KENTUCKY TRANSPORTATION CABINET
 Division of Structural Design, Geotechnical Branch
 1236 Wilkinson Blvd.
 Frankfort, KY 40601

898

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

| | |
|---|--|
| Operator: <u>CHRIS</u> Date: <u>'8-13-13</u> County: <u>HOPKINS</u> Hole: <u>1006</u> Sample: <u>1</u> Depth (ft.): <u>'3-5</u> Station: <u>9217+25 12LT</u> Proj. #: <u>R-042-2013</u> VISUAL DESC: <u>BRW SILTY CLAY W/ROCK</u> | Initial Diameter Initial Height 1.) <u>2.87</u> in. 1.) <u>6</u> in. 2.) <u>2.87</u> in. 2.) <u>6</u> in. 3.) <u>2.87</u> in. 3.) <u>6</u> in. Avg.: <u>2.870</u> in. Avg.: <u>6.000</u> in. Avg.: <u>72.898</u> mm Avg.: <u>152.400</u> mm Initial Weight: <u>1234.3</u> g Initial Area: <u>6.47</u> in ² Initial Volume: <u>38.82</u> in ³ |
| Machine #: <u>90</u> Load Ring #: <u>A1-506</u> PP/Torvane Time to Failure (min): <u>1.00</u> 1.) <u>4.5</u> 2.) <u>4.5</u> 3.) <u>4.5</u> Average: <u>4.5</u> | Can #: <u>7</u> Tare: <u>45.7</u> Wet + Tare: <u>71.5</u> Dry + Tare: <u>66.6</u> Moisture (%): <u>23.4</u> Wet Density (pcf): <u>121.0</u> Wet Density (kg/m ³): <u>1939</u> |
| Max. Stress (psi): <u>16.49</u> Strain (%): <u>1.50%</u> Max. Stress (psf): <u>2374.56</u> Limiting Stress @ 10 % Strain (psf): <u> </u> Max. Stress (kPa): <u>113.69</u> Limiting Stress @ 10 % Strain (kPa): <u> </u> | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0025 | | | 6.48 | 1.14 | 163.50 | 0.17% |
| 0.020 | 0.0052 | | | 6.49 | 2.36 | 339.51 | 0.33% |
| 0.030 | 0.0088 | | | 6.50 | 3.98 | 573.59 | 0.50% |
| 0.040 | 0.0138 | | | 6.51 | 6.24 | 897.99 | 0.67% |
| 0.050 | 0.0203 | | | 6.52 | 9.16 | 1318.75 | 0.83% |
| 0.070 | 0.0356 | | | 6.55 | 16.01 | 2304.90 | 1.17% |
| 0.090 | 0.0368 | | | 6.57 | 16.49 | 2374.56 | 1.50% |
| 0.110 | 0.0364 | | | 6.59 | 16.26 | 2340.80 | 1.83% |
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Failure Sketch:

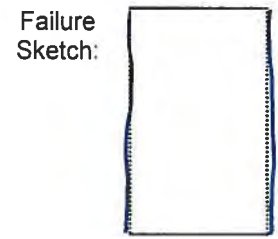
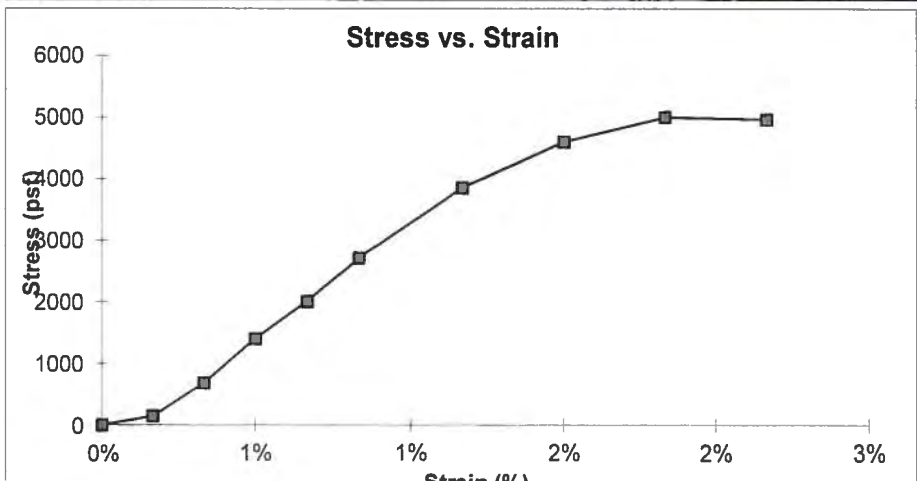
Remarks:

#900

Tested by: CHRIS GROVES
 Technical Responsibility: ERIK SCOTT
 Unconfined Compression Test, AASHTO T 208-05

| | | | |
|---|------------------------------------|--|-----------------------|
| Operator: CHRIS | Date: '8-13-13 | Initial Diameter | Initial Height |
| County: HOPKINS | Hole: 1001 | 1.) 2.87 in. | 1.) 6 in. |
| Sample: 1 | Depth (ft.): '3-5 | 2.) 2.87 in. | 2.) 6 in. |
| Station: 9620+25 12LT | | 3.) 2.87 in. | 3.) 6 in. |
| Proj. #: R-042-2013 | | Avg.: 2.870 in. | Avg.: 6.000 in. |
| VISUAL DESC: BRW SILT W/SHALE | | Avg.: 72.898 mm | Avg.: 152.400 mm |
| Machine #: 90 | Load Ring #: A1-506 | Initial Weight: 1269.6 g | |
| PP/Torvane | Time to Failure (min): 1.50 | Initial Area: 6.47 in ² | |
| 1.) 3.5 | | Initial Volume: 38.82 in ³ | |
| 2.) 3.5 | | Can #: 6 | |
| 3.) 3.5 | | Tare: 45.6 | |
| Average: 3.5 | | Wet + Tare: 66.7 | |
| Max. Stress (psi): 34.74 | Strain (%): 1.83% | Dry + Tare: 62.1 | |
| Max. Stress (psf): 5003.14 | | Moisture (%): 27.9 | |
| Limiting Stress @ 10 % Strain (psf): | | Wet Density (pcf): 124.5 | |
| Max. Stress (kPa): 239.55 | | Wet Density (kg/m³): 1994 | |
| Limiting Stress @ 10 % Strain (kPa): | | | |

| Deflection (in) | Load Ring Defl (in) | Elapsed Time (mm:ss.00) | Elapsed Time (min.) | Adj. Area (in ²) | Stress (psi) | Stress (psf) | Strain (%) |
|-----------------|---------------------|-------------------------|---------------------|------------------------------|--------------|--------------|------------|
| 0.000 | 0.0000 | | | 6.47 | 0.00 | 0.00 | 0.00% |
| 0.010 | 0.0022 | | | 6.48 | 1.00 | 143.88 | 0.17% |
| 0.020 | 0.0105 | | | 6.49 | 4.76 | 685.55 | 0.33% |
| 0.030 | 0.0215 | | | 6.50 | 9.73 | 1401.40 | 0.50% |
| 0.040 | 0.0308 | | | 6.51 | 13.92 | 2004.22 | 0.67% |
| 0.050 | 0.0418 | | | 6.52 | 18.86 | 2715.45 | 0.83% |
| 0.070 | 0.0596 | | | 6.55 | 26.80 | 3858.77 | 1.17% |
| 0.090 | 0.0714 | | | 6.57 | 31.99 | 4607.16 | 1.50% |
| 0.110 | 0.0778 | | | 6.59 | 34.74 | 5003.14 | 1.83% |
| 0.130 | 0.0775 | | | 6.61 | 34.49 | 4966.93 | 2.17% |
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Remarks:

COORDINATE DATA SUBMISSION FORM
KYTC DIVISION OF STRUCTURAL DESIGN -- GEOTECHNICAL BRANCH

County Hopkins

Date 7/2/2013

Road Number I-69

Survey Crew / Consultant Kelly Whittington

Contact Person Stephen Sewell

Item # 2-225.00

Mars # _____

Project # _____

Notes:

(circle one)

Elevation Datum **NAVD88** **Assumed**

| HOLE NUMBER | LATITUDE (Decimal Degrees) | LONGITUDE (Decimal Degrees) | HOLE NUMBER | STATION | OFFSET | ELEVATION (ft) |
|-------------|-------------------------------|--------------------------------|-------------|-------------------|---------|----------------|
| 1 | 37.21284944 | 87.45039955 | 1 | 1037+00 | 70' LT | 478.63 |
| 2 | 37.21563392 | 87.4442766 | 2 | 1058+00 | 80' RT | 484.47 |
| 3 | 37.21714798 | 87.44332534 | 3 | 1064+00 | 80' RT | 465.38 |
| 4 | 37.2275516 | 87.44432589 | 4 | 1102+00 | 105' RT | 465.39 |
| 5 | 37.21222403 | 87.45080345 | 5 | 3008+00 RAMP J | 20' RT | 475.48 |
| 6 | 37.22106653 | 87.44393089 | 6 | 2044+30 ML SB | 4' RT | 434.22 |
| 7 | 37.21277061 | 87.45172838 | 7 | 1033+00 | 80' LT | 466.52 |
| 8 | 37.21282057 | 87.45073209 | 8 | 1036+00 | 75' LT | 476.72 |
| 9 | 37.2129906 | 87.44975579 | 9 | 1039+00 | 80' LT | 477.93 |
| 10 | 37.21303129 | 87.44870709 | 10 | 1042+00 | CL | 466.26 |
| 11 | 37.21342358 | 87.44818108 | 11 | 1044+00 | 70' LT | 458.77 |
| 12 | 37.21400267 | 87.44621101 | 12 | 1050+00 | 60' RT | 438.05 |
| 13 | 37.21509695 | 87.44512456 | 13 | 1055+00 | CL | 459.99 |
| 14 | 37.21575443 | 87.44450694 | 14 | 1058+00 | CL | 481.76 |
| 15 | 37.21656695 | 87.44423931 | 15 | 1061+00 | 80' LT | 454.08 |
| HOLE NUMBER | LATITUDE (Decimal Degrees) | LONGITUDE (Decimal Degrees) | HOLE NUMBER | STATION | OFFSET | ELEVATION (ft) |
| 16 | 37.2174185 | 87.44321584 | 16 | 1065+00 | 80' RT | 456.93 |
| 17 | 37.22132144 | 87.44301766 | 17 | 1079+00 | 80' RT | 424.88 |
| 18 | 37.22268302 | 87.44325266 | 18 | 1084+00 | 100' RT | 418.86 |

APPENDIX H

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

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

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) 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;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

APPENDIX I

**Traffic Forecast Business Report
Hopkins County Traffic Forecast
I-69 Corridor: Western Kentucky Parkway /
Pennyrile Parkway Interchange
Item No. 02-225.00**

FINAL REPORT

Prepared for:

Kentucky Transportation Cabinet (KYTC)



Prepared by:

**PARSONS
BRINCKERHOFF**

February 2013

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Appendices

Appendix A: ESAL Forecasts

Commonly Used Abbreviations and their Descriptions

| | | |
|----------|--------------------------------|--|
| ADT | Average Daily Traffic | Without any adjustment |
| DHV | Design Hour Volume | 30 th highest hour of a <u>year</u> |
| ESAL | Equivalent Single Axle Load | A measure of traffic's impact on roadway |
| %T | Truck Percentage | The percentage of trucks to total volume |
| FC | Functional Class | Refers to a road's importance |
| GR | Growth Rate | A value normally compounded annually |
| PHF | Peak Hour Factor | Considers a 15 minute spike in an hourly count |
| K-Factor | K-30 th Hour Factor | DHV divided by ADT (DHV/ADT) |
| D-Factor | Directional Factor | Percentage of dominant flow to total |
| MP | Mile Point | Miles increase easterly and northerly |
| ATR | Automatic Traffic Recorder | A permanent and continuous recording station |
| KYSTM | Kentucky Statewide Model | A computerized representation of KY roads |

1.0 INTRODUCTION

The purpose of this document is to summarize the steps undertaken by Parsons Brinckerhoff to prepare traffic forecasts for the Wendell H. Ford (Western Kentucky) Parkway and the Edward T. Breathitt (Pennyrile) Parkway Interchange in Hopkins County, Kentucky for the Kentucky Transportation Cabinet (KYTC). These forecasts were requested for use in the re-designation of portions of these parkways to I-69.

The study area encompasses the full interchange (including all ramps) of the existing Western Kentucky Parkway (WKP) and the Pennyrile Parkway in Hopkins County, Kentucky. **Figure 1** shows the study area.

Please note that this forecast is being performed concurrently with the forecast for the Pennyrile Parkway (Item No. 2-232.00 & 2-235.00). That forecast is also being conducted by Parsons Brinckerhoff for KYTC. Consistency is a consideration between both forecasts.

The types of forecasts included in this report are as follows:

- Average Daily Traffic (ADT) and Design Hourly Volume (DHV) forecasts for base year 2013, interim year 2020, and future design year of 2040
- ESAL forecasts and truck percentages for the future year 2040

2.0 SEGMENT TRAFFIC VOLUMES

The ADT volumes used for this project included traffic counts provided by the KYTC as well as counts conducted for this study. The counts provided by the KYTC were conducted between 2011 and 2012, and included the following count stations:

- Western Kentucky Parkway: Station 603 – 2011 ADT = 10,400
- Western Kentucky Parkway: Station 558 – 2011 ADT = 13,300
- Pennyrile Parkway: Station 262 – 2011 ADT = 14,200
- Pennyrile Parkway: Station 260 – 2012 ADT = 23,300

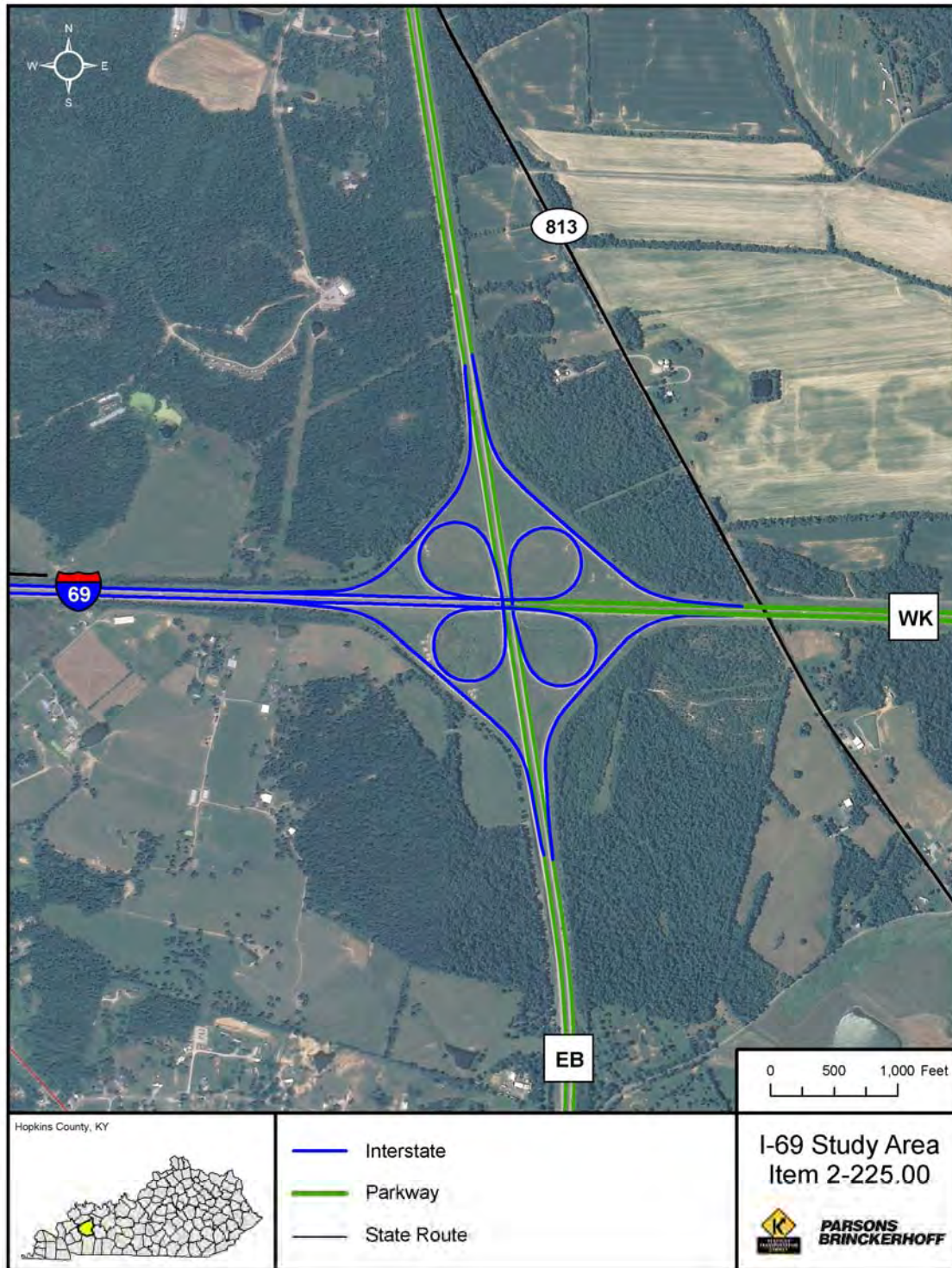
Where appropriate, the counts were forecasted to a base year of 2013 using historical trends, which will be discussed later in the report.

New 48-hour road tube counts were conducted for each of the interchange ramps. The counts were conducted in 15-minute intervals to obtain peak hour factors if necessary.

For the northernmost segment of the Pennyrile Parkway, ADT volumes for 2013 were provided through the recently completed traffic forecast for the Breathitt Parkway Interchange with KY 813, Item No. 2-8633.00¹. It was decided through telephone conversation with the KYTC Division of Planning on February 14, 2013 that given the recent completion and acceptance of this forecast by the Cabinet, traffic volumes on this overlapping segment would be maintained as the same for the current year to provide consistency.

¹ Hopkins County, Breathitt Parkway Interchange with KY 813, Item No. 2-8633.00, February 2012

Figure 1: Study Area



3.0 INTERSECTION TURNING MOVEMENT VOLUMES

All of the ramps are free flowing movements; therefore, no turning movement counts were required for this forecast.

4.0 GROWTH RATES

Growth rates for this study were based on multiple sources:

- Historical traffic growth analysis
- Population trends and projections
- Previous planning / forecasting studies

Historical growth rates for this study were based upon traffic growth analysis within the study area. The analysis utilized traffic counts obtained from the KYTC's 'CTS' traffic count program which includes counts from 1963 to 2011. A spreadsheet was developed which analyzes growth trends based on linear and exponential equations. The growth rates are averaged in the spreadsheet for each count station. Based on this data, the growth rates identified for each segment within the study area are shown in **Table 1**.

Table 1: Proposed Growth Rates

| KYTC Count Station | Route | From | To | Historical Growth Rate | Proposed Growth Rate |
|--------------------|----------------|------------------|----------------|------------------------|----------------------|
| 260 | Pennyrile Pkwy | WKP | KY 813 | 5.7% | 1.5% |
| 262 | Pennyrile Pkwy | US 62 | WKP | -0.5% | 1.5% |
| 558 | WKP | Muhlenberg Co | Pennyrile Pkwy | 4.2% | 1.5% |
| 603 | WKP | KY 109 Underpass | Pennyrile Pkwy | 3.8% | 1.5% |

As shown, the historical growth rates around the interchange have ranged from -0.5 percent to 5.7 percent per year. For this interchange, a 1.5 percent per year growth rate is proposed. This is consistent with the low population growth projected for the county as well as recent traffic forecasts prepared for individual interchanges in the nearby study area / counties. Further discussion regarding the selection of the growth rate can be found in the Traffic Forecast Methodology Report as submitted to the KYTC Division of Planning.

Tables 2 - 4 on the following pages show the 2013, 2020 and 2040 traffic forecasted volumes. Figure 2 shows segment descriptions and provide a summary of the final traffic forecasts for key study area segments and ramps prepared for this study. It should be noted that these are directional volumes as indicated by the segment letter / number.

As noted in the Segment Volumes discussion section, DHV values were maintained for the year 2013 as the same compared to the recent traffic forecast for the interchange to the north (Breathitt Parkway Interchange with KY 813). The same volumes are also carried forward in the traffic forecast for Item Nos. 2-232.00 & 2-235.00 for consistency. The future years vary slightly as the growth rate applied to this interchange (1.5%) is slightly less than that used for the traffic forecast for the interchange to the north (2.0%).

Table 2: 2013 Traffic Forecast Summary

| SEGMENT | ROUTE | BEGINNING DESCRIPTION | ENDING DESCRIPTION | 2013 ADT | 2013 Truck % ADT | 2013 Trucks (Daily) | 2013 AM K Factor | 2013 PM K Factor | 2013 AM DHV | 2013 PM DHV | 2013 Truck % DHV | 2013 Trucks (DHV) |
|---------|----------------|--------------------------------------|--------------------------------------|----------|------------------|---------------------|------------------|------------------|-------------|-------------|------------------|-------------------|
| A | WKP | East of Interchange | WKP WB Off-Ramp to NB Pennyrile Pkwy | 7,000 | 35.0% | 2,450 | 8.6% | 8.9% | 600 | 620 | 13.0% | 80 |
| E | WKP | Pennyrile Pkwy SB On-Ramp to WB WKP | West of Interchange | 5,400 | 35.0% | 1,890 | 8.5% | 10.2% | 460 | 550 | 13.0% | 70 |
| F | WKP | West of Interchange | WKP EB Off-Ramp to SB Pennyrile Pkwy | 5,400 | 35.0% | 1,890 | 9.6% | 10.8% | 520 | 580 | 13.0% | 80 |
| J | WKP | Pennyrile Pkwy NB On-Ramp to WB WKP | East of Interchange | 7,000 | 35.0% | 2,450 | 8.9% | 10.7% | 620 | 750 | 13.0% | 100 |
| K | Pennyrile Pkwy | South of Interchange | Pennyrile Pkwy NB Off-Ramp to EB WKP | 7,500 | 35.0% | 2,630 | 11.9% | 10.9% | 890 | 820 | 13.0% | 110 |
| O | Pennyrile Pkwy | WKP EB Off-Ramp to Pennyrile Pkwy | North of Interchange | 10,400 | 35.0% | 3,640 | 10.9% | 9.9% | 1,130 | 1,030 | 13.0% | 130 |
| P | Pennyrile Pkwy | North of Interchange | Pennyrile Pkwy SB Off-Ramp to WB WKP | 10,400 | 35.0% | 3,640 | 9.9% | 11.2% | 1,030 | 1,160 | 13.0% | 150 |
| T | Pennyrile Pkwy | WKP EB Off-Ramp to SB Pennyrile Pkwy | South of Interchange | 7,500 | 35.0% | 2,630 | 11.1% | 11.3% | 830 | 850 | 13.0% | 110 |
| 1 | Ramp | WKP WB | Pennyrile Pkwy NB | 2,500 | 35.0% | 880 | 8.2% | 7.7% | 210 | 190 | 13.0% | 20 |
| 2 | Ramp | Pennyrile Pkwy NB | WKP WB | 200 | 35.0% | 70 | 11.4% | 10.5% | 20 | 20 | 13.0% | 0 |
| 3 | Ramp | WKP WB | Pennyrile Pkwy SB | 1,600 | 35.0% | 560 | 7.5% | 7.1% | 120 | 110 | 13.0% | 10 |
| 4 | Ramp | Pennyrile Pkwy SB | WKP EB | 2,300 | 35.0% | 810 | 7.4% | 9.1% | 170 | 210 | 13.0% | 30 |
| 5 | Ramp | WKP EB | Pennyrile Pkwy SB | 200 | 35.0% | 70 | 8.9% | 11.8% | 20 | 20 | 13.0% | 0 |
| 6 | Ramp | Pennyrile Pkwy SB | WKP EB | 2,400 | 35.0% | 840 | 6.9% | 9.6% | 170 | 230 | 13.0% | 30 |
| 7 | Ramp | WKP EB | Pennyrile Pkwy NB | 2,300 | 35.0% | 810 | 8.2% | 8.0% | 190 | 180 | 13.0% | 20 |
| 8 | Ramp | Pennyrile Pkwy NB | WKP EB | 1,700 | 35.0% | 600 | 8.4% | 8.0% | 140 | 140 | 13.0% | 20 |

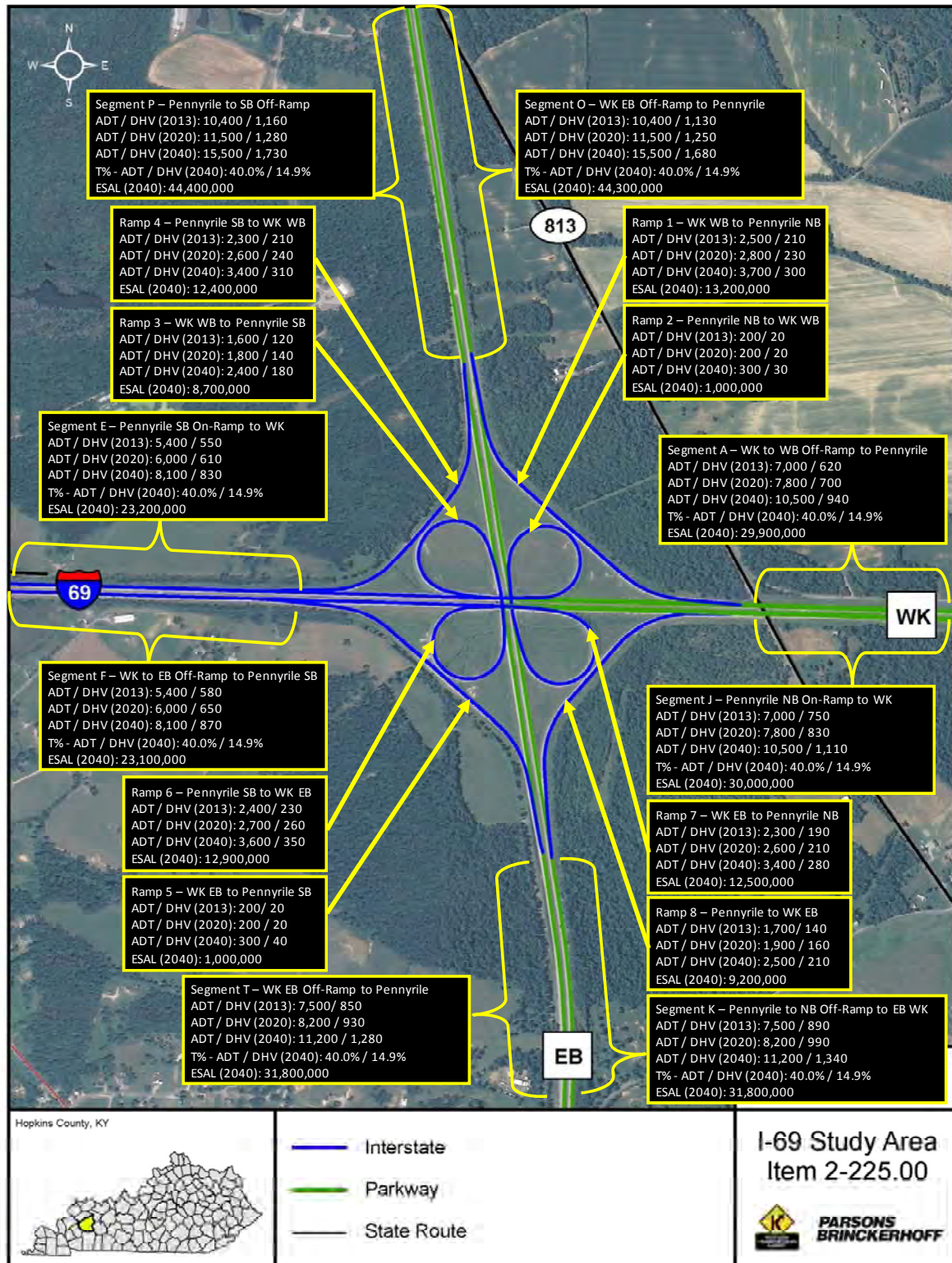
Table 3: 2020 Traffic Forecast Summary

| SEGMENT | ROUTE | BEGINNING DESCRIPTION | ENDING DESCRIPTION | GROWTH RATE | 2020 ADT | 2020 Truck % ADT | 2020 Trucks (Daily) | 2020 AM K Factor | 2020 PM K Factor | 2020 AM DHV | 2020 PM DHV | 2020 Truck % DHV | 2020 Trucks (DHV) |
|---------|----------------|--------------------------------------|--------------------------------------|-------------|----------|------------------|---------------------|------------------|------------------|-------------|-------------|------------------|-------------------|
| A | WKP | East of Interchange | WKP WB Off-Ramp to NB Pennyrile Pkwy | 1.5% | 7,800 | 36.2% | 2,830 | 8.6% | 9.0% | 670 | 700 | 13.5% | 90 |
| E | WKP | Pennyrile Pkwy SB On-Ramp to WB WKP | West of Interchange | 1.5% | 6,000 | 36.2% | 2,170 | 8.5% | 10.2% | 510 | 610 | 13.5% | 80 |
| F | WKP | West of Interchange | WKP EB Off-Ramp to SB Pennyrile Pkwy | 1.5% | 6,000 | 36.2% | 2,170 | 9.6% | 10.8% | 580 | 650 | 13.5% | 90 |
| J | WKP | Pennyrile Pkwy NB On-Ramp to WB WKP | East of Interchange | 1.5% | 7,800 | 36.2% | 2,830 | 9.0% | 10.6% | 700 | 830 | 13.5% | 110 |
| K | Pennyrile Pkwy | South of Interchange | Pennyrile Pkwy NB Off-Ramp to EB WKP | 1.5% | 8,200 | 36.2% | 2,970 | 12.1% | 10.7% | 990 | 880 | 13.5% | 120 |
| O | Pennyrile Pkwy | WKP EB Off-Ramp to Pennyrile Pkwy | North of Interchange | 1.5% | 11,500 | 36.2% | 4,170 | 10.9% | 9.9% | 1,250 | 1,140 | 13.5% | 150 |
| P | Pennyrile Pkwy | North of Interchange | Pennyrile Pkwy SB Off-Ramp to WB WKP | 1.5% | 11,500 | 36.2% | 4,170 | 9.9% | 11.2% | 1,140 | 1,280 | 13.5% | 170 |
| T | Pennyrile Pkwy | WKP EB Off-Ramp to SB Pennyrile Pkwy | South of Interchange | 1.5% | 8,200 | 36.2% | 2,970 | 11.2% | 11.3% | 920 | 930 | 13.5% | 130 |
| 1 | Ramp | WKP WB | Pennyrile Pkwy NB | 1.5% | 2,800 | 36.2% | 1,010 | 8.2% | 7.7% | 230 | 220 | 13.5% | 30 |
| 2 | Ramp | Pennyrile Pkwy NB | WKP WB | 1.5% | 200 | 36.2% | 70 | 11.4% | 10.5% | 20 | 20 | 13.5% | 0 |
| 3 | Ramp | WKP WB | Pennyrile Pkwy SB | 1.5% | 1,800 | 36.2% | 650 | 7.5% | 7.1% | 140 | 130 | 13.5% | 20 |
| 4 | Ramp | Pennyrile Pkwy SB | WKP EB | 1.5% | 2,600 | 36.2% | 940 | 7.4% | 9.1% | 190 | 240 | 13.5% | 30 |
| 5 | Ramp | WKP EB | Pennyrile Pkwy SB | 1.5% | 200 | 36.2% | 70 | 8.9% | 11.8% | 20 | 20 | 13.5% | 0 |
| 6 | Ramp | Pennyrile Pkwy SB | WKP EB | 1.5% | 2,700 | 36.2% | 980 | 6.9% | 9.6% | 190 | 260 | 13.5% | 40 |
| 7 | Ramp | WKP EB | Pennyrile Pkwy NB | 1.5% | 2,600 | 36.2% | 940 | 8.2% | 8.0% | 210 | 210 | 13.5% | 30 |
| 8 | Ramp | Pennyrile Pkwy NB | WKP EB | 1.5% | 1,900 | 36.2% | 690 | 8.4% | 8.0% | 160 | 150 | 13.5% | 20 |

Table 4: 2040 Traffic Forecast Summary

| SEGMENT | ROUTE | BEGINNING DESCRIPTION | ENDING DESCRIPTION | GROWTH RATE | 2040 ADT | 2040 Truck % ADT | 2040 Trucks (Daily) | 2040 AM K Factor | 2040 PM K Factor | 2040 AM DHV | 2040 PM DHV | 2040 Truck % DHV | 2040 Trucks (DHV) | 2040 ESALs |
|---------|----------------|--------------------------------------|--------------------------------------|-------------|----------|------------------|---------------------|------------------|------------------|-------------|-------------|------------------|-------------------|------------|
| A | WKP | East of Interchange | WKP WB Off-Ramp to NB Pennyrile Pkwy | 1.5% | 10,500 | 40.0% | 4,200 | 8.5% | 9.0% | 890 | 940 | 14.9% | 140 | 29,900,000 |
| E | WKP | Pennyrile Pkwy SB On-Ramp to WB WKP | West of Interchange | 1.5% | 8,100 | 40.0% | 3,240 | 8.5% | 10.2% | 690 | 830 | 14.9% | 120 | 23,200,000 |
| F | WKP | West of Interchange | WKP EB Off-Ramp to SB Pennyrile Pkwy | 1.5% | 8,100 | 40.0% | 3,240 | 9.6% | 10.8% | 780 | 870 | 14.9% | 130 | 23,100,000 |
| J | WKP | Pennyrile Pkwy NB On-Ramp to WB WKP | East of Interchange | 1.5% | 10,500 | 40.0% | 4,200 | 8.9% | 10.6% | 930 | 1,110 | 14.9% | 170 | 30,000,000 |
| K | Pennyrile Pkwy | South of Interchange | Pennyrile Pkwy NB Off-Ramp to EB WKP | 1.5% | 11,200 | 40.0% | 4,490 | 12.0% | 10.9% | 1,340 | 1,220 | 14.9% | 180 | 31,800,000 |
| O | Pennyrile Pkwy | WKP EB Off-Ramp to Pennyrile Pkwy | North of Interchange | 1.5% | 15,500 | 40.0% | 6,210 | 10.9% | 9.9% | 1,680 | 1,540 | 14.9% | 230 | 44,300,000 |
| P | Pennyrile Pkwy | North of Interchange | Pennyrile Pkwy SB Off-Ramp to WB WKP | 1.5% | 15,500 | 40.0% | 6,210 | 9.9% | 11.2% | 1,540 | 1,730 | 14.9% | 260 | 44,400,000 |
| T | Pennyrile Pkwy | WKP EB Off-Ramp to SB Pennyrile Pkwy | South of Interchange | 1.5% | 11,200 | 40.0% | 4,490 | 11.2% | 11.4% | 1,250 | 1,280 | 14.9% | 190 | 31,800,000 |
| 1 | Ramp | WKP WB | Pennyrile Pkwy NB | 1.5% | 3,700 | 40.0% | 1,480 | 8.2% | 7.7% | 300 | 280 | 14.9% | 40 | 13,200,000 |
| 2 | Ramp | Pennyrile Pkwy NB | WKP WB | 1.5% | 300 | 40.0% | 120 | 11.4% | 10.5% | 30 | 30 | 14.9% | 0 | 1,000,000 |
| 3 | Ramp | WKP WB | Pennyrile Pkwy SB | 1.5% | 2,400 | 40.0% | 960 | 7.5% | 7.1% | 180 | 170 | 14.9% | 30 | 8,700,000 |
| 4 | Ramp | Pennyrile Pkwy SB | WKP EB | 1.5% | 3,400 | 40.0% | 1,360 | 7.4% | 9.1% | 250 | 310 | 14.9% | 50 | 12,400,000 |
| 5 | Ramp | WKP EB | Pennyrile Pkwy SB | 1.5% | 300 | 40.0% | 120 | 8.9% | 11.8% | 30 | 40 | 14.9% | 10 | 1,000,000 |
| 6 | Ramp | Pennyrile Pkwy SB | WKP EB | 1.5% | 3,600 | 40.0% | 1,440 | 6.9% | 9.6% | 250 | 350 | 14.9% | 50 | 12,900,000 |
| 7 | Ramp | WKP EB | Pennyrile Pkwy NB | 1.5% | 3,400 | 40.0% | 1,360 | 8.2% | 8.0% | 280 | 270 | 14.9% | 40 | 12,500,000 |
| 8 | Ramp | Pennyrile Pkwy NB | WKP EB | 1.5% | 2,500 | 40.0% | 1,000 | 8.4% | 8.0% | 210 | 200 | 14.9% | 30 | 9,200,000 |

Figure 2: 2013, 2020 and 2040 Forecast Summary



5.0 K FACTOR

Hourly factors were calculated by using the hourly count data from the nearby KYTC count stations as well as the road tube counts conducted for this study. The summary of raw hourly factors is provided in the Traffic Forecast Methodology Report as submitted to the KYTC Division of Planning.

The hourly factors were then adjusted by factors provided by the KYTC. These factors were derived from Automatic Traffic Recorder (ATR) data by functional classification, day of week, and month of year.

The final K factors were adjusted slightly to account for volume balancing, and the final K factors for each segment and ramp are shown in **Tables 2 - 4**.

6.0 PHF

Peak hour factors (PHF) were calculated from the 48-hour road tube counts conducted. A general analysis of the PHF indicates a range of 0.60 to 0.84. All of the PHFs for the interchange ramps were fairly low, in either the 0.60 or 0.70 ranges. As traffic continues to increase on the I-69 corridor into the future years, it is expected that this hourly variation will stabilize.

7.0 TRUCK PERCENTAGES

Vehicle classification data along the Pennyriple and Western Kentucky Parkways was obtained from the Statewide Vehicle Classification Database maintained by KYTC as shown in **Table 5** below. Classification counts were not requested at the time the data was collected therefore the ADT and DHV truck percentages for key study area links are derived from the nearby count stations shown below and are listed in **Tables 2** through **4**.

Table 5: Truck Percentages

| County | Date | Count Station | Direction | Mile Point | Daily Truck % |
|---------|------|---------------|-----------|------------|---------------|
| Hopkins | 2008 | 558 | Both | 45.0 | 33.4% |
| Hopkins | 2008 | 264 | Both | 32.0 | 34.9% |
| Hopkins | 2007 | 603 | Both | 37.8 | 35.1% |

To arrive at the 0.5% growth, the previous traffic forecasts performed in the vicinity of this interchange were evaluated. The interchange directly to the north had used a 2.0% growth rate. Another interchange further north had used a 0% growth rate. It was considered using a 1.5% growth rate similar to that used to grow the volumes, however, this resulted in an ADT truck percentage over 50% which seemed unrealistic in the future year. The Kentucky Official Coal Haul Highway System 2012 report was also consulted to see what impact that had on the study area and included in the ESAL calculations. Overall, it was decided to go with a more conservative truck growth rate at 0.5%, which is less than that for the interchange directly to the north, but shows some growth within the area. Using the 0.5% provided truck percentages of 40% in the future which seemed like reasonable growth given the characteristics of this corridor.

8.0 ESAL CALCULATIONS

The ESAL summary sheets are found in **Appendix A**. ESALS were calculated for all interchange ramps and mainline segments. The year 2040 was used as the design year which was agreed upon by KYTC. A summary of the ESALS are provided in **Table 6** below.

Table 6: Summary of ESALS

| SEGMENT | ROUTE | BEGINNING DESCRIPTION | ENDING DESCRIPTION | 2040 ESALS |
|---------|----------------|--------------------------------------|--------------------------------------|------------|
| A | WKP | East of Interchange | WKP WB Off-Ramp to NB Pennyrile Pkwy | 29,900,000 |
| E | WKP | Pennyrile Pkwy SB On-Ramp to WB WKP | West of Interchange | 23,200,000 |
| F | WKP | West of Interchange | WKP EB Off-Ramp to SB Pennyrile Pkwy | 23,100,000 |
| J | WKP | Pennyrile Pkwy NB On-Ramp to WB WKP | East of Interchange | 30,000,000 |
| K | Pennyrile Pkwy | South of Interchange | Pennyrile Pkwy NB Off-Ramp to EB WKP | 31,800,000 |
| O | Pennyrile Pkwy | WKP EB Off-Ramp to Pennyrile Pkwy | North of Interchange | 44,300,000 |
| P | Pennyrile Pkwy | North of Interchange | Pennyrile Pkwy SB Off-Ramp to WB WKP | 44,400,000 |
| T | Pennyrile Pkwy | WKP EB Off-Ramp to SB Pennyrile Pkwy | South of Interchange | 31,800,000 |
| 1 | Ramp | WKP WB | Pennyrile Pkwy NB | 13,200,000 |
| 2 | Ramp | Pennyrile Pkwy NB | WKP WB | 1,000,000 |
| 3 | Ramp | WKP WB | Pennyrile Pkwy SB | 8,700,000 |
| 4 | Ramp | Pennyrile Pkwy SB | WKP WB | 12,400,000 |
| 5 | Ramp | WKP EB | Pennyrile Parkway SB | 1,000,000 |
| 6 | Ramp | Pennyrile Pkwy SB | WKP EB | 12,900,000 |
| 7 | Ramp | WKP EB | Pennyrile Pkwy NB | 12,500,000 |
| 8 | Ramp | Pennyrile Pkwy NB | WKP EB | 9,200,000 |

9.0 POPULATION

Population data was obtained from the Kentucky State Data Center for Hopkins County and Kentucky. **Table 7** displays the historical population growth while **Table 8** displays population projections.

Table 7: Historical Population Growth

| Area | 1980 | 1990 | 2000 | 2010 | % Growth (2000-2010) |
|----------------|-----------|-----------|-----------|-----------|----------------------|
| Kentucky | 3,660,777 | 3,685,296 | 4,041,769 | 4,339,367 | 7.4% |
| Hopkins County | 46,174 | 46,126 | 46,519 | 46,920 | 0.9% |

Source: Kentucky State Data Center

Table 8: Population Forecasts

| Area | 2010 | 2020 | 2030 | 2040 | % Growth (2010-2040) |
|----------------|-----------|-----------|-----------|-----------|----------------------|
| Kentucky | 4,399,367 | 4,672,754 | 4,951,178 | 5,162,292 | 17.3% |
| Hopkins County | 46,920 | 48,007 | 48,204 | 47,836 | 2.0% |

Source: Kentucky State Data Center

As shown in **Table 7**, the population of Hopkins County increased 0.9% from 2000 to 2010 compared to 7.4% for Kentucky during the same time period. The population of Hopkins County is expected to increase 2.0% between 2010 and 2040. This compares to a growth of 17.3% in Kentucky at a rate of 0.5% per year.

Appendix A:

ESAL Forecasts

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | WKP | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | WKP |
| Segment Description | A - WKP WB | Beg. MP | 43.424 |
| | | End MP | 38.332 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 8.9% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 7000 | 1.50% | 7800 | 9020 | 10500 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 2450 | | 2820 | 3430 | 4200 |
| Percent Trucks Hauling Coal | (%CT) | 1.512% | -1.981% | 1.310% | 1.078% | 0.881% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 29,900,000

General Comments:

A - WKP WB East of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|
| 2020 | 7,800 | 63.8% | 36.2% | 4976 | 2824 | 0.01% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 951,207 |
| 2021 | 7,917 | 63.6% | 36.4% | 5037 | 2880 | 0.01% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 990,564 |
| 2022 | 8,036 | 63.4% | 36.6% | 5097 | 2938 | 0.01% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 1,031,550 |
| 2023 | 8,156 | 63.3% | 36.7% | 5159 | 2997 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 1,074,235 |
| 2024 | 8,279 | 63.1% | 36.9% | 5221 | 3057 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 1,118,688 |
| 2025 | 8,403 | 62.9% | 37.1% | 5284 | 3119 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 1,164,982 |
| 2026 | 8,529 | 62.7% | 37.3% | 5347 | 3181 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 1,213,194 |
| 2027 | 8,657 | 62.5% | 37.5% | 5411 | 3245 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 1,263,403 |
| 2028 | 8,787 | 62.3% | 37.7% | 5476 | 3310 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,315,692 |
| 2029 | 8,918 | 62.1% | 37.9% | 5542 | 3377 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 1,370,146 |
| 2030 | 9,052 | 61.9% | 38.1% | 5607 | 3445 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 1,426,857 |
| 2031 | 9,188 | 61.8% | 38.2% | 5674 | 3514 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 1,485,916 |
| 2032 | 9,326 | 61.6% | 38.4% | 5741 | 3584 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 1,547,422 |
| 2033 | 9,466 | 61.4% | 38.6% | 5809 | 3656 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 1,611,475 |
| 2034 | 9,608 | 61.2% | 38.8% | 5878 | 3730 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 1,678,181 |
| 2035 | 9,752 | 61.0% | 39.0% | 5947 | 3805 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 1,747,649 |
| 2036 | 9,898 | 60.8% | 39.2% | 6017 | 3881 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 1,819,995 |
| 2037 | 10,047 | 60.6% | 39.4% | 6088 | 3959 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 1,895,338 |
| 2038 | 10,197 | 60.4% | 39.6% | 6159 | 4038 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 1,973,801 |
| 2039 | 10,350 | 60.2% | 39.8% | 6231 | 4119 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 2,055,513 |
| 2040 | 10,505 | 60.0% | 40.0% | 6303 | 4202 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 2,140,609 |

5 yr ESALs
5,400,000

10 yr ESALs
12,000,000

15 yr ESALs
20,000,000

20 yr ESALs
29,900,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | WKP | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | WKP |
| Segment Description | E - WKP WB | Beg. MP | 92.506 |
| | | End MP | 106.41 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 10.2% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 5400 | 1.50% | 6000 | 6960 | 8100 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 1890 | | 2170 | 2650 | 3240 |
| Percent Trucks Hauling Coal | (%CT) | 0.053% | -1.981% | 0.046% | 0.038% | 0.031% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 23,200,000

General Comments:

E - WKP WB West of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|
| 2020 | 6,000 | 63.8% | 36.2% | 3828 | 2172 | 0.00% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 740,446 |
| 2021 | 6,090 | 63.6% | 36.4% | 3874 | 2216 | 0.00% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 770,914 |
| 2022 | 6,181 | 63.4% | 36.6% | 3921 | 2260 | 0.00% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 802,640 |
| 2023 | 6,274 | 63.3% | 36.7% | 3968 | 2306 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 835,677 |
| 2024 | 6,368 | 63.1% | 36.9% | 4016 | 2352 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 870,077 |
| 2025 | 6,464 | 62.9% | 37.1% | 4065 | 2399 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 905,899 |
| 2026 | 6,561 | 62.7% | 37.3% | 4113 | 2447 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 943,200 |
| 2027 | 6,659 | 62.5% | 37.5% | 4163 | 2496 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 982,042 |
| 2028 | 6,759 | 62.3% | 37.7% | 4212 | 2547 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,022,488 |
| 2029 | 6,860 | 62.1% | 37.9% | 4263 | 2598 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 1,064,605 |
| 2030 | 6,963 | 61.9% | 38.1% | 4313 | 2650 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 1,108,462 |
| 2031 | 7,068 | 61.8% | 38.2% | 4365 | 2703 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 1,154,131 |
| 2032 | 7,174 | 61.6% | 38.4% | 4416 | 2757 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 1,201,686 |
| 2033 | 7,281 | 61.4% | 38.6% | 4469 | 2813 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 1,251,206 |
| 2034 | 7,391 | 61.2% | 38.8% | 4521 | 2869 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 1,302,772 |
| 2035 | 7,501 | 61.0% | 39.0% | 4575 | 2927 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 1,356,469 |
| 2036 | 7,614 | 60.8% | 39.2% | 4629 | 2985 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 1,412,384 |
| 2037 | 7,728 | 60.6% | 39.4% | 4683 | 3045 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 1,470,610 |
| 2038 | 7,844 | 60.4% | 39.6% | 4738 | 3106 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 1,531,241 |
| 2039 | 7,962 | 60.2% | 39.8% | 4793 | 3169 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 1,594,378 |
| 2040 | 8,081 | 60.0% | 40.0% | 4849 | 3232 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 1,660,124 |

5 yr ESALs
4,200,000

10 yr ESALs
9,300,000

15 yr ESALs
15,600,000

20 yr ESALs
23,200,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | WKP | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | WKP |
| Segment Description | F - WKP EB | Beg. MP | 92.506 |
| | | End MP | 106.41 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 10.8% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 5400 | 1.50% | 6000 | 6960 | 8100 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 1890 | | 2170 | 2650 | 3240 |
| Percent Trucks Hauling Coal | (%CT) | 0.689% | -1.981% | 0.598% | 0.491% | 0.401% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

23,100,000

General Comments:

F - WKP EB West of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|
| 2020 | 6,000 | 63.8% | 36.2% | 3828 | 2172 | 0.00% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 736,620 |
| 2021 | 6,090 | 63.6% | 36.4% | 3874 | 2216 | 0.00% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 767,003 |
| 2022 | 6,181 | 63.4% | 36.6% | 3921 | 2260 | 0.00% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 798,643 |
| 2023 | 6,274 | 63.3% | 36.7% | 3968 | 2306 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 831,591 |
| 2024 | 6,368 | 63.1% | 36.9% | 4016 | 2352 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 865,901 |
| 2025 | 6,464 | 62.9% | 37.1% | 4065 | 2399 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 901,631 |
| 2026 | 6,561 | 62.7% | 37.3% | 4113 | 2447 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 938,838 |
| 2027 | 6,659 | 62.5% | 37.5% | 4163 | 2496 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 977,584 |
| 2028 | 6,759 | 62.3% | 37.7% | 4212 | 2547 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,017,932 |
| 2029 | 6,860 | 62.1% | 37.9% | 4263 | 2598 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 1,059,949 |
| 2030 | 6,963 | 61.9% | 38.1% | 4313 | 2650 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 1,103,704 |
| 2031 | 7,068 | 61.8% | 38.2% | 4365 | 2703 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 1,149,269 |
| 2032 | 7,174 | 61.6% | 38.4% | 4416 | 2757 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 1,196,718 |
| 2033 | 7,281 | 61.4% | 38.6% | 4469 | 2813 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 1,246,129 |
| 2034 | 7,391 | 61.2% | 38.8% | 4521 | 2869 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 1,297,584 |
| 2035 | 7,501 | 61.0% | 39.0% | 4575 | 2927 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 1,351,168 |
| 2036 | 7,614 | 60.8% | 39.2% | 4629 | 2985 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 1,406,967 |
| 2037 | 7,728 | 60.6% | 39.4% | 4683 | 3045 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 1,465,075 |
| 2038 | 7,844 | 60.4% | 39.6% | 4738 | 3106 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 1,525,586 |
| 2039 | 7,962 | 60.2% | 39.8% | 4793 | 3169 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 1,588,600 |
| 2040 | 8,081 | 60.0% | 40.0% | 4849 | 3232 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 1,654,220 |

5 yr ESALs
4,200,000

10 yr ESALs
9,300,000

15 yr ESALs
15,500,000

20 yr ESALs
23,100,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | WKP | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | WKP |
| Segment Description | J - WKP EB | Beg. MP | 43.424 |
| | | End MP | 38.332 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 10.7% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 7000 | 1.50% | 7800 | 9020 | 10500 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 2450 | | 2820 | 3430 | 4200 |
| Percent Trucks Hauling Coal | (%CT) | 1.144% | -1.981% | 0.992% | 0.816% | 0.667% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

30,000,000

General Comments:

J - WKP EB East of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|
| 2020 | 7,800 | 63.8% | 36.2% | 4976 | 2824 | 0.00% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 954,076 |
| 2021 | 7,917 | 63.6% | 36.4% | 5037 | 2880 | 0.00% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 993,496 |
| 2022 | 8,036 | 63.4% | 36.6% | 5097 | 2938 | 0.00% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 1,034,547 |
| 2023 | 8,156 | 63.3% | 36.7% | 5159 | 2997 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 1,077,298 |
| 2024 | 8,279 | 63.1% | 36.9% | 5221 | 3057 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 1,121,818 |
| 2025 | 8,403 | 62.9% | 37.1% | 5284 | 3119 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 1,168,182 |
| 2026 | 8,529 | 62.7% | 37.3% | 5347 | 3181 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 1,216,464 |
| 2027 | 8,657 | 62.5% | 37.5% | 5411 | 3245 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 1,266,745 |
| 2028 | 8,787 | 62.3% | 37.7% | 5476 | 3310 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,319,107 |
| 2029 | 8,918 | 62.1% | 37.9% | 5542 | 3377 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 1,373,637 |
| 2030 | 9,052 | 61.9% | 38.1% | 5607 | 3445 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 1,430,424 |
| 2031 | 9,188 | 61.8% | 38.2% | 5674 | 3514 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 1,489,561 |
| 2032 | 9,326 | 61.6% | 38.4% | 5741 | 3584 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 1,551,147 |
| 2033 | 9,466 | 61.4% | 38.6% | 5809 | 3656 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 1,615,281 |
| 2034 | 9,608 | 61.2% | 38.8% | 5878 | 3730 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 1,682,070 |
| 2035 | 9,752 | 61.0% | 39.0% | 5947 | 3805 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 1,751,624 |
| 2036 | 9,898 | 60.8% | 39.2% | 6017 | 3881 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 1,824,057 |
| 2037 | 10,047 | 60.6% | 39.4% | 6088 | 3959 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 1,899,488 |
| 2038 | 10,197 | 60.4% | 39.6% | 6159 | 4038 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 1,978,041 |
| 2039 | 10,350 | 60.2% | 39.8% | 6231 | 4119 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 2,059,845 |
| 2040 | 10,505 | 60.0% | 40.0% | 6303 | 4202 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 2,145,036 |

5 yr ESALs
5,400,000

10 yr ESALs
12,000,000

15 yr ESALs
20,100,000

20 yr ESALs
30,000,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|-----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Pennyrile | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | Pennyrile |
| Segment Description | K - Pennyrile NB | Beg. MP | 33.566 |
| | | End MP | 34.271 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 11.9% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 7500 | 1.50% | 8200 | 9660 | 11200 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 2620 | | 2970 | 3680 | 4480 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

31,800,000

General Comments:

K - Pennyriple NB South of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs | |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|---------------------------|
| 2020 | 8,200 | 63.8% | 36.2% | 5231 | 2969 | 0.00% | 3.99 | 0.29 | 0 | 0 | 0.800 | 1,012,379 | |
| 2021 | 8,323 | 63.6% | 36.4% | 5295 | 3028 | 0.00% | 4.01 | 0.30 | 0 | 0 | 0.800 | 1,054,028 | |
| 2022 | 8,448 | 63.4% | 36.6% | 5359 | 3089 | 0.00% | 4.03 | 0.30 | 0 | 0 | 0.800 | 1,097,397 | |
| 2023 | 8,575 | 63.3% | 36.7% | 5424 | 3151 | 0.00% | 4.05 | 0.30 | 0 | 0 | 0.800 | 1,142,557 | |
| 2024 | 8,703 | 63.1% | 36.9% | 5489 | 3214 | 0.00% | 4.07 | 0.31 | 0 | 0 | 0.800 | 1,189,581 | 5 yr ESALs 5,700,000 |
| 2025 | 8,834 | 62.9% | 37.1% | 5555 | 3279 | 0.00% | 4.09 | 0.31 | 0 | 0 | 0.800 | 1,238,548 | |
| 2026 | 8,966 | 62.7% | 37.3% | 5622 | 3345 | 0.00% | 4.11 | 0.32 | 0 | 0 | 0.800 | 1,289,537 | |
| 2027 | 9,101 | 62.5% | 37.5% | 5689 | 3412 | 0.00% | 4.12 | 0.32 | 0 | 0 | 0.800 | 1,342,632 | |
| 2028 | 9,237 | 62.3% | 37.7% | 5757 | 3480 | 0.00% | 4.14 | 0.33 | 0 | 0 | 0.800 | 1,397,920 | |
| 2029 | 9,376 | 62.1% | 37.9% | 5826 | 3550 | 0.00% | 4.16 | 0.34 | 0 | 0 | 0.800 | 1,455,491 | 10 yr ESALs 12,700,000 |
| 2030 | 9,516 | 61.9% | 38.1% | 5895 | 3621 | 0.00% | 4.18 | 0.34 | 0 | 0 | 0.800 | 1,515,440 | |
| 2031 | 9,659 | 61.8% | 38.2% | 5965 | 3694 | 0.00% | 4.20 | 0.35 | 0 | 0 | 0.800 | 1,577,866 | |
| 2032 | 9,804 | 61.6% | 38.4% | 6036 | 3768 | 0.00% | 4.22 | 0.35 | 0 | 0 | 0.800 | 1,642,870 | |
| 2033 | 9,951 | 61.4% | 38.6% | 6107 | 3844 | 0.00% | 4.24 | 0.36 | 0 | 0 | 0.800 | 1,710,560 | |
| 2034 | 10,100 | 61.2% | 38.8% | 6179 | 3921 | 0.00% | 4.27 | 0.36 | 0 | 0 | 0.800 | 1,781,046 | 15 yr ESALs 21,300,000 |
| 2035 | 10,252 | 61.0% | 39.0% | 6252 | 4000 | 0.00% | 4.29 | 0.37 | 0 | 0 | 0.800 | 1,854,445 | |
| 2036 | 10,406 | 60.8% | 39.2% | 6326 | 4080 | 0.00% | 4.31 | 0.37 | 0 | 0 | 0.800 | 1,930,875 | |
| 2037 | 10,562 | 60.6% | 39.4% | 6400 | 4162 | 0.00% | 4.33 | 0.38 | 0 | 0 | 0.800 | 2,010,464 | |
| 2038 | 10,720 | 60.4% | 39.6% | 6475 | 4246 | 0.00% | 4.35 | 0.39 | 0 | 0 | 0.800 | 2,093,340 | |
| 2039 | 10,881 | 60.2% | 39.8% | 6550 | 4331 | 0.00% | 4.37 | 0.39 | 0 | 0 | 0.800 | 2,179,641 | 20 yr ESALs 31,800,000 |
| 2040 | 11,044 | 60.0% | 40.0% | 6627 | 4418 | 0.00% | 4.39 | 0.40 | 0 | 0 | 0.800 | 2,269,508 | |

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|-----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Pennyrile | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | Pennyrile |
| Segment Description | O - Pennyrile NB | Beg. MP | 35.6705 |
| | | End MP | 37.07 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 10.9% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 10400 | 1.50% | 11500 | 13400 | 15500 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 3640 | | 4160 | 5100 | 6200 |
| Percent Trucks Hauling Coal | (%CT) | 1.018% | -1.957% | 0.889% | 0.726% | 0.597% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 44,300,000

General Comments:

O - Pennyriple NB North of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs | |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|---------------------------|
| 2020 | 11,500 | 63.8% | 36.2% | 7337 | 4163 | 0.00% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 1,408,012 | |
| 2021 | 11,673 | 63.6% | 36.4% | 7426 | 4247 | 0.00% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 1,466,162 | |
| 2022 | 11,848 | 63.4% | 36.6% | 7515 | 4332 | 0.00% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 1,526,717 | |
| 2023 | 12,025 | 63.3% | 36.7% | 7606 | 4419 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 1,589,779 | |
| 2024 | 12,206 | 63.1% | 36.9% | 7698 | 4508 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 1,655,450 | 5 yr ESALs 8,000,000 |
| 2025 | 12,389 | 62.9% | 37.1% | 7790 | 4598 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 1,723,839 | |
| 2026 | 12,575 | 62.7% | 37.3% | 7884 | 4691 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 1,795,058 | |
| 2027 | 12,763 | 62.5% | 37.5% | 7978 | 4785 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 1,869,224 | |
| 2028 | 12,955 | 62.3% | 37.7% | 8074 | 4881 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,946,460 | |
| 2029 | 13,149 | 62.1% | 37.9% | 8170 | 4979 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 2,026,892 | 10 yr ESALs 17,700,000 |
| 2030 | 13,346 | 61.9% | 38.1% | 8267 | 5079 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 2,110,653 | |
| 2031 | 13,546 | 61.8% | 38.2% | 8366 | 5181 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 2,197,880 | |
| 2032 | 13,750 | 61.6% | 38.4% | 8465 | 5285 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 2,288,717 | |
| 2033 | 13,956 | 61.4% | 38.6% | 8565 | 5391 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 2,383,313 | |
| 2034 | 14,165 | 61.2% | 38.8% | 8666 | 5499 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 2,481,823 | 15 yr ESALs 29,600,000 |
| 2035 | 14,378 | 61.0% | 39.0% | 8768 | 5609 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 2,584,411 | |
| 2036 | 14,593 | 60.8% | 39.2% | 8871 | 5722 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 2,691,244 | |
| 2037 | 14,812 | 60.6% | 39.4% | 8975 | 5837 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 2,802,498 | |
| 2038 | 15,034 | 60.4% | 39.6% | 9080 | 5954 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 2,918,357 | |
| 2039 | 15,260 | 60.2% | 39.8% | 9186 | 6074 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 3,039,010 | 20 yr ESALs 44,300,000 |
| 2040 | 15,489 | 60.0% | 40.0% | 9293 | 6196 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 3,164,656 | |

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|-----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Pennyrile | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | Pennyrile |
| Segment Description | P - Pennyrile SB | Beg. MP | 35.6705 |
| | | End MP | 37.07 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 11.2% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 10400 | 1.50% | 11500 | 13400 | 15500 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 3640 | | 4160 | 5100 | 6200 |
| Percent Trucks Hauling Coal | (%CT) | 0.440% | -1.957% | 0.384% | 0.314% | 0.258% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

44,400,000

General Comments:

P - Pennyriple SB North of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|
| 2020 | 11,500 | 63.8% | 36.2% | 7337 | 4163 | 0.00% | 3.99 | 0.29 | 5.123 | 3.3 | 0.800 | 1,414,708 |
| 2021 | 11,673 | 63.6% | 36.4% | 7426 | 4247 | 0.00% | 4.01 | 0.30 | 5.123 | 3.3 | 0.800 | 1,473,005 |
| 2022 | 11,848 | 63.4% | 36.6% | 7515 | 4332 | 0.00% | 4.03 | 0.30 | 5.123 | 3.3 | 0.800 | 1,533,712 |
| 2023 | 12,025 | 63.3% | 36.7% | 7606 | 4419 | 0.00% | 4.05 | 0.30 | 5.123 | 3.3 | 0.800 | 1,596,928 |
| 2024 | 12,206 | 63.1% | 36.9% | 7698 | 4508 | 0.00% | 4.07 | 0.31 | 5.123 | 3.3 | 0.800 | 1,662,757 |
| 2025 | 12,389 | 62.9% | 37.1% | 7790 | 4598 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 0.800 | 1,731,307 |
| 2026 | 12,575 | 62.7% | 37.3% | 7884 | 4691 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 0.800 | 1,802,691 |
| 2027 | 12,763 | 62.5% | 37.5% | 7978 | 4785 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 0.800 | 1,877,025 |
| 2028 | 12,955 | 62.3% | 37.7% | 8074 | 4881 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 0.800 | 1,954,432 |
| 2029 | 13,149 | 62.1% | 37.9% | 8170 | 4979 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 0.800 | 2,035,039 |
| 2030 | 13,346 | 61.9% | 38.1% | 8267 | 5079 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 0.800 | 2,118,978 |
| 2031 | 13,546 | 61.8% | 38.2% | 8366 | 5181 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 0.800 | 2,206,388 |
| 2032 | 13,750 | 61.6% | 38.4% | 8465 | 5285 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 0.800 | 2,297,411 |
| 2033 | 13,956 | 61.4% | 38.6% | 8565 | 5391 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 0.800 | 2,392,197 |
| 2034 | 14,165 | 61.2% | 38.8% | 8666 | 5499 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 0.800 | 2,490,901 |
| 2035 | 14,378 | 61.0% | 39.0% | 8768 | 5609 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 0.800 | 2,593,687 |
| 2036 | 14,593 | 60.8% | 39.2% | 8871 | 5722 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 0.800 | 2,700,722 |
| 2037 | 14,812 | 60.6% | 39.4% | 8975 | 5837 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 0.800 | 2,812,183 |
| 2038 | 15,034 | 60.4% | 39.6% | 9080 | 5954 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 0.800 | 2,928,252 |
| 2039 | 15,260 | 60.2% | 39.8% | 9186 | 6074 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 0.800 | 3,049,120 |
| 2040 | 15,489 | 60.0% | 40.0% | 9293 | 6196 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 0.800 | 3,174,985 |

5 yr ESALs
8,000,000

10 yr ESALs
17,800,000

15 yr ESALs
29,800,000

20 yr ESALs
44,400,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|---------------------------------------|--------------|-----------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Pennyrile | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 Traffic Forecast | Item No. | 2-225.00 |
| Scenario | 2040 | Route No. | Pennyrile |
| Segment Description | T - Pennyrile SB | Beg. MP | 33.566 |
| | | End MP | 34.271 |
| | | T.F. No. | - |
| | | No. of Lanes | 2 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 8.4% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.90 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 7500 | 1.50% | 8200 | 9660 | 11200 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 2620 | | 2970 | 3680 | 4480 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

31,800,000

General Comments:

T - Pennyriple SB South of Interchange (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs | |
|------|--------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|-----------|---------------------------|
| 2020 | 8,200 | 63.8% | 36.2% | 5231 | 2969 | 0.00% | 3.99 | 0.29 | 0 | 0 | 0.800 | 1,012,379 | |
| 2021 | 8,323 | 63.6% | 36.4% | 5295 | 3028 | 0.00% | 4.01 | 0.30 | 0 | 0 | 0.800 | 1,054,028 | |
| 2022 | 8,448 | 63.4% | 36.6% | 5359 | 3089 | 0.00% | 4.03 | 0.30 | 0 | 0 | 0.800 | 1,097,397 | |
| 2023 | 8,575 | 63.3% | 36.7% | 5424 | 3151 | 0.00% | 4.05 | 0.30 | 0 | 0 | 0.800 | 1,142,557 | |
| 2024 | 8,703 | 63.1% | 36.9% | 5489 | 3214 | 0.00% | 4.07 | 0.31 | 0 | 0 | 0.800 | 1,189,581 | 5 yr ESALs 5,700,000 |
| 2025 | 8,834 | 62.9% | 37.1% | 5555 | 3279 | 0.00% | 4.09 | 0.31 | 0 | 0 | 0.800 | 1,238,548 | |
| 2026 | 8,966 | 62.7% | 37.3% | 5622 | 3345 | 0.00% | 4.11 | 0.32 | 0 | 0 | 0.800 | 1,289,537 | |
| 2027 | 9,101 | 62.5% | 37.5% | 5689 | 3412 | 0.00% | 4.12 | 0.32 | 0 | 0 | 0.800 | 1,342,632 | |
| 2028 | 9,237 | 62.3% | 37.7% | 5757 | 3480 | 0.00% | 4.14 | 0.33 | 0 | 0 | 0.800 | 1,397,920 | |
| 2029 | 9,376 | 62.1% | 37.9% | 5826 | 3550 | 0.00% | 4.16 | 0.34 | 0 | 0 | 0.800 | 1,455,491 | 10 yr ESALs 12,700,000 |
| 2030 | 9,516 | 61.9% | 38.1% | 5895 | 3621 | 0.00% | 4.18 | 0.34 | 0 | 0 | 0.800 | 1,515,440 | |
| 2031 | 9,659 | 61.8% | 38.2% | 5965 | 3694 | 0.00% | 4.20 | 0.35 | 0 | 0 | 0.800 | 1,577,866 | |
| 2032 | 9,804 | 61.6% | 38.4% | 6036 | 3768 | 0.00% | 4.22 | 0.35 | 0 | 0 | 0.800 | 1,642,870 | |
| 2033 | 9,951 | 61.4% | 38.6% | 6107 | 3844 | 0.00% | 4.24 | 0.36 | 0 | 0 | 0.800 | 1,710,560 | |
| 2034 | 10,100 | 61.2% | 38.8% | 6179 | 3921 | 0.00% | 4.27 | 0.36 | 0 | 0 | 0.800 | 1,781,046 | 15 yr ESALs 21,300,000 |
| 2035 | 10,252 | 61.0% | 39.0% | 6252 | 4000 | 0.00% | 4.29 | 0.37 | 0 | 0 | 0.800 | 1,854,445 | |
| 2036 | 10,406 | 60.8% | 39.2% | 6326 | 4080 | 0.00% | 4.31 | 0.37 | 0 | 0 | 0.800 | 1,930,875 | |
| 2037 | 10,562 | 60.6% | 39.4% | 6400 | 4162 | 0.00% | 4.33 | 0.38 | 0 | 0 | 0.800 | 2,010,464 | |
| 2038 | 10,720 | 60.4% | 39.6% | 6475 | 4246 | 0.00% | 4.35 | 0.39 | 0 | 0 | 0.800 | 2,093,340 | |
| 2039 | 10,881 | 60.2% | 39.8% | 6550 | 4331 | 0.00% | 4.37 | 0.39 | 0 | 0 | 0.800 | 2,179,641 | 20 yr ESALs 31,800,000 |
| 2040 | 11,044 | 60.0% | 40.0% | 6627 | 4418 | 0.00% | 4.39 | 0.40 | 0 | 0 | 0.800 | 2,269,508 | |

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 1 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 8.2% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 2500 | 1.50% | 2800 | 3220 | 3700 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 870 | | 1010 | 1230 | 1480 |
| Percent Trucks Hauling Coal | (%CT) | 4.233% | -1.932% | 3.650% | 3.020% | 2.500% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 13,200,000

General Comments:

Ramp 1 WK WB to Pennyriple NB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 2,800 | 63.8% | 36.2% | 1786 | 1014 | 0.01% | 3.99 | 0.29 | 5.123 | 3.3 | 1.000 | 417,379 |
| 2021 | 2,842 | 63.6% | 36.4% | 1808 | 1034 | 0.01% | 4.01 | 0.30 | 5.123 | 3.3 | 1.000 | 434,829 |
| 2022 | 2,885 | 63.4% | 36.6% | 1830 | 1055 | 0.01% | 4.03 | 0.30 | 5.123 | 3.3 | 1.000 | 453,007 |
| 2023 | 2,928 | 63.3% | 36.7% | 1852 | 1076 | 0.01% | 4.05 | 0.30 | 5.123 | 3.3 | 1.000 | 471,942 |
| 2024 | 2,972 | 63.1% | 36.9% | 1874 | 1098 | 0.01% | 4.07 | 0.31 | 5.123 | 3.3 | 1.000 | 491,666 |
| 2025 | 3,016 | 62.9% | 37.1% | 1897 | 1120 | 0.01% | 4.09 | 0.31 | 5.123 | 3.3 | 1.000 | 512,212 |
| 2026 | 3,062 | 62.7% | 37.3% | 1920 | 1142 | 0.01% | 4.11 | 0.32 | 5.123 | 3.3 | 1.000 | 533,613 |
| 2027 | 3,108 | 62.5% | 37.5% | 1943 | 1165 | 0.01% | 4.12 | 0.32 | 5.123 | 3.3 | 1.000 | 555,906 |
| 2028 | 3,154 | 62.3% | 37.7% | 1966 | 1188 | 0.01% | 4.14 | 0.33 | 5.123 | 3.3 | 1.000 | 579,127 |
| 2029 | 3,201 | 62.1% | 37.9% | 1989 | 1212 | 0.01% | 4.16 | 0.34 | 5.123 | 3.3 | 1.000 | 603,315 |
| 2030 | 3,250 | 61.9% | 38.1% | 2013 | 1237 | 0.01% | 4.18 | 0.34 | 5.123 | 3.3 | 1.000 | 628,510 |
| 2031 | 3,298 | 61.8% | 38.2% | 2037 | 1261 | 0.01% | 4.20 | 0.35 | 5.123 | 3.3 | 1.000 | 654,753 |
| 2032 | 3,348 | 61.6% | 38.4% | 2061 | 1287 | 0.01% | 4.22 | 0.35 | 5.123 | 3.3 | 1.000 | 682,089 |
| 2033 | 3,398 | 61.4% | 38.6% | 2085 | 1313 | 0.01% | 4.24 | 0.36 | 5.123 | 3.3 | 1.000 | 710,563 |
| 2034 | 3,449 | 61.2% | 38.8% | 2110 | 1339 | 0.01% | 4.27 | 0.36 | 5.123 | 3.3 | 1.000 | 740,221 |
| 2035 | 3,501 | 61.0% | 39.0% | 2135 | 1366 | 0.01% | 4.29 | 0.37 | 5.123 | 3.3 | 1.000 | 771,113 |
| 2036 | 3,553 | 60.8% | 39.2% | 2160 | 1393 | 0.01% | 4.31 | 0.37 | 5.123 | 3.3 | 1.000 | 803,291 |
| 2037 | 3,606 | 60.6% | 39.4% | 2185 | 1421 | 0.01% | 4.33 | 0.38 | 5.123 | 3.3 | 1.000 | 836,807 |
| 2038 | 3,661 | 60.4% | 39.6% | 2211 | 1450 | 0.01% | 4.35 | 0.39 | 5.123 | 3.3 | 1.000 | 871,717 |
| 2039 | 3,715 | 60.2% | 39.8% | 2237 | 1479 | 0.01% | 4.37 | 0.39 | 5.123 | 3.3 | 1.000 | 908,079 |
| 2040 | 3,771 | 60.0% | 40.0% | 2263 | 1508 | 0.01% | 4.39 | 0.40 | 5.123 | 3.3 | 1.000 | 945,953 |

5 yr ESALs
2,400,000

10 yr ESALs
5,300,000

15 yr ESALs
8,800,000

20 yr ESALs
13,200,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 2 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 11.4% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 200 | 1.50% | 200 | 260 | 300 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 70 | | 70 | 100 | 120 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 1,000,000

General Comments:

Ramp 2 Pennyrile NB to WK WB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-----|-------|---------|------|--------|-------|------|---------|-------|---------|-------|--------|
| 2020 | 200 | 63.8% | 36.2% | 128 | 72 | 0.00% | 3.99 | 0.29 | 0 | 0 | 1.000 | 30,865 |
| 2021 | 203 | 63.6% | 36.4% | 129 | 74 | 0.00% | 4.01 | 0.30 | 0 | 0 | 1.000 | 32,135 |
| 2022 | 206 | 63.4% | 36.6% | 131 | 75 | 0.00% | 4.03 | 0.30 | 0 | 0 | 1.000 | 33,457 |
| 2023 | 209 | 63.3% | 36.7% | 132 | 77 | 0.00% | 4.05 | 0.30 | 0 | 0 | 1.000 | 34,834 |
| 2024 | 212 | 63.1% | 36.9% | 134 | 78 | 0.00% | 4.07 | 0.31 | 0 | 0 | 1.000 | 36,268 |
| 2025 | 215 | 62.9% | 37.1% | 135 | 80 | 0.00% | 4.09 | 0.31 | 0 | 0 | 1.000 | 37,761 |
| 2026 | 219 | 62.7% | 37.3% | 137 | 82 | 0.00% | 4.11 | 0.32 | 0 | 0 | 1.000 | 39,315 |
| 2027 | 222 | 62.5% | 37.5% | 139 | 83 | 0.00% | 4.12 | 0.32 | 0 | 0 | 1.000 | 40,934 |
| 2028 | 225 | 62.3% | 37.7% | 140 | 85 | 0.00% | 4.14 | 0.33 | 0 | 0 | 1.000 | 42,619 |
| 2029 | 229 | 62.1% | 37.9% | 142 | 87 | 0.00% | 4.16 | 0.34 | 0 | 0 | 1.000 | 44,375 |
| 2030 | 232 | 61.9% | 38.1% | 144 | 88 | 0.00% | 4.18 | 0.34 | 0 | 0 | 1.000 | 46,202 |
| 2031 | 236 | 61.8% | 38.2% | 145 | 90 | 0.00% | 4.20 | 0.35 | 0 | 0 | 1.000 | 48,106 |
| 2032 | 239 | 61.6% | 38.4% | 147 | 92 | 0.00% | 4.22 | 0.35 | 0 | 0 | 1.000 | 50,088 |
| 2033 | 243 | 61.4% | 38.6% | 149 | 94 | 0.00% | 4.24 | 0.36 | 0 | 0 | 1.000 | 52,151 |
| 2034 | 246 | 61.2% | 38.8% | 151 | 96 | 0.00% | 4.27 | 0.36 | 0 | 0 | 1.000 | 54,300 |
| 2035 | 250 | 61.0% | 39.0% | 152 | 98 | 0.00% | 4.29 | 0.37 | 0 | 0 | 1.000 | 56,538 |
| 2036 | 254 | 60.8% | 39.2% | 154 | 100 | 0.00% | 4.31 | 0.37 | 0 | 0 | 1.000 | 58,868 |
| 2037 | 258 | 60.6% | 39.4% | 156 | 102 | 0.00% | 4.33 | 0.38 | 0 | 0 | 1.000 | 61,295 |
| 2038 | 261 | 60.4% | 39.6% | 158 | 104 | 0.00% | 4.35 | 0.39 | 0 | 0 | 1.000 | 63,821 |
| 2039 | 265 | 60.2% | 39.8% | 160 | 106 | 0.00% | 4.37 | 0.39 | 0 | 0 | 1.000 | 66,452 |
| 2040 | 269 | 60.0% | 40.0% | 162 | 108 | 0.00% | 4.39 | 0.40 | 0 | 0 | 1.000 | 69,192 |

5 yr ESALs
200,000

10 yr ESALs
400,000

15 yr ESALs
600,000

20 yr ESALs
1,000,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 3 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 7.5% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 1600 | 1.50% | 1800 | 2060 | 2400 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 560 | | 650 | 780 | 960 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 8,700,000

General Comments:

Ramp 3 WK WB to Pennyryle SB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 1,800 | 63.8% | 36.2% | 1148 | 652 | 0.00% | 3.99 | 0.29 | 0 | 0 | 1.000 | 277,787 |
| 2021 | 1,827 | 63.6% | 36.4% | 1162 | 665 | 0.00% | 4.01 | 0.30 | 0 | 0 | 1.000 | 289,215 |
| 2022 | 1,854 | 63.4% | 36.6% | 1176 | 678 | 0.00% | 4.03 | 0.30 | 0 | 0 | 1.000 | 301,115 |
| 2023 | 1,882 | 63.3% | 36.7% | 1191 | 692 | 0.00% | 4.05 | 0.30 | 0 | 0 | 1.000 | 313,506 |
| 2024 | 1,910 | 63.1% | 36.9% | 1205 | 706 | 0.00% | 4.07 | 0.31 | 0 | 0 | 1.000 | 326,410 |
| 2025 | 1,939 | 62.9% | 37.1% | 1219 | 720 | 0.00% | 4.09 | 0.31 | 0 | 0 | 1.000 | 339,846 |
| 2026 | 1,968 | 62.7% | 37.3% | 1234 | 734 | 0.00% | 4.11 | 0.32 | 0 | 0 | 1.000 | 353,836 |
| 2027 | 1,998 | 62.5% | 37.5% | 1249 | 749 | 0.00% | 4.12 | 0.32 | 0 | 0 | 1.000 | 368,405 |
| 2028 | 2,028 | 62.3% | 37.7% | 1264 | 764 | 0.00% | 4.14 | 0.33 | 0 | 0 | 1.000 | 383,575 |
| 2029 | 2,058 | 62.1% | 37.9% | 1279 | 779 | 0.00% | 4.16 | 0.34 | 0 | 0 | 1.000 | 399,373 |
| 2030 | 2,089 | 61.9% | 38.1% | 1294 | 795 | 0.00% | 4.18 | 0.34 | 0 | 0 | 1.000 | 415,822 |
| 2031 | 2,120 | 61.8% | 38.2% | 1309 | 811 | 0.00% | 4.20 | 0.35 | 0 | 0 | 1.000 | 432,951 |
| 2032 | 2,152 | 61.6% | 38.4% | 1325 | 827 | 0.00% | 4.22 | 0.35 | 0 | 0 | 1.000 | 450,788 |
| 2033 | 2,184 | 61.4% | 38.6% | 1341 | 844 | 0.00% | 4.24 | 0.36 | 0 | 0 | 1.000 | 469,361 |
| 2034 | 2,217 | 61.2% | 38.8% | 1356 | 861 | 0.00% | 4.27 | 0.36 | 0 | 0 | 1.000 | 488,702 |
| 2035 | 2,250 | 61.0% | 39.0% | 1372 | 878 | 0.00% | 4.29 | 0.37 | 0 | 0 | 1.000 | 508,842 |
| 2036 | 2,284 | 60.8% | 39.2% | 1389 | 896 | 0.00% | 4.31 | 0.37 | 0 | 0 | 1.000 | 529,813 |
| 2037 | 2,318 | 60.6% | 39.4% | 1405 | 914 | 0.00% | 4.33 | 0.38 | 0 | 0 | 1.000 | 551,652 |
| 2038 | 2,353 | 60.4% | 39.6% | 1421 | 932 | 0.00% | 4.35 | 0.39 | 0 | 0 | 1.000 | 574,392 |
| 2039 | 2,389 | 60.2% | 39.8% | 1438 | 951 | 0.00% | 4.37 | 0.39 | 0 | 0 | 1.000 | 598,072 |
| 2040 | 2,424 | 60.0% | 40.0% | 1455 | 970 | 0.00% | 4.39 | 0.40 | 0 | 0 | 1.000 | 622,731 |

5 yr ESALs
1,600,000

10 yr ESALs
3,500,000

15 yr ESALs
5,800,000

20 yr ESALs
8,700,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 4 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 9.1% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 2300 | 1.50% | 2600 | 2960 | 3400 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 800 | | 940 | 1130 | 1360 |
| Percent Trucks Hauling Coal | (%CT) | 1.990% | -1.928% | 1.700% | 1.420% | 1.176% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 12,400,000

General Comments:

Ramp 4 Pennyrile SB to WK WB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 2,600 | 63.8% | 36.2% | 1659 | 941 | 0.01% | 3.99 | 0.29 | 5.123 | 3.3 | 1.000 | 394,883 |
| 2021 | 2,639 | 63.6% | 36.4% | 1679 | 960 | 0.01% | 4.01 | 0.30 | 5.123 | 3.3 | 1.000 | 411,249 |
| 2022 | 2,679 | 63.4% | 36.6% | 1699 | 979 | 0.01% | 4.03 | 0.30 | 5.123 | 3.3 | 1.000 | 428,293 |
| 2023 | 2,719 | 63.3% | 36.7% | 1720 | 999 | 0.01% | 4.05 | 0.30 | 5.123 | 3.3 | 1.000 | 446,045 |
| 2024 | 2,760 | 63.1% | 36.9% | 1740 | 1019 | 0.01% | 4.07 | 0.31 | 5.123 | 3.3 | 1.000 | 464,532 |
| 2025 | 2,801 | 62.9% | 37.1% | 1761 | 1040 | 0.01% | 4.09 | 0.31 | 5.123 | 3.3 | 1.000 | 483,787 |
| 2026 | 2,843 | 62.7% | 37.3% | 1782 | 1060 | 0.01% | 4.11 | 0.32 | 5.123 | 3.3 | 1.000 | 503,839 |
| 2027 | 2,886 | 62.5% | 37.5% | 1804 | 1082 | 0.01% | 4.12 | 0.32 | 5.123 | 3.3 | 1.000 | 524,723 |
| 2028 | 2,929 | 62.3% | 37.7% | 1825 | 1103 | 0.01% | 4.14 | 0.33 | 5.123 | 3.3 | 1.000 | 546,472 |
| 2029 | 2,973 | 62.1% | 37.9% | 1847 | 1126 | 0.01% | 4.16 | 0.34 | 5.123 | 3.3 | 1.000 | 569,124 |
| 2030 | 3,017 | 61.9% | 38.1% | 1869 | 1148 | 0.01% | 4.18 | 0.34 | 5.123 | 3.3 | 1.000 | 592,714 |
| 2031 | 3,063 | 61.8% | 38.2% | 1891 | 1171 | 0.01% | 4.20 | 0.35 | 5.123 | 3.3 | 1.000 | 617,282 |
| 2032 | 3,109 | 61.6% | 38.4% | 1914 | 1195 | 0.01% | 4.22 | 0.35 | 5.123 | 3.3 | 1.000 | 642,869 |
| 2033 | 3,155 | 61.4% | 38.6% | 1936 | 1219 | 0.01% | 4.24 | 0.36 | 5.123 | 3.3 | 1.000 | 669,516 |
| 2034 | 3,203 | 61.2% | 38.8% | 1959 | 1243 | 0.01% | 4.27 | 0.36 | 5.123 | 3.3 | 1.000 | 697,268 |
| 2035 | 3,251 | 61.0% | 39.0% | 1982 | 1268 | 0.01% | 4.29 | 0.37 | 5.123 | 3.3 | 1.000 | 726,170 |
| 2036 | 3,299 | 60.8% | 39.2% | 2006 | 1294 | 0.01% | 4.31 | 0.37 | 5.123 | 3.3 | 1.000 | 756,270 |
| 2037 | 3,349 | 60.6% | 39.4% | 2029 | 1320 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 1.000 | 787,618 |
| 2038 | 3,399 | 60.4% | 39.6% | 2053 | 1346 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 1.000 | 820,265 |
| 2039 | 3,450 | 60.2% | 39.8% | 2077 | 1373 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 1.000 | 854,265 |
| 2040 | 3,502 | 60.0% | 40.0% | 2101 | 1401 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 1.000 | 889,673 |

5 yr ESALs
2,200,000

10 yr ESALs
5,000,000

15 yr ESALs
8,300,000

20 yr ESALs
12,400,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 5 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 11.8% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 200 | 1.50% | 200 | 260 | 300 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 70 | | 70 | 100 | 120 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 1,000,000

General Comments:

Ramp 5 WK EB to Pennyriple SB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-----|-------|---------|------|--------|-------|------|---------|-------|---------|-------|--------|
| 2020 | 200 | 63.8% | 36.2% | 128 | 72 | 0.00% | 3.99 | 0.29 | 0 | 0 | 1.000 | 30,865 |
| 2021 | 203 | 63.6% | 36.4% | 129 | 74 | 0.00% | 4.01 | 0.30 | 0 | 0 | 1.000 | 32,135 |
| 2022 | 206 | 63.4% | 36.6% | 131 | 75 | 0.00% | 4.03 | 0.30 | 0 | 0 | 1.000 | 33,457 |
| 2023 | 209 | 63.3% | 36.7% | 132 | 77 | 0.00% | 4.05 | 0.30 | 0 | 0 | 1.000 | 34,834 |
| 2024 | 212 | 63.1% | 36.9% | 134 | 78 | 0.00% | 4.07 | 0.31 | 0 | 0 | 1.000 | 36,268 |
| 2025 | 215 | 62.9% | 37.1% | 135 | 80 | 0.00% | 4.09 | 0.31 | 0 | 0 | 1.000 | 37,761 |
| 2026 | 219 | 62.7% | 37.3% | 137 | 82 | 0.00% | 4.11 | 0.32 | 0 | 0 | 1.000 | 39,315 |
| 2027 | 222 | 62.5% | 37.5% | 139 | 83 | 0.00% | 4.12 | 0.32 | 0 | 0 | 1.000 | 40,934 |
| 2028 | 225 | 62.3% | 37.7% | 140 | 85 | 0.00% | 4.14 | 0.33 | 0 | 0 | 1.000 | 42,619 |
| 2029 | 229 | 62.1% | 37.9% | 142 | 87 | 0.00% | 4.16 | 0.34 | 0 | 0 | 1.000 | 44,375 |
| 2030 | 232 | 61.9% | 38.1% | 144 | 88 | 0.00% | 4.18 | 0.34 | 0 | 0 | 1.000 | 46,202 |
| 2031 | 236 | 61.8% | 38.2% | 145 | 90 | 0.00% | 4.20 | 0.35 | 0 | 0 | 1.000 | 48,106 |
| 2032 | 239 | 61.6% | 38.4% | 147 | 92 | 0.00% | 4.22 | 0.35 | 0 | 0 | 1.000 | 50,088 |
| 2033 | 243 | 61.4% | 38.6% | 149 | 94 | 0.00% | 4.24 | 0.36 | 0 | 0 | 1.000 | 52,151 |
| 2034 | 246 | 61.2% | 38.8% | 151 | 96 | 0.00% | 4.27 | 0.36 | 0 | 0 | 1.000 | 54,300 |
| 2035 | 250 | 61.0% | 39.0% | 152 | 98 | 0.00% | 4.29 | 0.37 | 0 | 0 | 1.000 | 56,538 |
| 2036 | 254 | 60.8% | 39.2% | 154 | 100 | 0.00% | 4.31 | 0.37 | 0 | 0 | 1.000 | 58,868 |
| 2037 | 258 | 60.6% | 39.4% | 156 | 102 | 0.00% | 4.33 | 0.38 | 0 | 0 | 1.000 | 61,295 |
| 2038 | 261 | 60.4% | 39.6% | 158 | 104 | 0.00% | 4.35 | 0.39 | 0 | 0 | 1.000 | 63,821 |
| 2039 | 265 | 60.2% | 39.8% | 160 | 106 | 0.00% | 4.37 | 0.39 | 0 | 0 | 1.000 | 66,452 |
| 2040 | 269 | 60.0% | 40.0% | 162 | 108 | 0.00% | 4.39 | 0.40 | 0 | 0 | 1.000 | 69,192 |

5 yr ESALs
200,000

10 yr ESALs
400,000

15 yr ESALs
600,000

20 yr ESALs
1,000,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 6 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 9.6% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 2400 | 1.50% | 2700 | 3090 | 3600 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 840 | | 980 | 1180 | 1440 |
| Percent Trucks Hauling Coal | (%CT) | 1.907% | -1.981% | 1.637% | 1.361% | 1.111% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 12,900,000

General Comments:

Ramp 6 Pennyrile SB to WK EB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 2,700 | 63.8% | 36.2% | 1723 | 977 | 0.01% | 3.99 | 0.29 | 5.123 | 3.3 | 1.000 | 410,315 |
| 2021 | 2,741 | 63.6% | 36.4% | 1743 | 997 | 0.01% | 4.01 | 0.30 | 5.123 | 3.3 | 1.000 | 427,316 |
| 2022 | 2,782 | 63.4% | 36.6% | 1765 | 1017 | 0.01% | 4.03 | 0.30 | 5.123 | 3.3 | 1.000 | 445,022 |
| 2023 | 2,823 | 63.3% | 36.7% | 1786 | 1038 | 0.01% | 4.05 | 0.30 | 5.123 | 3.3 | 1.000 | 463,462 |
| 2024 | 2,866 | 63.1% | 36.9% | 1807 | 1058 | 0.01% | 4.07 | 0.31 | 5.123 | 3.3 | 1.000 | 482,666 |
| 2025 | 2,909 | 62.9% | 37.1% | 1829 | 1080 | 0.01% | 4.09 | 0.31 | 5.123 | 3.3 | 1.000 | 502,667 |
| 2026 | 2,952 | 62.7% | 37.3% | 1851 | 1101 | 0.01% | 4.11 | 0.32 | 5.123 | 3.3 | 1.000 | 523,497 |
| 2027 | 2,997 | 62.5% | 37.5% | 1873 | 1123 | 0.01% | 4.12 | 0.32 | 5.123 | 3.3 | 1.000 | 545,190 |
| 2028 | 3,042 | 62.3% | 37.7% | 1896 | 1146 | 0.01% | 4.14 | 0.33 | 5.123 | 3.3 | 1.000 | 567,782 |
| 2029 | 3,087 | 62.1% | 37.9% | 1918 | 1169 | 0.01% | 4.16 | 0.34 | 5.123 | 3.3 | 1.000 | 591,311 |
| 2030 | 3,133 | 61.9% | 38.1% | 1941 | 1192 | 0.01% | 4.18 | 0.34 | 5.123 | 3.3 | 1.000 | 615,815 |
| 2031 | 3,180 | 61.8% | 38.2% | 1964 | 1216 | 0.01% | 4.20 | 0.35 | 5.123 | 3.3 | 1.000 | 641,335 |
| 2032 | 3,228 | 61.6% | 38.4% | 1987 | 1241 | 0.01% | 4.22 | 0.35 | 5.123 | 3.3 | 1.000 | 667,913 |
| 2033 | 3,277 | 61.4% | 38.6% | 2011 | 1266 | 0.01% | 4.24 | 0.36 | 5.123 | 3.3 | 1.000 | 695,592 |
| 2034 | 3,326 | 61.2% | 38.8% | 2035 | 1291 | 0.01% | 4.27 | 0.36 | 5.123 | 3.3 | 1.000 | 724,418 |
| 2035 | 3,376 | 61.0% | 39.0% | 2059 | 1317 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 1.000 | 754,439 |
| 2036 | 3,426 | 60.8% | 39.2% | 2083 | 1343 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 1.000 | 785,704 |
| 2037 | 3,478 | 60.6% | 39.4% | 2107 | 1370 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 1.000 | 818,265 |
| 2038 | 3,530 | 60.4% | 39.6% | 2132 | 1398 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 1.000 | 852,175 |
| 2039 | 3,583 | 60.2% | 39.8% | 2157 | 1426 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 1.000 | 887,491 |
| 2040 | 3,637 | 60.0% | 40.0% | 2182 | 1455 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 1.000 | 924,270 |

5 yr ESALs
2,300,000

10 yr ESALs
5,200,000

15 yr ESALs
8,600,000

20 yr ESALs
12,900,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 7 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 8.2% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 2300 | 1.50% | 2600 | 2960 | 3400 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 800 | | 940 | 1130 | 1360 |
| Percent Trucks Hauling Coal | (%CT) | 1.617% | -1.928% | 1.381% | 1.154% | 0.956% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 5.123 | 0.00% | 5.123 | 5.123 | 5.123 |
| ESALs/Axle | (ESAL/CA) | 3.3 | 0.00% | 3.300 | 3.300 | 3.300 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 12,500,000

General Comments:

Ramp 7 WK EB to Pennyrile NB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 2,600 | 63.8% | 36.2% | 1659 | 941 | 0.01% | 3.99 | 0.29 | 5.123 | 3.3 | 1.000 | 396,066 |
| 2021 | 2,639 | 63.6% | 36.4% | 1679 | 960 | 0.01% | 4.01 | 0.30 | 5.123 | 3.3 | 1.000 | 412,459 |
| 2022 | 2,679 | 63.4% | 36.6% | 1699 | 979 | 0.01% | 4.03 | 0.30 | 5.123 | 3.3 | 1.000 | 429,530 |
| 2023 | 2,719 | 63.3% | 36.7% | 1720 | 999 | 0.01% | 4.05 | 0.30 | 5.123 | 3.3 | 1.000 | 447,309 |
| 2024 | 2,760 | 63.1% | 36.9% | 1740 | 1019 | 0.01% | 4.07 | 0.31 | 5.123 | 3.3 | 1.000 | 465,825 |
| 2025 | 2,801 | 62.9% | 37.1% | 1761 | 1040 | 0.00% | 4.09 | 0.31 | 5.123 | 3.3 | 1.000 | 485,108 |
| 2026 | 2,843 | 62.7% | 37.3% | 1782 | 1060 | 0.00% | 4.11 | 0.32 | 5.123 | 3.3 | 1.000 | 505,190 |
| 2027 | 2,886 | 62.5% | 37.5% | 1804 | 1082 | 0.00% | 4.12 | 0.32 | 5.123 | 3.3 | 1.000 | 526,104 |
| 2028 | 2,929 | 62.3% | 37.7% | 1825 | 1103 | 0.00% | 4.14 | 0.33 | 5.123 | 3.3 | 1.000 | 547,884 |
| 2029 | 2,973 | 62.1% | 37.9% | 1847 | 1126 | 0.00% | 4.16 | 0.34 | 5.123 | 3.3 | 1.000 | 570,566 |
| 2030 | 3,017 | 61.9% | 38.1% | 1869 | 1148 | 0.00% | 4.18 | 0.34 | 5.123 | 3.3 | 1.000 | 594,189 |
| 2031 | 3,063 | 61.8% | 38.2% | 1891 | 1171 | 0.00% | 4.20 | 0.35 | 5.123 | 3.3 | 1.000 | 618,789 |
| 2032 | 3,109 | 61.6% | 38.4% | 1914 | 1195 | 0.00% | 4.22 | 0.35 | 5.123 | 3.3 | 1.000 | 644,409 |
| 2033 | 3,155 | 61.4% | 38.6% | 1936 | 1219 | 0.00% | 4.24 | 0.36 | 5.123 | 3.3 | 1.000 | 671,091 |
| 2034 | 3,203 | 61.2% | 38.8% | 1959 | 1243 | 0.00% | 4.27 | 0.36 | 5.123 | 3.3 | 1.000 | 698,877 |
| 2035 | 3,251 | 61.0% | 39.0% | 1982 | 1268 | 0.00% | 4.29 | 0.37 | 5.123 | 3.3 | 1.000 | 727,814 |
| 2036 | 3,299 | 60.8% | 39.2% | 2006 | 1294 | 0.00% | 4.31 | 0.37 | 5.123 | 3.3 | 1.000 | 757,951 |
| 2037 | 3,349 | 60.6% | 39.4% | 2029 | 1320 | 0.00% | 4.33 | 0.38 | 5.123 | 3.3 | 1.000 | 789,335 |
| 2038 | 3,399 | 60.4% | 39.6% | 2053 | 1346 | 0.00% | 4.35 | 0.39 | 5.123 | 3.3 | 1.000 | 822,020 |
| 2039 | 3,450 | 60.2% | 39.8% | 2077 | 1373 | 0.00% | 4.37 | 0.39 | 5.123 | 3.3 | 1.000 | 856,058 |
| 2040 | 3,502 | 60.0% | 40.0% | 2101 | 1401 | 0.00% | 4.39 | 0.40 | 5.123 | 3.3 | 1.000 | 891,506 |

5 yr ESALs
2,200,000

10 yr ESALs
5,000,000

15 yr ESALs
8,300,000

20 yr ESALs
12,500,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

| | | | |
|---------------------|------------------------------|--------------|------------------|
| County | Hopkins | Date | 02/21/13 |
| Road Name | Interchange Ramp | Forecaster | LAW |
| Functional Class | 2 - Rural Principal Arterial | MARS No. | - |
| Project Description | Item No. 2-225.00 | Item No. | 2-225.00 |
| Scenario | Traffic Forecast | Route No. | Interchange Ramp |
| Segment Description | 2040 Ramp 8 | Beg. MP | |
| | | End MP | |
| | | T.F. No. | - |
| | | No. of Lanes | 1 |
| | | 1 or 2 way | 1 |

REFERENCES:

| | | | |
|--------------------------|-------------------------------|-----------------|-----------------|
| Previous Forecasts | None | K- Factor Value | 8.4% |
| Traffic Volume Milepoint | ADT Growth Rate - | K-Factor Source | ADT Growth Rate |
| Truck Percent Milepoint | Classification Count N / A | PHF | 0.85 |
| ESAL Information | | | |
| Growth Rate | 1.50% | | |

TRAFFIC PARAMETERS:

| | | Present Year | Growth Rate | Construction Year | Median Year | Design Year |
|-----------------------------|-----------|--------------|-------------|-------------------|-------------|-------------|
| | | 2013 | | 2020 | 2030 | 2040 |
| Volume | (AADT) | 1700 | 1.50% | 1900 | 2190 | 2500 |
| Percent Trucks | (%T) | 35.0% | 0.5% | 36.2% | 38.1% | 40.0% |
| Number of Trucks | | 590 | | 690 | 830 | 1000 |
| Percent Trucks Hauling Coal | (%CT) | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| <i>Non-Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/T) | 3.858 | 0.48% | 3.989 | 4.184 | 4.389 |
| ESALs/Axle | (ESAL/A) | 0.260 | 1.60% | 0.291 | 0.341 | 0.399 |
| <i>Coal Trucks:</i> | | | | | | |
| Axles/Truck | (A/CT) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |
| ESALs/Axle | (ESAL/CA) | 0 | 0.00% | 0.000 | 0.000 | 0.000 |

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 9,200,000

General Comments:

Ramp 8 Pennyrile to WK EB (2040)

| Year | ADT | Car % | Truck % | Cars | Trucks | CT% | AX/T | ESAL/AX | AX/CT | ESAL/CA | LDF | ESALs |
|------|-------|-------|---------|------|--------|-------|------|---------|-------|---------|-------|---------|
| 2020 | 1,900 | 63.8% | 36.2% | 1212 | 688 | 0.00% | 3.99 | 0.29 | 0 | 0 | 1.000 | 293,219 |
| 2021 | 1,929 | 63.6% | 36.4% | 1227 | 702 | 0.00% | 4.01 | 0.30 | 0 | 0 | 1.000 | 305,283 |
| 2022 | 1,957 | 63.4% | 36.6% | 1242 | 716 | 0.00% | 4.03 | 0.30 | 0 | 0 | 1.000 | 317,844 |
| 2023 | 1,987 | 63.3% | 36.7% | 1257 | 730 | 0.00% | 4.05 | 0.30 | 0 | 0 | 1.000 | 330,923 |
| 2024 | 2,017 | 63.1% | 36.9% | 1272 | 745 | 0.00% | 4.07 | 0.31 | 0 | 0 | 1.000 | 344,543 |
| 2025 | 2,047 | 62.9% | 37.1% | 1287 | 760 | 0.00% | 4.09 | 0.31 | 0 | 0 | 1.000 | 358,726 |
| 2026 | 2,078 | 62.7% | 37.3% | 1303 | 775 | 0.00% | 4.11 | 0.32 | 0 | 0 | 1.000 | 373,494 |
| 2027 | 2,109 | 62.5% | 37.5% | 1318 | 791 | 0.00% | 4.12 | 0.32 | 0 | 0 | 1.000 | 388,872 |
| 2028 | 2,140 | 62.3% | 37.7% | 1334 | 806 | 0.00% | 4.14 | 0.33 | 0 | 0 | 1.000 | 404,885 |
| 2029 | 2,172 | 62.1% | 37.9% | 1350 | 823 | 0.00% | 4.16 | 0.34 | 0 | 0 | 1.000 | 421,560 |
| 2030 | 2,205 | 61.9% | 38.1% | 1366 | 839 | 0.00% | 4.18 | 0.34 | 0 | 0 | 1.000 | 438,923 |
| 2031 | 2,238 | 61.8% | 38.2% | 1382 | 856 | 0.00% | 4.20 | 0.35 | 0 | 0 | 1.000 | 457,004 |
| 2032 | 2,272 | 61.6% | 38.4% | 1399 | 873 | 0.00% | 4.22 | 0.35 | 0 | 0 | 1.000 | 475,831 |
| 2033 | 2,306 | 61.4% | 38.6% | 1415 | 891 | 0.00% | 4.24 | 0.36 | 0 | 0 | 1.000 | 495,437 |
| 2034 | 2,340 | 61.2% | 38.8% | 1432 | 909 | 0.00% | 4.27 | 0.36 | 0 | 0 | 1.000 | 515,852 |
| 2035 | 2,375 | 61.0% | 39.0% | 1449 | 927 | 0.00% | 4.29 | 0.37 | 0 | 0 | 1.000 | 537,110 |
| 2036 | 2,411 | 60.8% | 39.2% | 1466 | 945 | 0.00% | 4.31 | 0.37 | 0 | 0 | 1.000 | 559,247 |
| 2037 | 2,447 | 60.6% | 39.4% | 1483 | 964 | 0.00% | 4.33 | 0.38 | 0 | 0 | 1.000 | 582,299 |
| 2038 | 2,484 | 60.4% | 39.6% | 1500 | 984 | 0.00% | 4.35 | 0.39 | 0 | 0 | 1.000 | 606,303 |
| 2039 | 2,521 | 60.2% | 39.8% | 1518 | 1003 | 0.00% | 4.37 | 0.39 | 0 | 0 | 1.000 | 631,299 |
| 2040 | 2,559 | 60.0% | 40.0% | 1535 | 1024 | 0.00% | 4.39 | 0.40 | 0 | 0 | 1.000 | 657,327 |

5 yr ESALs
1,700,000

10 yr ESALs
3,700,000

15 yr ESALs
6,200,000

20 yr ESALs
9,200,000

APPENDIX J

General Decision Number: KY130102 09/20/2013 KY102

Superseded General Decision Number: KY20120127

State: Kentucky

Construction Type: Highway

Counties: Allen, Ballard, Butler, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Edmonson, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Logan, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Simpson, Todd, Trigg, Union, Warren and Webster Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

| Modification Number | Publication Date |
|---------------------|------------------|
| 0 | 01/04/2013 |
| 1 | 02/01/2013 |
| 2 | 04/05/2013 |
| 3 | 04/26/2013 |
| 4 | 05/03/2013 |
| 5 | 05/31/2013 |
| 6 | 06/07/2013 |
| 7 | 06/14/2013 |
| 8 | 06/21/2013 |
| 9 | 06/28/2013 |
| 10 | 07/05/2013 |
| 11 | 07/26/2013 |
| 12 | 08/09/2013 |
| 13 | 09/20/2013 |

BRIN0004-002 06/01/2011

BALLARD, BUTLER, CALDWELL, CARLISLE, CRITTENDEN, DAVIESS, EDMONSON, FULTON, GRAVES, HANCOCK, HENDERSON, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, MCLEAN, MUHLENBERG, OHIO, UNION, and WEBSTER COUNTIES

Rates Fringes

BRICKLAYER

| | | |
|---|----------|-------|
| Ballard, Caldwell, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, Marshall, and McCracken Counties..... | \$ 24.11 | 10.30 |
| Butler, Edmonson, Hopkins, Muhlenberg, and Ohio Counties..... | \$ 24.61 | 10.22 |
| Daviess, Hancock, | | |

Henderson, McLean, Union,
and Webster Counties.....\$ 28.47 12.78

BRTN0004-005 05/01/2009

ALLEN, CALLOWAY, CHRISTIAN, LOGAN, SIMPSON, TODD, TRIGG, and
WARREN COUNTIES

| | Rates | Fringes |
|-----------------|----------|---------|
| BRICKLAYER..... | \$ 24.52 | 1.83 |

CARP0357-002 04/01/2013

| | Rates | Fringes |
|--------------------|----------|---------|
| CARPENTER..... | \$ 26.90 | 14.42 |
| Diver..... | \$ 40.73 | 14.42 |
| PILEDRIVERMAN..... | \$ 27.15 | 14.42 |

ELEC0369-006 05/29/2013

BUTLER, EDMONSON, LOGAN, TODD & WARREN COUNTIES:

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 29.48 | 14.37 |

ELEC0429-001 02/01/2010

ALLEN & SIMPSON COUNTIES:

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 21.85 | 10.35 |

ELEC0816-002 06/01/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
FULTON (Except a 5 mile radius of City Hall in Fulton), GRAVES,
HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES:

| | Rates | Fringes |
|------------------|----------|------------|
| ELECTRICIAN..... | \$ 30.40 | 25.5%+5.60 |

Cable spicers receive \$.25 per hour additional.

ELEC1701-003 06/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO,
UNION & WEBSTER COUNTIES:

| | Rates | Fringes |
|------------------|----------|---------|
| ELECTRICIAN..... | \$ 30.03 | 13.72 |

Cable spicers receive \$.25 per hour additional.

 ELEC1925-002 06/01/2012

FULTON COUNTY (Up to a 5 mile radius of City Hall in Fulton):

| | Rates | Fringes |
|--------------------|----------|---------|
| CABLE SPLICER..... | \$ 25.00 | 10.27 |
| ELECTRICIAN..... | \$ 25.00 | 10.43 |

 ENGI0181-017 07/01/2013

| | Rates | Fringes |
|---------------------|----------|---------|
| Operating Engineer: | | |
| GROUP 1..... | \$ 28.00 | 13.90 |
| GROUP 2..... | \$ 25.45 | 13.90 |
| GROUP 3..... | \$ 25.85 | 13.90 |
| GROUP 4..... | \$ 25.17 | 13.90 |

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller; Batcher Plant; Bituminous Paver; Bituminous Transfer Machine; Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carry Deck Crane; Central Compressor Plant; Cherry Picker; Clamshell; Concrete Mixer (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurrries; Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Type Machine; Hoist (Two or More Drums); Hoisting Engine (Two or More Drums); Horizontal Directional Drill Operator; Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mechanic; Mechanically Operated Laser Screed; Mechanic Welder; Mucking Machine; Motor Scraper; Orangepeel Bucket; Overhead Crane; Piledriver; Power Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to equipment; Rotary Drill; Roller (Bituminous); Rough Terrain Crane; Scarifier; Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom; Telescoping Type Forklift; Tow or Push Boat; Tower Crane (French, German & other types); Tractor Shovel; Truck Crane; Tunnel Mining Machines, including Moles, Shields or similar types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.); Bituminous Mixer; Boom Type Tamping Machine; Bull Float; Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric Vibrator; Compactor/Self-Propelled Compactor; Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Concrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger;

Welding Machine; Well Points;& Whirley Oiler

GROUP 3 -All Off Road Material Handling Equipment, including Articulating Dump Trucks; Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling equals or exceeds 150 ft. - \$1.00 above Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WORK.

IRON0070-005 06/01/2013

BUTLER COUNTY (Eastern eighth, including the Townships of Decker, Lee & Tilford);
EDMONSON COUNTY (Northern three-fourths, including the Townships of Asphalt, Bee Spring, Brownsville, Grassland, Huff, Kyrock, Lindseyville, Mammoth Cave, Ollie, Prosperity, Rhoda, Sunfish & Sweden)

| | Rates | Fringes |
|-------------------------|----------|---------|
| Ironworkers: | | |
| Structural; Ornamental; | | |
| Reinforcing; Precast | | |
| Concrete Erectors..... | \$ 26.47 | 19.30 |

IRON0103-004 04/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, OHIO, UNION & WEBSTER COUNTIES
BUTLER COUNTY (Townships of Aberdeen, Bancock, Casey, Dexterville, Dunbar, Elfie, Gilstrap, Huntsville, Logansport, Monford, Morgantown, Provo, Rochester, South Hill & Welchs Creek);
CALDWELL COUNTY (Northeastern third, including the Township of Creswell);
CHRISTIAN COUNTY (Northern third, including the Townships of Apex, Crofton, Kelly, Mannington & Wynns);
CRITTENDEN COUNTY (Northeastern half, including the Townships of Grove, Mattoon, Repton, Shady Grove & Tribune);
MUHLENBERG COUNTY (Townships of Bavier, Beech Creek Junction, Benton, Brennen, Browder, Central City, Cleaton, Depoy, Drakesboro, Eunis, Graham, Hillside, Luzerne, Lynn City, Martwick, McNary, Millport, Moorman, Nelson, Paradise, Powderly, South Carrollton, Tarina & Weir)

| | Rates | Fringes |
|-------------------------|----------|---------|
| Ironworkers:..... | \$ 27.82 | 16.555 |
| ----- | | |
| IRON0492-003 05/01/2012 | | |

ALLEN, LOGAN, SIMPSON, TODD & WARREN COUNTIES
 BUTLER COUNTY (Southern third, including the Townships of Boston, Berrys Lick, Dimple, Jetson, Quality, Sharer, Sugar Grove & Woodbury);
 CHRISTIAN COUNTY (Eastern two-thirds, including the Townships of Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
 EDMONSON COUNTY (Southern fourth, including the Townships of Chalybeate & Rocky Hill);
 MUHLENBERG COUNTY (Southern eighth, including the Townships of Dunnior, Penrod & Rosewood)

| | Rates | Fringes |
|-------------------------|----------|---------|
| Ironworkers:..... | \$ 23.00 | 10.70 |
| ----- | | |
| IRON0782-006 05/01/2013 | | |

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES
 CALDWELL COUNTY (Southwestern two-thirds, including the Townships of Cedar Bluff, Cider, Claxton, Cobb, Crowtown, Dulaney, Farmersville, Fredonia, McGowan, Otter Pond & Princeton);
 CHRISTIAN COUNTY (Western third, Excluding the Townships of Apex, Crofton, Kelly, Mannington, Wynns, Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
 CRITTENDEN COUNTY (Southwestern half, including the Townships of Crayne, Dycusburg, Frances, Marion, Mexico, Midway, Sheridan & Told)

| | Rates | Fringes |
|--|----------|---------|
| Ironworkers: | | |
| Projects with a total contract cost of | | |
| \$20,000,000.00 or above..... | \$ 26.46 | 19.91 |
| All Other Work..... | \$ 24.95 | 18.65 |
| ----- | | |
| LABO0189-005 07/01/2013 | | |

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL & MCCRACKEN COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 20.95 | 12.01 |
| GROUP 2..... | \$ 21.20 | 12.01 |

| | | |
|--------------|----------|-------|
| GROUP 3..... | \$ 21.25 | 12.01 |
| GROUP 4..... | \$ 21.85 | 12.01 |

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0189-006 07/01/2013

ALLEN, BUTLER, CALDWELL, CHRISTIAN, DAVIESS, EDMONSON, HANCOCK, HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, SIMPSON, TODD, TRIGG & WARREN COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 21.96 | 11.00 |
| GROUP 2..... | \$ 22.21 | 11.00 |
| GROUP 3..... | \$ 22.26 | 11.00 |
| GROUP 4..... | \$ 22.86 | 11.00 |

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0561-001 07/01/2013

CRITTENDEN, HENDERSON, UNION & WEBSTER COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| Laborers: | | |
| GROUP 1..... | \$ 21.11 | 12.25 |
| GROUP 2..... | \$ 21.36 | 12.25 |
| GROUP 3..... | \$ 21.41 | 12.25 |
| GROUP 4..... | \$ 22.01 | 12.25 |

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway

Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

 PAIN0032-002 05/01/2013

BALLARD COUNTY

| | Rates | Fringes |
|---------------------|----------|---------|
| Painters: | | |
| Bridges..... | \$ 30.56 | 15.18 |
| All Other Work..... | \$ 28.26 | 15.18 |

Spray, Blast, Steam, High & Hazardous (Including Lead Abatement) and All Epoxy - \$1.00 Premium

 PAIN0118-003 05/01/2010

EDMONSON COUNTY:

| | Rates | Fringes |
|---|----------|---------|
| Painters: | | |
| Brush & Roller..... | \$ 18.50 | 10.30 |
| Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning..... | \$ 19.50 | 10.30 |

 PAIN0156-006 04/01/2010

DAVISS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION & WEBSTER
COUNTIES

| | Rates | Fringes |
|-----------------|----------|---------|
| Painters: | | |
| BRIDGES | | |
| GROUP 1..... | \$ 25.60 | 10.05 |
| GROUP 2..... | \$ 25.85 | 10.05 |
| GROUP 3..... | \$ 26.60 | 10.05 |
| GROUP 4..... | \$ 27.60 | 10.05 |
| ALL OTHER WORK: | | |
| GROUP 1..... | \$ 25.60 | 11.30 |
| GROUP 2..... | \$ 25.85 | 11.30 |
| GROUP 3..... | \$ 26.60 | 11.30 |
| GROUP 4..... | \$ 27.60 | 11.30 |

PAINTER CLASSIFICATIONS

GROUP 1 - Brush & Roller

GROUP 2 - Plasterers

GROUP 3 - Spray; Sandblast; Power Tools; Waterblast;
Steamcleaning; Brush & Roller of Mastics, Creosotes, Kwinch
Koate & Coal Tar Epoxy

GROUP 4 - Spray of Mastics, Creosotes, Kwinch Koate & Coal
Tar Epoxy

PAIN0456-003 07/01/2011

ALLEN, BUTLER, LOGAN, MUHLENBERG, SIMPSON, TODD & WARREN
COUNTIES:

| | Rates | Fringes |
|---|----------|---------|
| Painters: | | |
| BRIDGES | | |
| Brush & Roller..... | \$ 22.55 | 9.65 |
| Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning..... | \$ 23.55 | 9.65 |
| ALL OTHER WORK | | |
| Brush & Roller..... | \$ 17.55 | 9.65 |
| Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning..... | \$ 18.55 | 9.65 |

ALL OTHER WORK - HIGH TIME PAY

Over 35 feet (up to 100 feet) - \$1.00 above base wage
100 feet and over - \$2.00 above base wage

DURING SPRAY PAINTING AND SANDBLASTING OPERATIONS, POT
TENDERS SHALL RECEIVE THE SAME WAGE RATES AS THE SPRAY
PAINTER OR NOZZLE OPERATOR

 PAIN0500-002 07/01/2013

CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON,
 GRAVES, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN
 & TRIGG COUNTIES:

| | Rates | Fringes |
|---------------------|----------|---------|
| Painters: | | |
| Bridges..... | \$ 25.80 | 11.95 |
| All Other Work..... | \$ 19.55 | 11.95 |

Waterblasting units with 3500 PSI and above - \$.50 premium
 Spraypainting and all abrasive blasting - \$1.00 premium
 Work 40 ft. and above ground level - \$1.00 premium

 PLUM0184-002 07/01/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
 FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN
 and TRIGG COUNTIES

| | Rates | Fringes |
|---------------------------|----------|---------|
| Plumber; Steamfitter..... | \$ 33.11 | 14.83 |

 * PLUM0502-004 08/01/2013

ALLEN, BUTLER, EDMONSON, SIMPSON & WARREN

| | Rates | Fringes |
|---------------------------|----------|---------|
| Plumber; Steamfitter..... | \$ 32.00 | 17.17 |

 PLUM0633-002 08/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, LOGAN, MCLEAN,
 MUHLENBERG, OHIO, TODD, UNION & WEBSTER COUNTIES:

| | Rates | Fringes |
|-------------------------|----------|---------|
| PLUMBER/PIPEFITTER..... | \$ 29.87 | 14.25 |

 TEAM0089-003 03/31/2013

ALLEN, BUTLER, EDMONSON, LOGAN, SIMPSON & WARREN COUNTIES

| | Rates | Fringes |
|----------------|----------|---------|
| Truck drivers: | | |
| Zone 1: | | |
| Group 1..... | \$ 19.38 | 16.85 |
| Group 2..... | \$ 19.56 | 16.85 |
| Group 3..... | \$ 19.64 | 16.85 |

Group 4.....\$ 19.66 16.85

GROUP 1 - Greaser; Tire Changer

GROUP 2 - Truck Mechanic; Single Axle Dump; Flat Bed; All Terrain Vehicles when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors

GROUP 3 - Mixer All Types

GROUP 4 - Winch and A-Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker; Euclid and Other Heavy Earth Moving Equipment; Low Boy; Articulator Cat; Five Axle Vehicle

TEAM0215-003 03/31/2013

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO & WEBSTER COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| TRUCK DRIVER | | |
| Group 1..... | \$ 20.93 | 16.85 |
| Group 2..... | \$ 21.16 | 16.85 |
| Group 3..... | \$ 21.23 | 16.85 |
| Group 4..... | \$ 21.24 | 16.85 |

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors; Mixer All Types

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; 5 Axle Vehicle; Winch and A- Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker

TEAM0236-001 03/31/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, TODD & TRIGG COUNTIES

| | Rates | Fringes |
|--------------|----------|---------|
| TRUCK DRIVER | | |
| Group 1..... | \$ 19.38 | 16.85 |
| Group 2..... | \$ 19.56 | 16.85 |

| | | |
|--------------|----------|-------|
| Group 3..... | \$ 19.56 | 16.85 |
| Group 4..... | \$ 19.66 | 16.85 |
| Group 5..... | \$ 19.64 | 16.85 |

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Drivers of Distributors

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; Five Axle Vehicle; Winch and A-Frame when used in transporting materials; Ross Carrier

GROUP 5: Mixer All Types

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator

(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

These rates are listed pursuant to the Kentucky Determination No. CR-13-I-HWY dated April 15, 2013.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Ryan Griffith, Acting Director
Division of Construction Procurement
Frankfort, Kentucky 40622

INSURANCE

The Contractor shall procure and maintain the following insurance in addition to the insurance required by law:

- 1) Commercial General Liability-Occurrence form – not less than \$2,000,000 General aggregate, \$2,000,000 Products & Completed Aggregate, \$1,000,000 Personal & Advertising, \$1,000,000 each occurrence.
- 2) Automobile Liability- \$1,000,000 per accident
- 3) Employers Liability:
 - a) \$100,000 Each Accident Bodily Injury
 - b) \$500,000 Policy limit Bodily Injury by Disease
 - c) \$100,000 Each Employee Bodily Injury by Disease
- 4) The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
 - a) "policy contains no deductible clauses."
 - b) "policy contains _____ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
- 5) KENTUCKY WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

The cost of insurance is incidental to all contract items. All subcontractors must meet the same minimum insurance requirements.

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(Executive Order 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

| GOALS FOR MINORITY PARTICIPATION IN EACH TRADE | GOALS FOR FEMALE PARTICIPATION IN EACH TRADE |
|---|---|
| 3.5% | 6.9% |

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non -federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60 -4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4, 3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60 -4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. The notification shall be mailed to:

**Evelyn Teague, Regional Director
Office of Federal Contract Compliance Programs
61 Forsyth Street, SW, Suite 7B75
Atlanta, Georgia 30303-8609**

4. As used in this Notice, and in the contract resulting from this solicitation, the "**covered area**" is Hopkins County.

APPENDIX K

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the September 27, 2013 Letting**

| | |
|--------------------|---|
| Subsection: | 108.03 Preconstruction Conference. |
| Revision: | Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky. |
| Subsection: | 109.07.02 Fuel. |
| Revision: | Revise item Crushed Aggregate Used for Embankment Stabilization to the following: Crushed Aggregate Used for Stabilization of Unsuitable Materials Used for Embankment Stabilization |
| Subsection: | 110.02 Demobilization. |
| Revision: | Replace the first part of the first sentence of the second paragraph with the following: Perform all work and operations necessary to accomplish final clean-up as specified in the first paragraph of Subsection 105.12; |
| Subsection: | 112.03.12 Project Traffic Coordinator (PTC). |
| Revision: | Replace the last paragraph of this subsection with the following: Ensure the designated PTC has sufficient skill and experience to properly perform the task assigned and has successfully completed the qualification courses. |
| Subsection: | 112.04.18 Diversions (By-Pass Detours). |
| Revision: | Insert the following sentence after the 2nd sentence of this subsection. The Department will not measure temporary drainage structures for payment when the contract documents provide the required drainage opening that must be maintained with the diversion. The temporary drainage structures shall be incidental to the construction of the diversion. If the contract documents fail to provide the required drainage opening needed for the diversion, the cost of the temporary drainage structure will be handled as extra work in accordance with section 109.04. |
| Subsection: | 201.03.01 Contractor Staking. |
| Revision: | Replace the first paragraph with the following: Perform all necessary surveying under the general supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky. |
| Subsection: | 201.04.01 Contractor Staking. |
| Revision: | Replace the last sentence of the paragraph with the following: Complete the general layout of the project under the supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky. |
| Subsection: | 206.04.01 Embankment-in-Place. |
| Revision: | Replace the fourth paragraph with the following: The Department will not measure suitable excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place. |
| Subsection: | 208.02.01 Cement. |
| Revision: | Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work. |

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the September 27, 2013 Letting**

| | |
|--------------------|--|
| Subsection: | 208.03.06 Curing and Protection. |
| Revision: | Replace the fourth paragraph with the following: Do not allow traffic or equipment on the finished surface until the stabilized subgrade has cured for a total of 7-days with an ambient air temperature above 40 degrees Fahrenheit. A curing day consists of a continuous 24-hour period in which the ambient air temperature does not fall below 40 degrees Fahrenheit. Curing days will not be calculated consecutively, but must total seven (7) , 24-hour days with the ambient air temperature remaining at or above 40 degrees Fahrenheit before traffic or equipment will be allowed to traverse the stabilized subgrade. The Department may allow a shortened curing period when the Contractor requests. The Contractor shall give the Department at least 3 day notice of the request for a shortened curing period. The Department will require a minimum of 3 curing days after final compaction. The Contractor shall furnish cores to the treated depth of the roadbed at 500 feet intervals for each lane when a shortened curing time is requested. The Department will test cores using an unconfined compression test. Roadbed cores must achieve a minimum strength requirement of 80 psi. |
| Subsection: | 208.03.06 Curing and Protection. |
| Revision: | Replace paragraph nine with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing. |
| Subsection: | 212.03.03 Permanent Seeding and Protection. |
| Part: | A) Seed Mixtures for Permanent Seeding. |
| Number: | 2) |
| Revision: | Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre. If adjacent to a golf course replace the crown vetch with Kentucky 31 Tall Fescue. |
| Subsection: | 212.03.03 Permanent Seeding and Protection. |
| Part: | A) Seed Mixtures for Permanent Seeding. |
| Number: | 3) |
| Revision: | Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre. If adjacent to crop land or golf course, replace the Sericea Lespedeza with Kentucky 31 Fescue. |
| Subsection: | 213.03.02 Progress Requirements. |
| Revision: | Replace the last sentence of the third paragraph with the following: Additionally, the Department will apply a penalty equal to the liquidated damages when all aspects of the work are not coordinated in an acceptable manner within 7 calendar days after written notification. |
| Subsection: | 213.03.05 Temporary Control Measures. |
| Part: | E) Temporary Seeding and Protection. |
| Revision: | Delete the second sentence of the first paragraph. |
| Subsection: | 304.02.01 Physical Properties. |
| Table: | Required Geogrid Properties |
| Revision: | Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737. |

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| Subsection: | 402.03.02 Contractor Quality Control and Department Acceptance. |
| Part: | B) Sampling. |
| Revision: | Replace the second sentence with the following: The Department will determine when to obtain the quality control samples using the random-number feature of the mix design submittal and approval spreadsheet. The Department will randomly determine when to obtain the verification samples required in Subsections 402.03.03 and 402.03.04 using the Asphalt Mixture Sample Random Tonnage Generator. |
| Subsection: | 402.03.02 Contractor Quality Control and Department Acceptance. |
| Part: | D) Testing Responsibilities. |
| Number: | 3) VMA. |
| Revision: | Add the following paragraph below Number 3) VMA: Retain the AV/VMA specimens and one additional corresponding G_{mm} sample for 5 working days for mixture verification testing by the Department. For Specialty Mixtures, retain a mixture sample for 5 working days for mixture verification testing by the Department. When the Department's test results do not verify that the Contractor's quality control test results are within the acceptable tolerances according to Subsection 402.03.03, retain the samples and specimens from the affected subplot(s) for the duration of the project. |
| Subsection: | 402.03.02 Contractor Quality Control and Department Acceptance. |
| Part: | D) Testing Responsibilities. |
| Number: | 4) Density. |
| Revision: | Replace the second sentence of the Option A paragraph with the following: Perform coring by the end of the following work day. |
| Subsection: | 402.03.02 Contractor Quality Control and Department Acceptance. |
| Part: | D) Testing Responsibilities. |
| Number: | 5) Gradation. |
| Revision: | Delete the second paragraph. |
| Subsection: | 402.03.02 Contractor Quality Control and Department Acceptance. |
| Part: | H) Unsatisfactory Work. |
| Number: | 1) Based on Lab Data. |
| Revision: | Replace the second paragraph with the following: When the Engineer determines that safety concerns or other considerations prohibit an immediate shutdown, continue work and the Department will make an evaluation of acceptability according to Subsection 402.03.05. |

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| Subsection: Revision: | 402.03.03 Verification. Replace the first paragraph with the following: 402.03.03 Mixture Verification. For volumetric properties, the Department will perform a minimum of one verification test for AC, AV, and VMA according to the corresponding procedures as given in Subsection 402.03.02. The Department will randomly determine when to obtain the verification sample using the Asphalt Mixture Sample Random Tonnage Generator. For specialty mixtures, the Department will perform one AC and one gradation determination per lot according to the corresponding procedures as given in Subsection 402.03.02. However, Department personnel will not perform AC determinations according to KM 64-405. The Contractor will obtain a quality control sample at the same time the Department obtains the mixture verification sample and perform testing according to the procedures given in Subsection 402.03.02. If the Contractor's quality control sample is verified by the Department's test results within the tolerances provided below, the Contractor's sample will serve as the quality control sample for the affected subplot. The Department may perform the mixture verification test on the Contractor's equipment or on the Department's equipment. |
| Subsection: Part: Revision: | 402.03.03 Verification. A) Evaluation of Subplot(s) Verified by Department. Replace the third sentence of the second paragraph with the following: When the paired <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate. |
| Subsection: Part: Revision: | 402.03.03 Verification. B) Evaluation of Subplots Not Verified by Department. Replace the third sentence of the first paragraph with the following: When differences between test results are not within the tolerances listed below, the Department will resolve the discrepancy according to Subsection 402.03.05. |
| Subsection: Part: Revision: | 402.03.03 Verification. B) Evaluation of Subplots Not Verified by Department. Replace the third sentence of the second paragraph with the following: When the <i>F</i> -test or <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate. |
| Subsection: Part: Revision: | 402.03.03 Verification. C) Test Data Patterns. Replace the second sentence with the following: When patterns indicate substantial differences between the verified and non-verified subplots, the Department will perform further comparative testing according to subsection 402.03.05. |

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| Subsection: | 402.03 CONSTRUCTION. |
| Revision: | Add the following subsection: 402.03.04 Testing Equipment and Technician Verification. For mixtures with a minimum quantity of 20,000 tons and for every 20,000 tons thereafter, the Department will obtain an additional verification sample at random using the Asphalt Mixture Sample Random Tonnage Generator in order to verify the integrity of the Contractor's and Department's laboratory testing equipment and technicians. The Department will obtain a mixture sample of at least 150 lb at the asphalt mixing plant according to KM 64-425 and split it according to AASHTO R 47. The Department will retain one split portion of the sample and provide the other portion to the Contractor. At a later time convenient to both parties, the Department and Contractor will simultaneously reheat the sample to the specified compaction temperature and test the mixture for AV and VMA using separate laboratory equipment according to the corresponding procedures given in Subsection 402.03.02. The Department will evaluate the differences in test results between the two laboratories. When the difference between the results for AV or VMA is not within ± 2.0 percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05. |
| Subsection: | 402.03.04 Dispute Resolution. |
| Revision: | Change the subsection number to 402.03.05. |
| Subsection: | 402.05 PAYMENT. |
| Part: | Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures |
| Table: | AC |
| Revision: | Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to ± 0.6 . |
| Subsection: | 403.02.10 Material Transfer Vehicle (MTV). |
| Revision: | Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics: |
| Subsection: | 412.02.09 Material Transfer Vehicle (MTV). |
| Revision: | Replace the paragraph with the following: Provide and utilize a MTV with the minimum characteristics outlined in section 403.02.10. |
| Subsection: | 412.03.07 Placement and Compaction. |
| Revision: | Replace the first paragraph with the following: Use a MTV when placing SMA mixture in the driving lanes. The MTV is not required on ramps and/or shoulders unless specified in the contract. When the Engineer determines the use of the MTV is not practical for a portion of the project, the Engineer may waive its requirement for that portion of pavement by a letter documenting the waiver. |
| Subsection: | 412.04 MEASUREMENT. |
| Revision: | Add the following subsection: 412.04.03. Material Transfer Vehicle (MTV). The Department will not measure the MTV for payment and will consider its use incidental to the asphalt mixture. |

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| Subsection: | 501.03.19 Surface Tolerances and Testing Surface. |
| Part: | B) Ride Quality. |
| Revision: | Add the following to the end of the first paragraph: The Department will specify if the ride quality requirements are Category A or Category B when ride quality is specified in the Contract. Category B ride quality requirements shall apply when the Department fails to classify which ride quality requirement will apply to the Contract. |
| Subsection: | 603.03.06 Cofferdams. |
| Revision: | Replace the seventh sentence of paragraph one with the following: Submit drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. |
| Subsection: | 605.03.04 Tack Welding. |
| Revision: | Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding. |
| Subsection: | 606.03.17 Special Requirements for Latex Concrete Overlays. |
| Part: | A) Existing Bridges and New Structures. |
| Number: | 1) Prewetting and Grout-Bond Coat. |
| Revision: | Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition. |
| Subsection: | 609.03 Construction. |
| Revision: | Replace Subsection 609.03.01 with the following: 609.03.01 A) Swinging the Spans. Before placing concrete slabs on steel spans or precast concrete release the temporary erection supports under the bridge and swing the span free on its supports. 609.03.01 B) Lift Loops. Cut all lift loops flush with the top of the precast beam once the beam is placed in the final location and prior to placing steel reinforcement. At locations where lift loops are cut, paint the top of the beam with galvanized or epoxy paint. |
| Subsection: | 611.03.02 Precast Unit Construction. |
| Revision: | Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, replacing Table 1 (Design Requirements for Precast Concrete Box Sections Under Earth, Dead and HL-93 Live Load Conditions) with KY Table 1 (Precast Culvert KYHL-93 Design Table) , and Section 605 with the following exceptions and additions: |
| Subsection: | 613.03.01 Design. |
| Number: | 2) |
| Revision: | Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications" |
| Subsection: | 615.06.02 |
| Revision: | Add the following sentence to the end of the subsection. The ends of units shall be normal to walls and centerline except exposed edges shall be beveled $\frac{3}{4}$ inch. |
| Subsection: | 615.06.03 Placement of Reinforcement in Precast 3-Sided Units. |
| Revision: | Replace the reference of 6.6 in the section to 615.06.06. |
| Subsection: | 615.06.04 Placement of Reinforcement for Precast Endwalls. |
| Revision: | Replace the reference of 6.7 in the section to 615.06.07. |

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| Subsection: | 615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units. |
| Revision: | Replace the subsection with the following: Tension splices in the circumferential reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be no less than 2 inches and no more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches. |
| Subsection: | 615.06.07 Laps, Welds, and Spacing for Precast Endwalls. |
| Revision: | Replace the subsection with the following: Splices in the reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. The spacing center-to-center of the wire fabric sheet shall not be less than 2 inches or more than 8 inches. |
| Subsection: | 615.08.01 Type of Test Specimen. |
| Revision: | Replace the subsection with the following: Start-up slump, air content, unit weight, and temperature tests will be performed each day on the first batch of concrete. Acceptable start-up results are required for production of the first unit. After the first unit has been established, random acceptance testing is performed daily for each 50 yd ³ (or fraction thereof). In addition to the slump, air content, unit weight, and temperature tests, a minimum of one set of cylinders shall be required each time plastic property testing is performed. |
| Subsection: | 615.08.02 Compression Testing. |
| Revision: | Delete the second sentence. |
| Subsection: | 615.08.04 Acceptability of Core Tests. |
| Revision: | Delete the entire subsection. |
| Subsection: | 615.12 Inspection. |
| Revision: | Add the following sentences to the end of the subsection: Units will arrive at jobsite with the "Kentucky Oval" stamped on the unit which is an indication of acceptable inspection at the production facility. Units shall be inspected upon arrival for any evidence of damage resulting from transport to the jobsite. |

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| Subsection: | 716.02.02 Paint. |
| Revision: | Replace sentence with the following: Conform to Section 821. |
| Subsection: | 716.03 CONSTRUCTION. |
| Revision: | Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, |
| Subsection: | 716.03.02 Lighting Standard Installation. |
| Revision: | Replace the second sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base. |
| Subsection: | 716.03.02 Lighting Standard Installation. |
| Part: | A) Conventional Installation. |
| Revision: | Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic. |
| Subsection: | 716.03.02 Lighting Standard Installation. |
| Part: | A) Conventional Installation. |
| Number: | 1) Breakaway Installation and Requirements. |
| Revision: | Replace the first sentence with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims. |
| Subsection: | 716.03.02 Lighting Standard Installation. |
| Part: | B) High Mast Installation |
| Revision: | Replace the first sentence with the following: Install each high mast pole as noted on plans. |
| Subsection: | 716.03.02 Lighting Standard Installation. |
| Part: | B) High Mast Installation |
| Number: | 2) Concrete Base Installation |
| Revision: | Modification of Chart and succeeding paragraphs within this section: |

| Drilled Shaft Depth Data | | | | | | | |
|--------------------------|-------|------------------|------------------|------------------|------|-----------------------------------|------|
| Level Ground | | 3:1 Ground Slope | | 2:1 Ground Slope | | 1.5:1 Ground Slope ⁽²⁾ | |
| Soil | Rock | Soil | Rock | Soil | Rock | Soil | Rock |
| 17 ft | 7 ft | 19 ft | 7 ft | 20 ft | 7 ft | ⁽¹⁾ | 7 ft |
| Steel Requirements | | | | | | | |
| Vertical Bars | | | | Ties or Spiral | | | |
| Size | Total | Size | Spacing or Pitch | | | | |
| #10 | 16 | #4 | 12 inch | | | | |

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| | <p>(1): Shaft length is 22' for cohesive soil only. For cohesionless soil, contact geotechnical branch for design.</p> <p>(2): Do not construct high mast drilled shafts on ground slopes steeper than 1.5:1 without the approval of the Division of Traffic.</p> <p>If rock is encountered during drilling operations and confirmed by the engineer to be of sound quality, the shaft is only required to be further advanced into the rock by the length of rock socket shown in the table. The total length of the shaft need not be longer than that of soil alone. Both longitudinal rebar length and number of ties or spiral length shall be adjusted accordingly.</p> <p>If a shorter depth is desired for the drilled shaft, the contractor shall provide, for the state's review and approval, a detailed column design with individual site specific soil and rock analysis performed and approved by a Professional Engineer licensed in the Commonwealth of Kentucky.</p> <p>Spiral reinforcement may be substituted for ties. If spiral reinforcement is used, one and one-half closed coils shall be provided at the ends of each spiral unit. Subsurface conditions consisting of very soft clay or very loose saturated sand could result in soil parameters weaker than those assumed. Engineer shall consult with the geotechnical branch if such conditions are encountered.</p> <p>The bottom of the drilled hole shall be firm and thoroughly cleaned so no loose or compressible materials are present at the time of the concrete placement. If the drilled hole contains standing water, the concrete shall be placed using a tremie to displace water. Continuous concrete flow will be required to insure full displacement of any water.</p> <p>The reinforcement and anchor bolts shall be adequately supported in the proper positions so no movement occurs during concrete placement. Welding of anchor bolts to the reinforcing cage is unacceptable, templates shall be used.</p> <p>Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction.</p> |
| <p>Subsection: Part: Revision:</p> | <p>716.03.03 Trenching. A) Trenching of Conduit for Highmast Ducted Cables. Add the following after the first sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.</p> |
| <p>Subsection: Part: Revision:</p> | <p>716.03.03 Trenching. B) Trenching of Conduit for Non-Highmast Cables. Add the following after the second sentence: If depths greater than 24 inches are necessary for either situation listed previously, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.</p> |
| <p>Subsection: Revision:</p> | <p>716.03.10 Junction Boxes. Replace subsection title with the following: Electrical Junction Box.</p> |

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| Subsection: | 716.04.07 Pole with Secondary Control Equipment. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure mounting the cabinet to the pole, backfilling, restoration, any necessary hardware to anchor pole, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breaker, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work. |
| Subsection: | 716.04.08 Lighting Control Equipment. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure constructing the concrete base, excavation, backfilling, restoration, any necessary anchors, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breakers, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work. |
| Subsection: | 716.04.09 Luminaire. |
| Revision: | Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed. |
| Subsection: | 716.04.10 Fused Connector Kits. |
| Revision: | Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed. |
| Subsection: | 716.04.13 Junction Box. |
| Revision: | Replace the subsection title with the following: Electrical Junction Box Type Various. |
| Subsection: | 716.04.13 Junction Box. |
| Part: | A) Junction Electrical. |
| Revision: | Rename A) Junction Electrical to the following: A) Electrical Junction Box. |
| Subsection: | 716.04.14 Trenching and Backfilling. |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work. |
| Subsection: | 716.04.18 Remove Lighting. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as a lump sum for the removal of lighting equipment. The Department will not measure the disposal of all equipment and materials off the project by the contractor. The Department also will not measure the transportation of the materials and will consider them incidental to this item of work. |

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| Subsection: | 716.04.20 Bore and Jack Conduit. | | | | | | | | | | | | | | | |
|--------------------|---|-----------------|-----------------|-----------------|-------|-------------------------|------|-------|--------------------------------|------|------------|--------------------------------|------|------------|--------------------------------|------|
| Revision: | Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4. | | | | | | | | | | | | | | | |
| Subsection: | 716.05 PAYMENT. | | | | | | | | | | | | | | | |
| Revision: | Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following: | | | | | | | | | | | | | | | |
| | <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Code</u></th> <th style="text-align: left;"><u>Pay Item</u></th> <th style="text-align: left;"><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>04810</td> <td>Electrical Junction Box</td> <td>Each</td> </tr> <tr> <td>04811</td> <td>Electrical Junction Box Type B</td> <td>Each</td> </tr> <tr> <td>20391NS835</td> <td>Electrical Junction Box Type A</td> <td>Each</td> </tr> <tr> <td>20391NS835</td> <td>Electrical Junction Box Type C</td> <td>Each</td> </tr> </tbody> </table> | <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> | 04810 | Electrical Junction Box | Each | 04811 | Electrical Junction Box Type B | Each | 20391NS835 | Electrical Junction Box Type A | Each | 20391NS835 | Electrical Junction Box Type C | Each |
| <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> | | | | | | | | | | | | | | |
| 04810 | Electrical Junction Box | Each | | | | | | | | | | | | | | |
| 04811 | Electrical Junction Box Type B | Each | | | | | | | | | | | | | | |
| 20391NS835 | Electrical Junction Box Type A | Each | | | | | | | | | | | | | | |
| 20391NS835 | Electrical Junction Box Type C | Each | | | | | | | | | | | | | | |
| Subsection: | 723.03 CONSTRUCTION. | | | | | | | | | | | | | | | |
| Revision: | Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, | | | | | | | | | | | | | | | |
| Subsection: | 723.02.02 Paint. | | | | | | | | | | | | | | | |
| Revision: | Replace sentence with the following: Conform to Section 821. | | | | | | | | | | | | | | | |
| Subsection: | 723.03.02 Poles and Bases Installation. | | | | | | | | | | | | | | | |
| Revision: | Replace the first sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base. | | | | | | | | | | | | | | | |
| Subsection: | 723.03.02 Poles and Bases Installation. | | | | | | | | | | | | | | | |
| Part: | A) Steel Strain and Mastarm Poles Installation | | | | | | | | | | | | | | | |
| Revision: | Replace the second paragraph with the following: For concrete base installation, see Section 716.03.02, B), 2), Paragraphs 2-7. Drilled shaft depth shall be based on the soil conditions encountered during drilling and slope condition at the site. Refer to the design chart below: | | | | | | | | | | | | | | | |
| Subsection: | 723.03.02 Poles and Bases Installation. | | | | | | | | | | | | | | | |
| Part: | B) Pedestal or Pedestal Post Installation. | | | | | | | | | | | | | | | |
| Revision: | Replace the fourth sentence of the paragraph with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims. | | | | | | | | | | | | | | | |
| Subsection: | 723.03.03 Trenching. | | | | | | | | | | | | | | | |
| Part: | A) Under Roadway. | | | | | | | | | | | | | | | |
| Revision: | Add the following after the second sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain ether required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed. | | | | | | | | | | | | | | | |

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| Subsection: | 723.03.11 Wiring Installation. |
| Revision: | Add the following sentence between the fifth and sixth sentences: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes. |
| Subsection: | 723.03.12 Loop Installation. |
| Revision: | Replace the fifth sentence with the following: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes. |
| Subsection: | 723.04.02 Junction Box. |
| Revision: | Replace subsection title with the following: Electrical Junction Box Type. |
| Subsection: | 723.04.03 Trenching and Backfilling. |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work. |
| Subsection: | 723.04.10 Signal Pedestal. |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, specified conduits, fittings, ground rod, ground wire, backfilling, restoring disturbed areas, or other necessary hardware and will consider them incidental to this item of work. |
| Subsection: | 723.04.15 Loop Saw Slot and Fill. |
| Revision: | Replace the second sentence with the following: The Department will not measure sawing, cleaning and filling induction loop saw slot, loop sealant, backer rod, and grout and will consider them incidental to this item of work. |
| Subsection: | 723.04.16 Pedestrian Detector. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished, installed and connected to pole/pedestal. The Department will not measure installing R10-3e (with arrow) sign, furnishing and installing mounting hardware for sign and will consider them incidental to this item of work. |
| Subsection: | 723.04.18 Signal Controller- Type 170. |
| Revision: | Replace the second sentence with the following: The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure furnishing and connecting the induction of loop amplifiers, pedestrian isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work. |

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| Subsection: | 723.04.20 Install Signal Controller - Type 170. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed. The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, and excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure connecting the induction loop amplifiers, pedestrian, isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work. |
| Subsection: | 723.04.22 Remove Signal Equipment. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as a lump sum removal of signal equipment. The Department will not measure the return of control equipment and signal heads to the Department of Highways as directed by the District Traffic Engineer. The Department also will not measure the transportation of materials of the disposal of all other equipment and materials off the project by the contractor and will consider them incidental to this item of work. |
| Subsection: | 723.04.28 Install Pedestrian Detector Audible. |
| Revision: | Replace the second sentence with the following: The Department will not measure installing sign R10-3e (with arrow) and will consider it incidental to this item of work. |
| Subsection: | 723.04.29 Audible Pedestrian Detector. |
| Revision: | Replace the second sentence with the following: The Department will not measure furnishing and installing the sign R10-3e (with arrow) and will consider it incidental to this item of work. |
| Subsection: | 723.04.30 Bore and Jack Conduit. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4. |
| Subsection: | 723.04.31 Install Pedestrian Detector. |
| Revision: | Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed and connected to pole/pedestal. The Department will not measure installing sign R 10-3e (with arrow) and will consider it incidental to this item of work. |
| Subsection: | 723.04.32 Install Mast Arm Pole. |
| Revision: | Replace the second sentence with the following: The Department will not measure arms, signal mounting brackets, anchor bolts, or any other necessary hardware and will consider them incidental to this item of work. |
| Subsection: | 723.04.33 Pedestal Post. |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, conduit, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work. |

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| Subsection: | 723.04.36 Traffic Signal Pole Base. | | | | | | | | | | | | | | | |
|--------------------|---|-----------------|-----------------|-----------------|-------|-------------------------|------|-------|--------------------------------|------|------------|--------------------------------|------|------------|--------------------------------|------|
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, reinforcing steel, anchor bolts, specified conduits, ground rods, ground wires, backfilling, or restoration and will consider them incidental to this item of work. | | | | | | | | | | | | | | | |
| Subsection: | 723.04.37 Install Signal Pedestal. | | | | | | | | | | | | | | | |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work. | | | | | | | | | | | | | | | |
| Subsection: | 723.04.38 Install Pedestal Post. | | | | | | | | | | | | | | | |
| Revision: | Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work. | | | | | | | | | | | | | | | |
| Subsection: | 723.05 PAYMENT. | | | | | | | | | | | | | | | |
| Revision: | Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following: | | | | | | | | | | | | | | | |
| | <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Code</u></th> <th style="text-align: left;"><u>Pay Item</u></th> <th style="text-align: left;"><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>04810</td> <td>Electrical Junction Box</td> <td>Each</td> </tr> <tr> <td>04811</td> <td>Electrical Junction Box Type B</td> <td>Each</td> </tr> <tr> <td>20391NS835</td> <td>Electrical Junction Box Type A</td> <td>Each</td> </tr> <tr> <td>20391NS835</td> <td>Electrical Junction Box Type C</td> <td>Each</td> </tr> </tbody> </table> | <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> | 04810 | Electrical Junction Box | Each | 04811 | Electrical Junction Box Type B | Each | 20391NS835 | Electrical Junction Box Type A | Each | 20391NS835 | Electrical Junction Box Type C | Each |
| <u>Code</u> | <u>Pay Item</u> | <u>Pay Unit</u> | | | | | | | | | | | | | | |
| 04810 | Electrical Junction Box | Each | | | | | | | | | | | | | | |
| 04811 | Electrical Junction Box Type B | Each | | | | | | | | | | | | | | |
| 20391NS835 | Electrical Junction Box Type A | Each | | | | | | | | | | | | | | |
| 20391NS835 | Electrical Junction Box Type C | Each | | | | | | | | | | | | | | |
| Subsection: | 813.04 Gray Iron Castings. | | | | | | | | | | | | | | | |
| Revision: | Replace the reference to "AASHTO M105" with "ASTM A48". | | | | | | | | | | | | | | | |
| Subsection: | 813.09.02 High Strength Steel Bolts, Nuts, and Washers. | | | | | | | | | | | | | | | |
| Number: | A) Bolts. | | | | | | | | | | | | | | | |
| Revision: | Delete first paragraph and "Hardness Number" Table. Replace with the following: A) Bolts. Conform to ASTM A325 (AASHTO M164) or ASTM A490 (AASHTO 253) as applicable. | | | | | | | | | | | | | | | |
| Subsection: | 814.04.02 Timber Guardrail Posts. | | | | | | | | | | | | | | | |
| Revision: | Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1". | | | | | | | | | | | | | | | |
| Subsection: | 814.04.02 Timber Guardrail Posts. | | | | | | | | | | | | | | | |
| Revision: | Replace the first sentence of the fourth paragraph with the following: Use any of the species of wood for round or square posts covered under AWPA U1. | | | | | | | | | | | | | | | |
| Subsection: | 814.04.02 Timber Guardrail Posts. | | | | | | | | | | | | | | | |
| Revision: | Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1". | | | | | | | | | | | | | | | |
| Subsection: | 814.04.02 Timber Guardrail Posts. | | | | | | | | | | | | | | | |
| Revision: | Delete the second sentence of the fourth paragraph. | | | | | | | | | | | | | | | |
| Subsection: | 816.07.02 Wood Posts and Braces. | | | | | | | | | | | | | | | |
| Revision: | First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1". | | | | | | | | | | | | | | | |

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| Subsection: | 816.07.02 Wood Posts and Braces. |
| Revision: | Delete the second sentence of the first paragraph. |
| Subsection: | 818.07 Preservative Treatment. |
| Revision: | First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A". |
| Subsection: | 834.14 LIGHTING POLES. |
| Revision: | Replace the first sentence with the following: Lighting pole design shall be in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims. |
| Subsection: | 834.14.03 High Mast Poles. |
| Revision: | <p>*Remove the second and fourth sentence from the first paragraph.</p> <p>*Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.</p> <p>*Replace paragraph six with the following: Provide a pole section that conforms to ASTM A 595 grade A with a minimum yield strength of 55 KSI or ASTM A 572 with a minimum yield strength of 55 KSI. Use tubes that are round or 16 sided with a four inch corner radius, have a constant linear taper of .144 in/ft and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Provide pole sections that are telescopically slip fit assembled in the field to facilitate inspection of interior surface welds and the protective coating. The minimum length of the telescopic slip splices shall be 1.5 times the inside diameter of the exposed end of the female section. Use longitudinal seam welds as commended in Section 5.15 of the AASHTO 2013 Specifications. The thickness of the transverse base shall not be less than 2 inches. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration groove weld with backup bar.</p> <p>The handhole cover shall be removable from the handhole frame. One the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM A 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7-guage stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the</p> <p>bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. The handhole frame width shall be 0.4 times the diameter of the bottom tube.</p> <p>Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).</p> |
| Subsection: | 834.16 ANCHOR BOLTS. |
| Revision: | Insert the following sentence at the beginning of the paragraph: The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications. |

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| Subsection: | 834.17.01 Conventional. |
| Revision: | Add the following sentence after the second sentence: Provide a waterproof sticker mounted on the bottom of the housing that is legible from the ground and indicates the wattage of the fixture by providing the fist to numbers of the wattage. |
| Subsection: | 834.21.01 Waterproof Enclosures. |
| Revision: | *Add the following sentence in the second paragraph in the thirteenth sentence: Provide a cabinet door with a louvered air vent, Filter-retaining brackets and an easy clean metal filter. *Replace sentence sixteen with the following: Use a 120-volt fixture and utilize a compact fluorescent or L.E.D. bulb (equivalent to 60 watt minimum). |
| Subsection: | 835.07 Traffic Poles. |
| Revision: | Replace the first sentence of the first paragraph with the following: Pole diameter and wall thickness shall be calculated in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims. |
| Subsection: | 835.07 Traffic Poles. |
| Revision: | *Replace the first sentence of the fourth paragraph with the following: Ensure transverse plats have a thickness ≥ 2 inches. *Add the following sentence to the end of the fourth paragraph: The bottom pole diameter shall not be less than 16.25 inches. |
| Subsection: | 835.07 Traffic Poles. |
| Revision: | Replace the second sentence of the fifth paragraph with the following: For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole. |
| Subsection: | 835.07 Traffic Poles. |
| Revision: | Replace the first and second sentence of the sixth paragraph with the following: The pole handhole shall be 25 inches by 6.5 inches. The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube but needs to be at least 12 inches. |
| Subsection: | 835.07 Traffic Poles. |
| Revision: | *Replace the first sentence of the last paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. *Replace the third sentence of the last paragraph with the following: All tables referenced in 835.07 are found in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims. |

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| Subsection: | 835.07.01 Steel Strain Poles. |
| Revision: | Replace the second sentence of the second paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky. |
| Subsection: | 835.07.01 Steel Strain Poles. |
| Revision: | Replace number 7. after the second paragraph with the following: 7. Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1. |
| Subsection: | 835.07.02 Mast Arm Poles. |
| Revision: | Replace the second sentence of the fourth paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky. |
| Subsection: | 835.07.02 Mast Arm Poles. |
| Revision: | Replace number 7) after the fourth paragraph with the following: 7) Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1. |
| Subsection: | 835.07.03 ANCHORS. |
| Revision: | Add the following to the end of the paragraph: There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153). |
| Subsection: | 835.16.05 Optical Units. |
| Revision: | Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: http://www.intertek.com . |
| Subsection: | 835.19.01 Pedestrian Detector Body. |
| Revision: | Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is a compatible with the pedestrian detector. |

APPENDIX L

SPECIAL NOTE FOR MECHANICALLY STABILIZED EARTH RETAINING WALLS HOPKINS COUNTY KENTUCKY

1.0 DESCRIPTION

1.01 General and Experience Requirements:

The work under this section consists of designing, furnishing all materials and constructing Mechanically Stabilized Earth (MSE) retaining walls in accordance with the current Standard Specifications, this Special Note, in compliance with the lines and grades, dimensions and details shown on the project plans, and as directed by the Engineer.

The Contractor shall provide the MSE wall designer with a complete set of project plans and specifications and shall ensure that the wall design is compatible with all other project features that can impact the design and construction of the wall. The following terms are used in this specification for identification of various entities for which the Contractor shall be fully responsible:

| Term | Entity |
|-----------------------|--|
| Wall Manufacturer | The entity contractually retained by the contractor to provide materials and construction services for an accepted MSE wall system as identified in Subsection 1.02. |
| Wall Designer | The entity contractually retained by the contractor to provide design of an accepted MSE wall system as identified in Subsection 1.02. The wall designer may be a representative of the wall manufacturer. |
| Department / Engineer | Refers to the Kentucky Transportation Cabinet representative and/or a designated consultant acting on behalf of KYTC. |

1.02 Accepted Systems:

The contractor shall provide an MSE Wall System that uses inextensible reinforcement and reinforced concrete panels or modular block and is one of the pre-approved systems below. Inclusion of a system on this list does not relieve the Contractor and/or wall manufacturer of the contractual responsibility to satisfy all specific requirements herein and/or elsewhere in the contract documents.

- Reinforced Earth (Reinforced Earth and Retained Earth)
- Hilfiker RSE
- Tricon Retained Soil Wall System
- ISOGRID Retaining Wall System
- Keystone Keysystem I
- Sine Wall MSE Panel System

Heights and lengths of earth retaining walls may vary from, but shall not be less than, those shown on the plans. The height and length to be used for any system shall be the minimum for that system that will effectively retain the earth behind the wall for the loading conditions and the contours, profile, or slope lines shown on the plans, or on the approved working drawings, and in accordance with all relevant internal and external stability design criteria, but not more than the pre-approved height for the particular MSE wall system selected.

1.03 MSE Wall Design Engineer:

Requirements for the Wall Designer's **MSE Wall Design Engineer** (who may be employed by the wall manufacturer or may be a consultant) are:

- Licensed Professional Engineer in the Commonwealth of Kentucky with a minimum of 5 years of geotechnical and/or structural engineering experience.
- Design and/or construction experience on at least five (5) MSE Walls and a minimum of 50,000 square feet of MSE Wall completed in the past five (5) years. Experience on a Reinforced Soil Slope may be substituted for one wall and up to 10,000 square feet.
- Design experience on at least three (3) MSE Walls and a minimum of 30,000 square feet of MSE Wall on highway infrastructure projects using the wall system that will be used on this project completed in the past five (5) years.
- Completion of at least 15 Professional Development Hours related to the design and/or construction of MSE Walls in the past five (5) years. This training may consist of attendance at a related short course, conference, seminar, workshop, or college course. Include documentation of this training with the submittal of the Design Engineer's credentials.

1.04 Wall Aesthetics:

Wall aesthetics shall be as specified in the project documents and request for proposals.

1.05 Certifications:

- (A) Certification of Design Parameters: See Subsection 2.01 herein specified.
- (B) Certification of Materials: See Subsections 3.04, 3.07, 3.09 & 3.10 herein specified.

1.5 QUALITY CONTROL:

The Department will perform construction inspection for the MSE Walls. However, the Contractor will be required to proactively implement the quality control procedures described herein. All costs associated with MSE Wall Quality Control will be incidental to the cost of the wall.

1.51 MSE Wall Quality Coordinator:

The Contractor shall designate a MSE Wall Quality Coordinator who shall:

- have a minimum of 3 years of construction field experience,
- be responsible for ensuring that the Contractor's quality control procedures are implemented including maintaining and submitting the checklists required in Section 1.57, (but may have other duties and/or responsibilities),
- have sufficient authority to carry out quality coordinator responsibilities, and
- be in the field during MSE Wall construction.

1.52 Mandatory MSE Wall Construction Training:

The MSE Wall Designer or an approved appointee will provide training related to proper MSE Wall construction for Contractor and Department personnel. This training should occur after the contractor has selected the MSE Wall system and the Department has confirmed that the MSE Wall Design Engineer and Manufacturer's Technical Field Representative meet the specified requirements. The training will be conducted in the District by the Manufacturer's Technical Field Representative or an outside consultant meeting the experience requirements of the Manufacturer's Technical Field Representative. The MSE Wall Construction Training is expected to last one full day. Department

personnel who will attend will include project inspection personnel and may include other district and central office personnel. The following contractor personnel are required to attend:

- On-Site Supervisor in charge of MSE Wall construction
- MSE Wall Quality Coordinator
- At least one office management level person representing the MSE Wall contractor
- If the MSE Wall is to be constructed by a subcontractor, at least one management level representative (field or office) of the Prime Contractor
- Manufacturer's Technical Field Representative referenced in Section 1.55 herein

At least one week before the training begins, the Contractor shall submit a list of specific persons who plan to attend.

1.53 Quality Control Plan:

The contractor shall submit a Quality Control Plan to the Engineer for review and acceptance which details measurements and documentation (including daily documentation checklists) that will be maintained by the Contractor during construction to assure consistency in meeting specification requirements. The Contractor shall coordinate the development of the Quality Control Plan with the MSE Wall System Manufacturer and the MSE Wall Design Engineer. The Quality Control Plan shall be submitted to the Engineer for acceptance at least four weeks before beginning MSE wall construction.

1.54 MSE Pre-Activity Meeting:

A pre-activity meeting will be scheduled and shall occur after the Quality Control Plan has been submitted and accepted by the Engineer and no later than two (2) weeks prior to commencement of MSE wall construction activity. As a minimum, this meeting shall be attended by representatives of the Contractor and MSE Wall Sub-Contractor (including wall construction crew chiefs and MSE Wall Quality Coordinator), MSE Wall Manufacturer's Technical Field Representative, Department District personnel as designated by the Branch Manager for Project Delivery and Preservation, Central Office Construction, and Geotechnical Branch. No wall construction activity shall be performed until the contractor's final submittals have been approved as having satisfactorily resolved all review comments and the pre-activity meeting has been held.

1.55 Manufacturer's Technical Field Representative:

The MSE Wall System Manufacturer shall provide a technical field representative to provide assistance to the MSE Wall Contractor. The requirements for the **Manufacturer's Technical Field Representative** are:

- At minimum, an associate's or bachelor's degree with a major in a technical or scientific field such as engineering, engineering or construction technology, geology, physics, mathematics, etc.
- A minimum of five (5) years of technical experience related to engineering and/or construction.
- Construction experience on at least five (5) MSE Walls and a minimum of 50,000 square feet of MSE Wall completed in the past five (5) years. Experience on a Reinforced Soil Slope may be substituted for one wall and up to 10,000 square feet.
- Construction experience on at least three (3) MSE Walls and a minimum of 30,000 square feet of MSE Wall on highway infrastructure projects using the wall system that will be used on this project completed in the past five (5) years.
- Completion of at least ten (10) Professional Development Hours related to the design and/or construction of MSE Walls in the past five (5) years. This training may consist of attendance at a

related short course, conference, seminar, workshop, or college course. Include documentation of this training with the submittal of the Technical Field Representative's credentials.

At least four weeks before beginning MSE wall construction, the Contractor shall submit documentation that the Technical Field Representative meets the above requirements.

The minimum required duties of the Manufacturer's Technical Field Representative are:

- Participate in the mandatory training referenced in Section 1.52 herein.
- Participate in the preparation of the Quality Control Plan referenced in Section 1.53 herein.
- Attend the MSE Pre-Activity Meeting referenced in Section 1.54 herein.
- Ensure that the contractor obtains all "Certificates of Analysis" required in Section 3.0 (Materials Requirements) of this Special Note.
- Review all "Certificates of Analysis" and supporting documentation and provide written documentation to the Contractor and Engineer that the reviews have been completed and that all materials meet the specified requirements.
- Review all Supervisor Checklists described in Section 1.57 herein.
- Be present at a minimum, during construction of the initial 10-foot height of the full length of wall for each wall system. Additionally the representative shall be present for the initial 10-foot height of the full length of wall for each wall system as constructed by each additional contractor, and as called upon thereafter by the Engineer, to assist the contractor and Engineer at no additional cost to the Agency.
- After each on-site visit, the Contractor is required to submit a letter to the Engineer written by the Manufacturer's Technical Field Representative documenting the observations of each visit with documentation that the MSE Wall Design Engineer has reviewed the letter.
- The manufacturer's technical field representative may recommend field changes subject to the approval of the MSE Wall Design Engineer and the Department. Any such changes shall be documented in writing within 24 hours of the approved changes. This written document shall be sealed by the MSE Wall Design Engineer prior to implementation of the changes.
- The Department reserves the right to discuss matters pertaining to this project directly with the technical field representative and to require the Contractor to call the technical field representative to the site for assistance at no additional cost to the Department if, in the opinion of the Engineer, the Contractor is not satisfactorily complying with the plans and specifications.

1.56 Certificates of Analysis:

The Contractor will be responsible for performing and/or subcontracting all testing required to produce the Certificates of Analysis required in Section 3.0 (Materials Requirements) of this Special Note and for submitting the Certificates to the Engineer as required.

1.57 Checklists:

The Contractor's MSE Wall On-Site Supervisor and MSE Wall Quality Coordinator shall complete and both sign the checklists below and submit them to the Engineer with copies to the Manufacturer's Technical Field Representative. The first three of these checklists can be found in FHWA Publication No. FHWA-NHI-10-025 "*Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II*", dated November 2009 (these tables are located in the appendix of this document).

| Checklists | |
|--|--|
| Checklist Title | Submittal Requirements |
| Checklist for Drawing Review (FHWA Table 11-2) | At least two weeks before starting MSE wall construction |
| Checklist for Specification Compliance (FHWA Table 11-3) | Weekly |
| Checklist for Construction (FHWA Table 11-5) | Weekly |
| Quality Control Documentation (Quality Control Plan) | Daily |

1.58 MSE Wall Design Engineer:

The MSE Wall Design Engineer will be required to play an active role in the construction of the MSE walls and to be available to answer any questions that may arise during construction. Specifically, the MSE Wall Design Engineer is required to:

- Assist the Contractor and Manufacturer’s Technical Field Representative with preparing the Quality Control Plan referenced in Section 1.53 herein.
- Make at least one site visit (4 hour minimum) while the Contractor is installing panels and reinforced fill material during the first 10 working days of panel and reinforced fill installation
- Review documentation of the Manufacturer’s Technical Field Representative’s site visits.

Additionally, the Design Engineer is required to attend the MSE Wall Construction Training and MSE Pre-Activity Meeting.

2.0 DESIGN SUBMITTALS (WORKING DRAWINGS AND DESIGN CALCULATIONS):

2.01 Submittals:

(A) General:

Design calculations and working drawings clearly showing conformance with the current Standard Specifications; AASHTO LRFD Bridge Design Specifications, current edition; KYTC Geotechnical Manual and project requirements shall be submitted for review. The format for the working drawings shall be in accordance with the Division of Structural Design's Guidance Manual. The first sheet shall be a title sheet.

Working drawings and design calculations shall be sealed by a licensed Professional Engineer in the Commonwealth of Kentucky. The MSE wall designer/supplier shall document on the working drawings all assumptions made in the design. The following statement shall be included near the P.E. seal on the first sheet of the working drawings: “All design assumptions are validated through notes or details on these drawings.”

The Department assumes no responsibility for errors or omissions in the working drawings. Acceptance of the final working drawings submitted by the contractor shall not relieve the contractor of any responsibility under the contract for the successful completion of the work. Construction of the wall shall not commence until the contractor receives a written Notification to Begin MSE Wall Construction from the Engineer which will be issued once the complete wall package (drawings, calculations and construction procedures) is accepted. Fabrication of any of the wall components before the written Notification to Begin MSE Wall Construction shall be at the sole risk of the Contractor.

A Certificate of Analysis for the Reinforced Fill Material (See Sections 3.05 and 3.07 herein) may be required prior to final acceptance of the MSE Wall design.

(B) Review Submittals:

All review submittals shall be submitted electronically in pdf format through the Contractor to the Project Resident Engineer. The Project Resident Engineer shall forward the plans, calculations, and working drawings to the Department. Submittals may be directly emailed to applicable reviewers with the permission of the Contractor and Resident Engineer provided that the Contractor and Resident Engineer receive email copies of the submittals. Contact the Department before beginning any work on the wall designs and construction plans.

The submittals required shall include working drawings, the Contractor's and MSE Wall supplier's construction procedures, supporting design calculations, verification of experience, and a transmittal letter. The transmittal letter shall only list the documents included in the submittal. No technical information shall be included in the transmittal letter.

Working drawings, design calculations and MSE supplier's construction procedures modified as necessary by the contractor and Wall Designer for site-specific conditions shall be submitted to the Engineer for review. The Engineer shall have 30 calendar days after receiving the six complete sets to finish a review. The revised package shall be resubmitted to the Engineer for review. The Engineer shall have 15 calendar days to complete this review. This review process shall be repeated until the entire submittal is accepted by the Engineer. Additional time required by the Department to review resubmissions shall not be cause for increasing the number of contract working days. The additional work required by the contractor to provide resubmissions shall be at no cost to the Department.

The Department reserves the right to require the contractor to verify that the Reinforced Wall Fill Material meets all applicable requirement before final acceptance of the design.

(C) Final Submittals:

All final wall tracings, with drawing number, shall be submitted on 3 mil, or thicker, 22" X 36" mylar film. The final mylar tracings of the accepted working drawings submitted to the Division of Structural Design shall be dated, sealed, and signed on Sheet 1 by the licensed Professional Engineer performing the work. Nine copies of the accepted working drawings shall be submitted.

2.02 Working Drawings:

The contractor shall submit complete working drawings and specifications for each installation of the system. Working drawings shall include the following at a minimum:

- (1) Layout of the wall including plan and elevation views;
- (2) All design parameters and assumptions including design life;
- (3) Existing ground elevations and utilities impacted by the wall, and those that should be field verified by the contractor, for each location;
- (4) Complete details of all elements and component parts required for the proper construction of the system at each location and any required accommodations for drainage systems, foundation subgrades or other facilities shown on the contract documents;
- (5) The working drawing submittal shall clearly detail any special design requirements, if applicable. These special design requirements may include, but are not limited to: structural frames to place reinforcements around obstructions such as deep foundations and storm drain crossings, drainage systems, placement sequence of drainage and unit core fill with respect to reinforced (structure)

fill behind a wall face using modular block facing units, guardrail post installation, scour protection, foundation subgrade modification, all corner details (acute, obtuse and 90 degrees), slip joints, joint details of MSE walls with other cast-in-place structures, wedges, shims and other devices such as clamps and bracing to establish and maintain vertical and horizontal wall facing alignments;

- (6) A complete listing of components and materials specifications; and
- (7) Other site-specific or project specific information required by the contract.

2.03 MSE Wall Design:

(A) General:

The working drawings shall be supplemented with all design calculations for the particular installation as required herein. Installations that deviate from the accepted design (by the Contractor's MSE Wall Design Engineer) shall be accompanied by supporting stability (internal; external; and global/overall and/or compound if required in the project documents) calculations of the proposed structure as well as supporting calculations for all special details not contained in the accepted design. The MSE wall designer/supplier shall note all deviations of the proposed wall design from the accepted design.

The proposed design shall satisfy the design parameters shown on the project plans and listed in this Special Note, and comply with the design requirements of AASHTO LRFD Bridge Design Specifications, current edition and the KYTC Geotechnical and Bridge Design Guidance Manuals. Unless otherwise specified in the contract, all structures shall be designed to conform to the requirements shown in Table 1 and other requirements specified herein.

If the designer uses software other than MSEW, a minimum of one analysis corresponding to the most critical design case for each MSE wall shall be submitted using MSEW software. Sample hand calculations containing a sketch, all external analysis for the design case, and internal analyses for a minimum of three reinforcement levels shall also be submitted for the most critical design case for each MSE wall.

Table 1 - MSE Wall Design Criteria and Parameters

| | |
|--|--|
| Design Life | 100 years |
| Friction angle of granular retained backfill (<u>where required</u>) | 36° |
| Friction angle of MSE reinforced fill material | 34° * |
| Total Unit weight of granular retained backfill | 120 pcf |
| Total Unit weight of MSE reinforced fill material | 120 pcf ** |
| Minimum reinforcement length | Greater of 8 ft. or 0.7 times design height |
| Friction angle for sliding calculation (through reinforced fill) | 34° * |
| Resistance factor for sliding | As specified in AASHTO LRFD Bridge Design Specifications |
| Wall Eccentricity | Verify as specified in AASHTO LRFD Bridge Design Specifications, current edition |
| Bearing Resistance Factor | As specified in AASHTO LRFD Bridge Design Specifications |
| Surcharge Loading (due to vehicle loading behind the walls) | As specified in AASHTO LRFD Bridge Design Specifications |
| Minimum top of leveling pad embedment | 2 ft. below final grade or as specified by the Geotechnical Report |
| <p>* For internally reinforced fill material, a minimum friction angle of 34 degrees shall be substantiated by laboratory tests discussed in Subsection 3.05(D). If the measured friction angle in laboratory tests as per Subsection 3.05(D) is greater than 34 degrees and the fill material is well-graded according to the Unified Soil Classification System (USCS), then the design friction angle may be increased up to a maximum of 38 degrees. See Table 5.</p> <p>** The Total Unit Weight of the reinforced fill material shall be substantiated by laboratory tests discussed in Subsection 3.05(F). If the Total Unit Weight (i.e. SSD Bulk Density) obtained from laboratory tests as per Subsection 3.05(F) varies by more than +/- 5.0 pcf from the design value, then the design must be adjusted accordingly or reinforced fill material falling within this range must be used. See Table 5.</p> | |
| <p>“H” is the design height of the wall and is defined as the difference in elevation from the finished grade at the top of wall and the top of leveling pad. The top of the leveling pad shall always be below the minimum embedment reference line as indicated on the plans for that location. The length of reinforcement, “L”, is measured from the backface of the wall facing unit. If applicable, the length of grid type reinforcement is measured from the backface of the wall to the last full transverse member. If applicable, the total base length for modular block facing units, B_T, as measured from the front face of the wall is the length L as defined above plus the width of the modular block unit (the horizontal dimension of the block unit measured perpendicular to the wall face).</p> | |

(B) Subsurface Drainage Systems:

Walls shall be provided with subsurface drainage measures as shown on the project plans and

specifications. As a minimum, an underdrain system shall be provided for leading subsurface and surface water away from the reinforced fill material and outside the limits of the wall. Geocomposite drains, if used for subsurface drainage, shall be in accordance with Section 845 of the current Standard Specifications.

(C) Obstructions in Reinforced Fill:

(1) General:

Where obstructions, such as deep foundations or storm drains crossings, are located in the reinforced fill material zone, cutting of reinforcements to avoid obstructions shall not be permitted. A minimum offset of one diameter but not less than three (3) feet shall be maintained between the face of any pipe crossings and the back face of retaining wall panels. A minimum clearance of three (3) feet shall be maintained between the face of any other obstruction and the back face of retaining wall panels.

(2) Horizontal Deflection of Reinforcements:

In the horizontal plane at a reinforcing level, a deviation up to fifteen (15) degrees from the normal to the face of the wall may be allowed for strip reinforcement and bolted connection. This deviation is herein referred to as the splay angle. Grid reinforcements may not be splayed, unless connection has been specifically fabricated to accommodate a splay and connection detail has been approved by the Department. If used, the splay in grid reinforcement is limited to fifteen (15) degrees. For obstructions that cannot be accommodated with splayed reinforcement, structural frames and connections shall be required, and shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications, current edition. The structural frame design shall be such that bending moments are not generated in the fill reinforcement or the connection at the wall face. The design, along with supporting calculations, shall be included in the working drawings.

(3) Vertical Deflection of Reinforcements:

Vertical deflection of the reinforcement to avoid obstructions such as utilities along the wall face shall be limited to a maximum of 15 degrees from normal to face of wall. Bends in the reinforcement shall be smooth and gradual to ensure that galvanization remains intact.

(D) Hydrostatic Pressures:

As determined by the Designer and/or as noted on the plans, for walls potentially subject to inundation, such as those located adjacent to rivers, canals, detention basins or retention basins. Effective unit weights shall be used in the calculations for internal and external stability beginning at levels just below the equivalent surface of the pressure head line. Where the wall is influenced by water fluctuations, the wall shall be designed for rapid drawdown conditions which could result in differential hydrostatic pressure.

(E) Acute Angle Corners:

Wall corners with an included angle of less than 70 degrees shall be designed for bin-type lateral pressures for the extent of the wall where the full length of the reinforcement cannot be installed without encountering a wall face. Acute angle corner structures shall not be stand-alone separate structures. Computations shall be provided that demonstrate deformation compatibility between the acute angle corner structure and the rest of the MSE wall. Full-height vertical slip joints shall be provided at the acute angle corner and after the last column of panels where full length of the reinforcements can be

placed. The soil reinforcement attached to the slip joints shall be oriented perpendicular to the slip joint panels and shall be the full design length. Special connection and compaction details shall be provided on the working drawings.

(F) Spacing of Metallic Reinforcement for Flexible Face Wall Systems:

Permanent Flexible Face Wall Systems are not allowed.

(G) Fill Reinforcement for Modular Block Wall Systems:

The reinforcement lengths and percent coverage at a given reinforcement level shall be in accordance with the plans. All reinforcement shall be positively connected to the modular block facing units that is capable of resisting 100% of the maximum tension in the reinforcements at any level within the wall. Detailed documentation for connection strength shall be submitted as noted in Subsection 3.10. The vertical spacing of the reinforcement for walls with modular block facing units shall be as follows:

1. The first (bottom) layer of reinforcement shall be no further than 16 inches above the top of the leveling pad.
2. The last (top) layer of reinforcement shall be no further than 20 inches on the average below the top of the uppermost MBW unit.
3. The maximum vertical spacing between layers of adjacent reinforcement shall not exceed 32 inches. For walls deriving any part of their connection capacity by friction the maximum vertical spacing of the reinforcement should be limited to two times the block depth (front face to back face) to assure construction and long-term stability. The top row of reinforcement should be one-half the vertical spacing.

(H) Initial Batter of Wall:

The initial batter of the wall, both during construction and upon completion, shall be within the vertical and horizontal alignment tolerances included in this Special Note. The initial batter of the wall panels at the start of construction and the means and methods necessary to achieve the batter shall be provided on the working drawings. Subject to Engineer's approval, the initial batter of the wall panels may be modified at the start of construction by the manufacturer's field representative based on the evaluation of the reinforced fill material selected by the contractor. Any such changes shall be documented in writing within 24 hours of the approved changes. This written document shall be sealed by the manufacturer's design engineer who is a licensed Professional Engineer in the Commonwealth of Kentucky. Details of the wedges or shims or other devices, such as clamps and external bracing used to achieve or maintain the wall batter, and the details for removal of temporary wedges or shims shall be as shown on the working drawings and/or accompanying construction manual. Permanent shims shall comply with the design life criteria, and shall maintain the design stress levels required for the walls.

(I) Bridge Abutment Design Considerations:

Shallow Bridge Foundations supported by MSE wall systems are not allowed. All bridge loads must be supported by deep foundations.

3.0 MATERIAL REQUIREMENTS:

The contractor shall furnish the Engineer with Certificates of Analysis documenting that all materials meet the requirements herein.

3.01 Precast Concrete Elements:

Precast concrete shall attain a minimum 28-day compressive strength of 4,000 psi unless a higher strength is specified by the wall supplier. The concrete shall be air entrained containing $5.5 \pm 1.5\%$ entrained air at the time the concrete is placed in the forms. A proposed mix design shall be submitted. Prior to casting, all embedded components shall be set in place to the dimensions and tolerances designated in the plans and specifications. Wall aesthetics shall be in accordance with project plans, special notes, and/or other applicable contract documents.

(A) Concrete Testing and Inspection:

Precast concrete elements shall be subjected to compressive strength testing and inspected for dimensional tolerances and surface conditions. Panels delivered to the site without Department approval will be rejected.

(B) Casting:

Precast concrete face panels shall be cast on a horizontal surface with the front face of the panel at the bottom of the form. Connection hardware shall be set in the rear face. The concrete in each precast concrete panel shall be placed without interruption and shall be consolidated by deploying an approved vibrator, supplemented by such hand tamping as may be necessary to force the concrete into the corner of the forms, and to eliminate the formation of stone pockets or cleavage planes. Form release agents shall be used on all form faces for all casting operations.

The contractor shall advise the Engineer of the starting date for concrete panel casting at least 14 calendar days prior to beginning the operation if the casting operation is within the State, or 21 calendar days if the casting operation is outside the State.

(C) Finish:

(1) Non-Exposed Surfaces:

Rear faces of precast concrete panels shall be a face floated surface finish and screeded to eliminate open pockets of aggregate and surface distortions in excess of $\frac{1}{4}$ inch.

(2) Exposed Surfaces:

The type of finish required on exposed surfaces shall be as shown in the plans.

(a) Exposed Aggregate Finish:

- (1) Prior to placing concrete, a set retardant shall be applied to the casting forms in accordance with the manufacturer's instructions.
- (2) After removal from the forms and after the concrete has set sufficiently to prevent its dislodging, the aggregate shall be exposed by a combination of brushing and washing with clear water. The depth of exposure shall be between $\frac{3}{8}$ inch and $\frac{1}{2}$ inch.

- (3) An acrylic resin sealer consisting of 80 percent thinner and 20 percent acrylic solids by weight shall be applied to the exposed aggregate surface at a rate of one (1) gallon per 250 square feet.

(b) Concrete Panel Finish:

Concrete panel finish shall be in accordance with the plans and specifications. A sample of the proposed finish consisting of four full-sized panels shall be fabricated for inspection by the Engineer. Fabrication of the remaining panels is not authorized until the Engineer has inspected the sample panels and approved the finish as acceptable.

(D) Tolerances:

Connection device placement shall be within ± 1 inch of the dimensions shown on the drawings. Panel squareness as determined by the difference between the two diagonals shall not exceed $\frac{1}{2}$ inch.

(E) Identification and Markings:

The date of manufacture, the production lot number, and the piece mark shall be inscribed on a non-exposed surface of each element.

(F) Handling, Storage and Shipping:

All panels shall be handled, stored, and shipped in such a manner to eliminate the dangers of chipping, discoloration, cracks, fractures, and excessive bending stresses. Panels in storage shall be supported in firm blocking to protect panel connection devices and the exposed exterior finish. Storing and shipping shall be in accordance with the manufacturer's recommendations.

(G) Compressive Strength:

Precast concrete elements shall not be shipped or placed in the wall until a compressive strength of 3,400 pounds per square inch has been attained. The facing elements shall be cast on a flat and level area and shall be fully supported until a compressive strength of 1,000 pounds per square inch has been attained.

(H) Precast Concrete Panel Joints:

(1) General:

Where the wall wraps around an inside corner, a corner block panel shall be provided with flange extensions that will allow for differential movement without exposing the panel joints. The back face of vertical and horizontal joints shall be covered with geotextile filter. Joint filler, bearing pads, and geotextile filter shall be as recommended by the wall manufacturer and shall meet the requirements shown on the approved working drawings.

If required, as indicated on the plans, flexible open-cell polyurethane foam strips shall be used for filler for vertical joints between panels, and in horizontal joints where pads are used.

All joints between panels on the back side of the wall shall be covered with a Type IV geotextile fabric meeting the requirements of Section 843 of the current Standard Specifications. The minimum width shall be one (1) foot.

(2) Bearing Pads:

All horizontal and diagonal joints between panels shall include bearing pads. Bearing pads shall meet or exceed the following material requirements:

- Preformed EPDM (Ethylene Propylene Diene Monomer) rubber pads conforming to ASTM D 2000 Grade 2, Type A, Class A with a Durometer Hardness of 70.
- Preformed HDPE (High Density Polyethylene) pads with a minimum density of 0.946 grams per cubic centimeter in accordance with ASTM D 1505.

The stiffness (axial and lateral), size, and number of bearing pads shall be determined such that the final joint opening shall be $\frac{3}{4} \pm \frac{1}{8}$ inch unless otherwise shown on the plans. The MSE wall designer shall submit substantiating calculations verifying the stiffness (axial and lateral), size, and number of bearing pads assuming, as a minimum, a vertical loading at a given joint equal to 2 times the weight of facing panels directly above that level. As part of the substantiating calculations, the MSE wall designer shall submit results of certified laboratory tests in the form of vertical load-vertical strain and vertical load-lateral strain curves for the specific bearing pads proposed by the MSE wall designer. The vertical load-vertical strain curve should extend beyond the first yield point of the proposed bearing pad.

3.02 Steel Components:

(A) Galvanization:

Fill reinforcement steel shall be hot-dip galvanized in accordance with AASHTO M 111 (ASTM A123). Connection hardware steel can be galvanized by hot-dipping or other means, provided the method satisfies the requirements of AASHTO M 111 (ASTM A123). A minimum galvanization coating of 2.0 oz/ft² (605 g/m²) or 3.4 mils (85 μm) thickness is required. Fill reinforcement steel shall be adequately supported while lifting and placing such that the galvanization remains intact. Steel members with damaged (peeled) galvanization shall be repaired according to ASTM A780 and as specified in approved working drawings, at no additional cost to the Department.

(B) Metallic Reinforcing Strips and Tie Strips:

Reinforcing strips shall be hot-rolled from bars to the required shape and dimensions. The strips' physical and mechanical properties shall conform to the requirements of ASTM A572, Grade 65 minimum.

Tie strips shall be shop fabricated of hot-rolled steel conforming to the requirements of ASTM A1101, Grade 50 minimum. The minimum bending radius of the tie strips shall be $\frac{3}{8}$ inch. Galvanization shall be applied after the strips are fabricated, inclusive of punch holes for bolts as shown on approved drawings.

(C) Metallic Reinforcing Mesh:

Reinforcing mesh shall be shop fabricated of cold-drawn steel wire conforming to the requirements of AASHTO M 32, and shall be welded into the finished mesh fabric in accordance with AASHTO M 55. Galvanization shall be applied after the mesh is fabricated. A minimum galvanization coating of 2.0 oz/ft² (605 g/m²) or 3.4 mils (85 μm) thickness is required.

(D) Connector Pins:

Connector pins and mat bars shall be fabricated and connected to the fill reinforcement mats as shown in the approved working drawings. Connector bars shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32.

(E) Welded Wire Fabric:

All welded wire fabric shall conform to the requirements of AASHTO M 32, AASHTO M 55, and the approved working drawings. Welded wire fabric shall be galvanized in conformance with the requirements of ASTM A123.

(F) Fasteners:

Connection hardware shall conform to the requirements shown in the approved working drawings. Connection hardware shall be cast in the precast concrete panels such that all connectors are in alignment and able to transfer full and even load to the fill reinforcement. Once the reinforcement is connected to the panel, the amount of slack shall not exceed 1/8 inch between the connector and the reinforcement during field installation. (If wedges are to be used to remove slack, the size, shape, and installation procedure with illustrations shall be included on the drawings and in the construction procedures.) Fasteners shall be galvanized and conform to the requirements of AASHTO M 164 or equivalent.

3.03 Geosynthetic Reinforcement:

Geosynthetic fill reinforcement is not allowed.

3.04 Certificate of Analysis for Fill Reinforcements:

For metallic wall reinforcement, a mill test report containing the ultimate tensile strength for the fill reinforcement shall be included in the certification. For metallic wall reinforcement, a mill test report containing the galvanization coverage shall be included in the certification. For metallic mesh wall reinforcement, a mill test report containing the ultimate weld strength for the fill reinforcement shall be included in the certification.

3.05 Reinforced Wall Fill Material:

Provide internally reinforced wall fill material consisting of quarry-processed limestone from a Department-approved quarry meeting all applicable general requirements of Section 805 of the Standard Specifications, current edition, and requirements herein. Provide material meeting the specific requirements for “Reinforced Fill Material” in Section 805 of the Standard Specifications, current edition, defined as “Non-Erodible” according to Section 805, and meeting all other requirements herein. Approval of the material source by the Department is required prior to beginning MSE wall construction.

(A) General:

Reinforced wall fill material shall be free of shale, organic matter, mica, gypsum, smectite, montmorillonite, or other soft poor durability particles. No salvaged material, such as asphaltic concrete millings or Portland Cement Concrete rubble, etc., will be allowed.

(B) Soundness and Shale:

The reinforced fill material shall have a soundness loss of 30 percent or less when tested in accordance with AASHTO T104 using a magnesium sulfate solution with a test duration of four cycles. Alternatively, the material shall have a soundness loss of 15 percent or less when tested in accordance with AASHTO T104 using a sodium sulfate solution with a test duration of five cycles. A maximum of 2.0% shale is permitted as determined by KM 64-604.

(C) Gradation:

Gradations will be determined per AASTHO T27 and shall be in accordance with Table 2, unless otherwise specified.

| Table 2 REINFORCED FILL GRADATION REQUIREMENTS | |
|---|------------------------|
| Sieve Size | Percent Passing |
| 4 inch | 100 |
| 2 inch | 40 – 90 |
| No. 4 | 0 - 10 |
| No. 200 | 0 – 5 |
| This is the same gradation as required in Section 805.11 of the Standard Specifications except the requirement for the 2 inch sieve has been added. | |
| Size # 23 in the Standard Specifications falls within these gradation limits. | |

(D) Internal Friction Angle Requirement:

The reinforced wall fill material shall exhibit an effective (drained) angle of internal friction of not less than 34 degrees, as determined by performing a Direct Shear Test in accordance with AASHTO T236 or ASTM D3080 A minimum of three (3) points (i.e. three normal stresses) is required to constitute a complete test.

The direct shear test shall be performed on the portion finer than the 1-inch sieve. In order to comply with the test method, a minimum 12-inch diameter circular box or minimum 12-inch square box is required. The sample shall be compacted directly in the shear device at the saturated surface dry (SSD) condition and in general accordance with the rodding procedure in AASHTO T-19.

(E) Electrochemical Requirements:

The reinforced wall fill material shall meet the electrochemical requirements of Table 3.

| Table 3 ELECTROCHEMICAL REQUIREMENTS FOR METALLIC REINFORCEMENTS | | |
|--|--------------------|--------------------|
| Characteristic | Requirement | Test Method |
| Resistivity | > 3,000 ohm-cm | AASHTO T-288 |
| pH | 5.0 to 10.0 | AASHTO T-289 |
| Chlorides | < 200 ppm | ASTM D4327 |
| Sulfates | < 1000 ppm | ASTM D4327 |
| Organic Content | < 1.0 % | AASHTO T-267 |
| * If the resistivity is greater or equal to 5,000 ohm-cm, the chloride and sulfate requirements may be waived. | | |

Table 4 – VACANT

(F) Saturated Surface Dry (SSD) Bulk Density:

The Bulk Density of the Reinforced Fill Material shall be obtained in accordance with AASHTO T19. The Bulk Density at the oven-dry condition shall then be corrected using the Absorption determined

according to AASHTO T-85 to determine the SSD Bulk Density, which shall be within +/- 5.0 pcf of the design total unit weight of MSE reinforced fill material or the design shall be adjusted. (See Table 1.)

(G) Limits of Reinforced Wall Fill Material:

The reinforced fill material shall extend to at least one (1) foot beyond the free end of the reinforcement. If applicable, back-to-back walls wherein the free ends of the reinforcement of the two walls are spaced apart less than or equal to one-half the design height of the taller wall, reinforced wall fill material shall be used for the space between the free ends of the reinforcements as well. The design height of the wall is defined as the difference in elevation between finished grade at top of wall and the top of leveling pad. The top of the leveling pad shall always be below the minimum embedment reference line as indicated on the plans for the location under consideration.

3.06 Granular Embankment for Foundation and Retained Backfill:

Provide granular foundation material and granular external retained backfill consisting of “Granular Embankment” meeting the material requirements of Section 805 in the current edition of the Standard Specifications and defined as “Non-Erodible” according to Section 805. If required by design, the extent of the granular foundation material and granular external retained backfill shall be shown in the Geotechnical Notes. Contrary to the Standard Specifications, no natural sand is permitted. Also contrary to the Standard Specifications, the maximum size limit for “Granular Embankment” is 4 inches where shown in the Geotechnical Sheets. Approval of the material source by the Department is required prior to beginning placement of this material.

3.07 Sampling & Testing of Reinforced Wall Fill and Granular Embankment Materials

(A) Reinforced Wall Fill:

To obtain source approval, the contractor shall furnish the Engineer with an 80-pound representative sample of the reinforced wall fill material and a Certificate of Analysis containing results of all tests referenced in Table 5 at least four weeks prior to beginning construction of the MSE wall.

During construction, the reinforced fill material shall be sampled and tested by the Engineer for acceptance and quality control testing. A new sample and Certificate of Analysis shall be provided any time the material and/or source changes.

Table 5 - Sampling Frequency for Reinforced Wall Fill Material

| Function | Tests | Frequency |
|--|---|--|
| Source Approval | Soundness (AASHTO T104)* % Shale (KM 64-604)* Gradation (AASHTO T27)* | At least four (4) weeks prior to beginning MSE wall construction and once per material change and/or change in source. |
| Testing by Contractor and/or its Consultant(s) | Direct Shear (AASHTO T236 or ASTM D3080)* Organic Content (AASHTO T267)* SSD Bulk Density (AASHTO T19 & T85)* Resistivity (AASHTO T288)** pH (AASHTO T289)** Chlorides and Sulfates (ASTM D4327)** | Except for Direct Shear, one test is valid for up to 10,000 ft ² of MSE wall area if there is no material change or change in source. **** Generally, only one Direct Shear test is required unless there is a change in material, source, or gradation. |
| Acceptance and Quality Control | Gradation (AASHTO T27) % Shale (KM 64-304) At the discretion of the Engineer. | One per 2,000 cubic yards at job site. (A change of more than +/- 5.0 percent passing any sieve size <u>will</u> require additional SSD Bulk Density testing and <u>may</u> require additional Direct Shear testing, both by the Contractor.) |
| Testing by Department | Any other applicable requirements of Section 805 of the current Standard Specifications | As required by the current Materials Field Sampling and Testing Manual, Standard Specifications, and/or other Department policy. |

* The laboratory performing these tests must be accredited by the AASHTO Materials Reference Laboratory (AMRL) for the tests they perform. AMRL accreditation for AASHTO T104 & T27 is required to perform KM 64-604.

** Although accreditation for the specific test methods may not be available, the laboratory performing these tests must be accredited or certified by one of the organizations below. A laboratory’s accreditation or certification status does not relieve the laboratory of its responsibility to perform the tests in accordance with the specified methods.

- AMRL - Soil and/or Aggregate (Resistivity and pH only)
- American Association for Laboratory Accreditation (A2LA) - Chemical and/or Environmental
- Kentucky Division of Water - Drinking Water Chemical Analyses

The Contractor may consult the Geotechnical Branch to ensure that a lab is accredited or certified.

**** e.g. 1 to 10,000 ft² of wall requires 1 test, 10,001 to 20,000 ft² requires 2 tests, etc.

(B) Granular Embankment Material for Foundation and Retained Backfill:

To obtain source approval, the contractor shall furnish the Engineer with an 80-pound representative sample of the Granular Embankment material and a Certificate of Analysis at least four weeks prior to beginning Granular Embankment construction.

| Table 6 Sampling Frequency for Granular Embankment for Foundation and Retained Backfill | |
|--|---|
| Function | Frequency |
| Source Approval | At least four weeks prior to beginning granular embankment construction and once per material change and/or change in source. |
| Acceptance and Quality Control | In accordance with standard procedures for “Granular Embankment”. |

3.08 Cast-in-Place Concrete:

Cast-in-place concrete shall be Class A, except that the leveling pads shall be Class B, both in accordance with the current Standard Specifications.

3.09 Modular Block (Segmental) Facing Units:

This section covers dry-cast hollow and solid concrete masonry structural retaining wall units, machine made from Portland cement, water, and suitable mineral aggregates. The units are intended for use as facing units in the construction of mortarless, modular block walls (MBW) also known as segmental retaining walls (SRW). Metallic reinforcement specified in Section 3.02 shall be used as reinforcement in the reinforced (structure) wall fill zone.

(A) Casting:

Cementitious material in the modular block facing unit shall be Portland cement conforming to the requirements of ASTM C 150. If fly ash is used it shall not exceed 20% by weight of the total cement content and shall conform to ASTM C 618. Aggregates used in concrete blocks shall conform to ASTM C 33 for normal weight concrete aggregate. Efflorescence control agent shall be used in concrete mix design to prevent efflorescence on the block.

The contractor shall advise the Engineer of the starting date for concrete panel casting at least 14 calendar days prior to beginning the operation if the casting operation is within the State, or 21 calendar days if the casting operation is outside the State.

(B) Physical Requirements:

At the time of delivery to the work site, the modular block facing units shall conform to the following physical requirements:

- 1) Minimum required compressive strength of 4,000 psi (average 3 coupons)
- 2) Minimum required compressive strength of 3,500 psi (individual coupon)
- 3) Minimum oven dry unit weight of 125 pcf
- 4) Maximum water absorption of 5 % after 24 hours
- 5) Maximum number of blocks per lot of 2,000. Tests on blocks shall be submitted at the frequency of one set per lot.

Acceptance of the concrete block, with respect to compressive strength, water absorption and unit weight, will be determined on a lot basis. The lot shall be randomly sampled and tested in accordance with ASTM C140. As no additional expense to the Department, the manufacturer shall perform the tests at a Department approved laboratory and submit the results to the Engineer for approval. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupon provisions of ASTM C 140. Block lots represented by test coupons that do not reach an average compressive strength of 4,000 psi will be rejected.

(C) Freeze-Thaw Durability:

In areas where repeated freezing and thawing under saturated conditions occur, the units shall be tested to demonstrate freeze-thaw durability in accordance with Test Method ASTM C1262. Freeze thaw durability shall be based on tests from five specimens made with the same materials, concrete mix design, manufacturing process, and curing method, conducted not more than 18 months prior to delivery. Specimens used for absorption testing shall not subsequently be used for freeze-thaw testing. Specimens shall comply with either or both of the following acceptance criteria depending on the

severity of the project location as determined by the Department:

- 1) The weight loss of four out of five specimens at the conclusion of 150 cycles shall not exceed 1% of its initial weight when tested in water.
- 2) The weight loss of each of four out of the five test specimens at the conclusion of 50 cycles shall not exceed 1.5% of its initial mass when tested in a saline (3% sodium chloride by weight) solution.

(D) Tolerances for Modular Block Dimensions:

Modular blocks shall be manufactured within the following tolerances:

- 1) The length and width of each individual block shall be within $\pm 1/8$ inch of the specified dimension. Hollow units shall have a minimum wall thickness of $1/4$ inches.
- 2) The height of each individual block shall be within $\pm 1/16$ inch of the specified dimension.
- 3) When a broken (split) face finish is required, the dimension of the front face shall be within ± 1.0 inch of the theoretical dimension of the unit.

(E) Finish and Appearance:

Units that indicate imperfect molding, honeycomb or open texture concrete and color variation on front face of block due to excess form oil or other reasons shall be rejected. All units shall be visually efflorescence free. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction. Minor cracks (e.g. no greater than $1/50$ inch in width and no longer than 25% of the unit height) incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery, are not grounds for rejection.

The exposed faces shall be free of chips, cracks or other imperfections when viewed from a distance of 30 feet under diffused lighting. Up to five (5) percent of a shipment may contain slight cracks or small chips not larger than 1.0 inch.

Color and finish shall be as shown on the plans and shall be erected with a running bond configuration.

(F) Pins:

If pins are required to align modular block facing units, they shall consist of a non-degrading polymer or hot-dipped galvanized steel and be made for the express use with the modular block units supplied. Connecting pins supporting the reinforcement shall be hot-dipped galvanized steel and be capable of holding the reinforcement in the proper design position during backfilling.

(G) Cap Units and Adhesive:

The cap unit connection to the block unit immediately under it shall be of a positive interlocking type and not frictional. Cap units shall be cast to or attached to the top of modular block facing units in strict accordance with the requirements of the manufacturer of the blocks and the adhesive. The surface of the block units under the cap units shall be clear of all debris and standing water before the approved adhesive is placed. Contractor shall provide a written 10-year warranty, acceptable to Owner, that the integrity of the materials used to attach the cap blocks will preclude separation and displacement of the cap blocks for the warranty period.

(H) Unit (Core) Fill:

Unit (core) fill is defined as free-draining, coarse grained material that is placed within the empty cores

of the modular block facing units. Unit (core) fill shall be a well graded crushed stone or granular fill meeting the gradation shown in Table 7. Gradation for unit fill shall be tested at the frequency of 1 test per 50 yd³ at the job site and for every change in the material source.

Table 7
Gradation for Unit (Core) Fill

| U.S. Sieve Size | Percent Passing |
|-----------------|-----------------|
| 1½-inch | 100 |
| 1-inch | 75-100 |
| ¾-inch | 50-75 |
| No. 4 | 0-60 |
| No. 40 | 0-50 |
| No. 200 | 0-5 |

3.10 Certificate of Analysis for Modular Block Connection:

For modular block facing units, a certification shall be provided with detailed calculations according to AASHTO and the results of laboratory test results performed in accordance with Section C.3 in Appendix B of FHWA NHI-10-025, dated 2009 (“Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II”). Such certification shall demonstrate that all connections, including block-to-reinforcement and block-to-block connections, and all related components meet or exceed the current AASHTO 100 year design life requirements and are capable of resisting 100% of the maximum tension in the soil reinforcements at any level within the wall. Long-term connection testing for extensible reinforcements is also required. The effect of wall batter and normal pressures representative of the full range of wall configurations and heights shall be incorporated in the tests.

4.0 CONSTRUCTION REQUIREMENTS:

Construction of MSE walls may be subject to special requirements as specified in the Geotechnical Report and Geotechnical MSE Wall Note Sheets developed by the Design Build Team. These requirements may include but are not limited to: monitoring devices (refer to section 4.5), phased panel and reinforced fill construction, waiting period intervals and foundation modification.

4.01 Excavation:

The contractor shall ensure that temporary slopes are safe during the period of wall construction, and shall adhere to all applicable local, state and federal regulations. During construction of the MSE walls, the contractor shall design, construct, maintain and, when called for, remove temporary excavation support systems (shoring). Temporary excavation support systems may be left in place if approved by the Engineer. The back slope of the excavation shall be benched. Where shoring is required, the contractor shall submit the shoring design, and a plan outlining construction and removal procedures, to the Engineer for review and approval prior to proceeding with the work. Shoring plans shall be prepared and submitted as part of the working drawings and shall bear the seal and signature of a licensed Professional Engineer in the Commonwealth of Kentucky. All shoring design shall include appropriate input and review by a geotechnical engineer.

4.02 Foundation Preparation:

(A) General:

If required, specific ground improvement requirements shall be outlined in the Geotechnical Report and

the Geotechnical Note Sheets.

In general the following applies:

The foundation for the reinforced wall fill and retained backfill shall be graded level for the entire area of the base of such backfills, plus an additional 12 inches on all sides, or to the limits shown in the plans. If soil reinforcement components are to be positioned on native soil, the top one (1) foot of native soil shall meet the requirements of the reinforced backfill material specified in Subsection 3.05.

Foundation replacement material shall consist of "Granular Embankment" meeting the requirements of Section 3.06 herein. The material shall be compacted in accordance with Section 206 of the current Standard Specifications except that the maximum loose lift thickness (prior to compaction) is 12 inches. Type IV Geotextile Fabric shall be placed between the existing embankment material and the proposed "Granular Embankment" in accordance with Sections 214 and 843 of the Standard Specifications.

(B) Proof-Rolling:

The contractor shall perform proof-rolling to evaluate the stability and uniformity of the subgrades on which the MSE structure will be constructed. Proof rolling shall be performed on the entire areas at the following locations:

- 1) At the bottom of the overexcavation and recompaction zones.
- 2) At the bottom of the overexcavation and replacement zones.
- 3) At the base of all walls.
- 4) At the top of native soil layers and/or existing fill material that has been scarified, moisture-conditioned, and recompacted (if different from the bottom of the overexcavation and recompaction zones, or overexcavation and replacement zones).

Proof-rolling shall be done immediately after subgrade compaction while the moisture content of the subgrade soil is near optimum, or at the moisture content that was used to achieve the required compaction. Proof-rolling shall be performed again within one day prior to beginning MSE Wall construction.

If proof-rolling is performed after installation of pipe underdrains, the proof-roller shall not be used within 1½ feet of the underdrains.

Proof-rolling shall be performed with a pneumatic-tired tandem axle roller with at least three wheels on each axle, a gross weight of 25 tons (50,000 pounds), a minimum tire pressure of 75 pounds per square inch, and a minimum rolling width of 75 inches. A Caterpillar PS-300B (or PF-300B), Ingersoll-Rand PT-240R, BOMAG BW24R, Dynapac CP271, or equipment with equivalent capabilities shall be used for proof-rolling.

Proof-rolling equipment shall be operated at a speed between 1.5 and 3 miles per hour, or slower as required by the Engineer to permit measurements and/or observations of the deformations, ruts and/or pumping.

Proof-rolling shall be carried out in two directions at right angles to each other with no more than 24 inches between tire tracks of adjacent passes. The contractor shall operate the proof-roller in a pattern that readily allows for the recording of deformation data and complete coverage of the subgrade.

The following actions shall be taken based on the results of the proof-rolling activity:

- 1) Rutting (i.e. deformation that does not rebound) less than ¼-inch – The grade is acceptable.
- 2) Rutting greater than ¼-inch and less than 1½ inches – The grade shall be scarified and re-compacted.
- 3) Rutting greater than 1½ inches – The compacted area shall be removed and reconstructed.
- 4) Pumping (i.e. deformation that rebounds, or materials that are squeezed out of a wheel's path)

greater than one (1) inch – The area shall be remediated as directed by the Engineer.

The contractor shall be responsible for maintaining the condition of the approved proof-rolled soils throughout the duration of the retaining wall construction. Wall construction shall not commence until the foundation subgrade has been approved by the Engineer.

4.03 Concrete Leveling Pad:

Leveling pads shall be constructed of unreinforced Class B concrete meeting the requirements of Section 601 of the current Standard Specifications as shown on the working drawings. Gravel leveling pads shall not be allowed. The elevation of the top of leveling pad shall be within $\frac{1}{8}$ inch from the design elevation when measured by a straightedge over any 10-foot run of the leveling pad.

The minimum width of the leveling pad shall be the width of the facing unit plus 8-inches. The centerline of the leveling pad shall be within 1 inch from design location. When the facing units are centered on the leveling pad, the leveling pad shall extend approximately 4-inches beyond the limits of the facing unit as measured in the direction perpendicular to the face of the wall.

Cast-in-place leveling pads shall be cured for a minimum of 48 hours before placement of wall facing units. A geotextile shall be applied over the back of the area of any openings greater than $\frac{1}{4}$ inch between the facing units and leveling pad steps. The geotextile shall extend a minimum of six (6) inches beyond the edges of the opening. The opening shall be filled with Class B concrete, or shall be concurrently backfilled on both sides with soil.

4.04 Subsurface Drainage:

Prior to wall erection, the contractor shall install a subsurface drainage system as shown on the working drawings.

4.05 Wall Erection:

(A) General:

Walls shall be erected in accordance with the approved manufacturer's written construction procedures. The contractor shall be responsible for ensuring that a field representative from the manufacturer is available at the site during construction of the **initial 10-foot height of the full length of wall for each wall system. Additionally the representative shall be present for the initial 10-foot height of the full length of wall for each wall system as constructed by each additional contractor,** and as called upon thereafter by the Engineer, to assist the contractor and Engineer at no additional cost to the Department. All temporary construction aids (e.g., wedges, clamps, etc.) shall be in accordance with the manufacturer's recommendations.

(B) Placement Tolerances for Walls with Precast Facing:

For walls with rigid facing, such as precast concrete panels, the panels shall be placed such that their final position is vertical or battered as shown on the working drawings. As wall fill material is placed, the panels shall be maintained in the correct vertical alignment by means of temporary wedges, clamps, or bracing as recommended by the manufacturer. A minimum of two, but not more than three, rows of panel wedges shall remain in place at all times during wall erection. Wedges shall be removed from lower rows as panel erection progresses, so as to prevent chipping or cracking of concrete panels. The contractor shall repair any damage to erected concrete panels as directed by the Engineer and to the Engineer's satisfaction. No external wedges in front of the wall shall remain in place when the wall is complete.

Erection of walls with panel facing shall be in accordance with the following tolerances:

- Vertical and horizontal alignment of the wall face shall not vary by more than 3/4 inch when measured along a 10-foot straightedge.
- The overall vertical tolerance (plumbness) of the finished wall shall not exceed 1/2 inch per 10 feet of wall height. Negative (outward leaning) batter is not acceptable.
- The maximum permissible out of plane offset at any panel joint shall not exceed 3/8 inch.
- The final horizontal and vertical joint gaps between adjacent facing panel units shall be within 1/8 inch and 1/4 inch, respectively, of the design final joint opening per the approved calculations required in Subsection 3.01(H).

Wall sections not conforming to these tolerances shall be reconstructed at no additional cost to the Department.

(C) Placement Tolerances for Permanent Walls with Flexible Facing:

Permanent Flexible Facing is not allowed.

(D) Placement Tolerances for Modular Block Units:

Erection of walls with Modular Block Units shall be as per the following requirements:

- Vertical and horizontal alignment of the wall face shall not vary by more than 3/4-inch when measured along a 10-foot straightedge.
- Overall vertical tolerance (plumbness) of the wall shall not exceed 1 1/4-inch per 10-ft of wall height from the final wall batter. Negative (outward leaning) batter is not acceptable.
- The first row of units shall be level from unit-to-unit and from front-to-back. Use the tail of the units for alignment and measurement.
- All units shall be laid snugly together and parallel to the straight or curved line of the wall face.
- Unless otherwise noted, all blocks shall be dry-stacked and placed with each block evenly spanning the joint in the row below (running bond). Shimming or grinding shall control the elevations of any two adjacent blocks within 1/16 inch.
- The top of blocks shall be checked with a minimum length of 3-foot long straight edge bubble level. Any high points identified by the straight edge shall be ground flat. Block front to back tilting shall be checked frequently, however correction by shimming shall be done no later than 3 completed courses.
- Wall sections not conforming to these tolerances shall be reconstructed at no additional cost to the Department.

(E) Placement of Metallic Reinforcement Elements:

Metallic reinforcement elements shall be placed normal (perpendicular) to the face of the wall, unless otherwise shown on the approved plans. All reinforcement shall be structurally connected to the wall face.

At each level of the reinforcement, the reinforced wall fill material shall be roughly leveled and compacted before placing the next layer of reinforcement. The reinforcement shall bear uniformly on the compacted reinforced fill from the connection to the wall to the free end of the reinforcing elements. The reinforcement placement elevation shall be at the connection elevation to two (2) inches higher than the connection elevation.

Where overlapping of reinforcing may occur, such as at corners, reinforcing connections to panels shall

be adjusted to maintain at least three (3) inches of vertical separation between overlapping reinforcement.

(F) Placement of Geotextile:

All joints between precast concrete panels shall be covered with geotextile on the backside of the wall. Adhesive shall be applied to panels only. Adhesive shall not be applied to geotextile fabric or within two (2) inches of a joint. The contractor shall provide geotextile having a minimum width of 12 inches, and shall overlap fabric a minimum of four (4) inches. If applicable, the placement of the geotextile fabric for modular block walls shall be in accordance with the plans.

(G) Joint Pads and Fillers:

The contractor shall install joint pads and fillers as shown on the working drawings.

(H) Placement of Geosynthetic Reinforcement:

Geosynthetic reinforcement is not allowed.

4.06 Reinforced Wall Fill Placement:

(A) General:

Reinforced wall fill material shall be compacted using a static-weighted or vibratory roller. Sheeps-foot or grid-type rollers shall not be used for compacting material within the limits of the fill reinforcement. Compaction within three (3) feet of the wall facing shall be achieved by a lightweight mechanical tamper or roller system.

Reinforced wall fill placement shall closely follow erection of each course of facing panels. Reinforced fill material shall be placed in such a manner to avoid damage or disturbance of the wall materials, misalignment of facing panels, or damage to fill reinforcement or facing members. The contractor shall place fill material to the level of the connection and in such a manner as to ensure that no voids exist directly beneath reinforcing elements.

If applicable, the fill material for walls with modular block facing units shall not be advanced more than the height of a modular block unit until the drainage fill, core fill and all fill in all openings within the blocks at that level have been placed. The filled units shall be swept clean of all debris before installing the next level of units and/or placing the geogrid materials

The maximum compacted lift thickness shall not exceed eight (8) inches. The contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

For metallic reinforcements, the fill shall be spread by moving the machinery parallel to or away from the wall facing and in such a manner that the steel reinforcement remains normal to the face of the wall. Construction equipment shall not operate directly on the steel reinforcement. A minimum fill thickness of three (3) inches over the steel reinforcement shall be required prior to operation of vehicles. Sudden braking and sharp turning shall be avoided.

Wall materials which are damaged during reinforced fill material placement shall be removed and replaced by the contractor, at no additional cost to the Department. The contractor may submit alternative corrective procedures to the Engineer for consideration. Proposed alternative corrective procedures shall have the concurrence of the MSE wall supplier and designer, in writing, prior to

submission to the Engineer for consideration. All corrective actions shall be at no additional cost to the Department.

(B) Compaction Criteria:

Trial fill sections shall be constructed with Department personnel present to determine appropriate criteria to achieve adequate compaction. The trial fill sections shall be performed as follows:

- One trial fill section is valid for up to 10,000 ft² of MSE wall area (e.g. 1 to 10,000 ft² of wall requires 1 trial fill section, 10,001 to 20,000 ft² requires 2, etc.) and for no more than one individual MSE wall.
- The minimum dimensions of the test pad shall be 15 ft. wide by 50 ft. long.
- The lift thickness shall not exceed eight (8) inches after compaction.
- Compaction shall be determined by using a level to measure the settlement of the trial section at a number of points after each pass (e.g., a minimum of 5 points measured at the center of a 1 ft square metal plate or other method approved by the Engineer).
- A thickness of approximately 2.5 feet shall be constructed to determine the appropriate number of passes, which will maximize compaction without excessively crushing the rock at the surface.
- The number of passes to achieve at least 80 percent of the maximum settlement will be required for production work.
- Only those methods used to establish compaction compliance in the trial fill section shall be used for production work.
- A material change, change in source, a difference of more than +/- 5.0 percent passing any sieve size, and/or change in the approved equipment shall require the contractor to conduct a new trial fill section and obtain re-approval by the Engineer of the minimum number of passes and rolling pattern.
- The Department reserves the right to use other test methods to evaluate the adequacy of the compaction criteria.
- The trial fill sections are incidental to the bid price for Retaining Wall.

Within three (3) feet of the wall facing, compaction criteria shall be determined using test pad sections with Department personnel present to determine appropriate criteria to achieve adequate compaction. The test pad sections shall be performed as follows:

- The minimum dimensions of the test pad shall be 5 ft. wide by 15 ft. long.
- The lift thickness shall not exceed eight (8) inches after compaction.
- Compaction shall be determined by using a level to measure the settlement of the test pad section at a number of points after each pass (e.g., a minimum of 3 points measured at the center of a 1 ft square plate or other method approved by the Engineer).
- A thickness of approximately 2.5 feet shall be constructed to determine the minimum number of passes of a lightweight mechanical tamper or roller system.
- The number of passes to achieve at least 80 percent of the maximum settlement will be required for production work.
- Only those methods used to establish compaction compliance in the test pad section shall be used for production work.
- A material change, change in source, a difference of more than +/- 5.0 percent passing any sieve size, and/or change in the approved equipment shall require the contractor to conduct a new test pad section.
- The test pad sections are incidental to the bid price for Retaining Wall.

(C) Moisture Control:

The free moisture content of the reinforced fill material, as determined by KM 64-306, shall not exceed 2.0% during compaction.

(D) Protection of the Work:

The contractor shall not allow surface runoff from adjacent areas to enter the wall construction site at any time during construction operations. In addition, at the end of each day's operation, the contractor shall slope the last lift of fill material away from the wall facing so that runoff is directed away from the structure. If the subgrade is damaged due to water or otherwise, such that it does not meet the requirements of Subsection 4.02, then as directed by the Engineer, the contractor shall rework and repair the damaged subgrade at no additional expense to the Department. The criteria in Subsection 4.02 shall be used to judge the adequacy of the repair. Rework and repair shall extend to a depth where undamaged work is encountered.

4.07 Retained Backfill Placement:

As required by the Geotechnical Report and plan notes the retained backfill (i.e. external backfill outside of the reinforced volume) may consist of either soil or "Granular Embankment" meeting the requirements of Section 3.06 herein. The material shall be compacted in accordance with Section 206 of the current Standard Specifications except that the maximum loose lift thickness (prior to compaction) is 12 inches. Type IV Geotextile Fabric shall be placed between the existing embankment material and the proposed "Granular Embankment" in accordance with Sections 214 and 843 of the Standard Specifications.

4.5 MONITORING:

4.51 Monitoring Devices:

The Geotechnical Report may require devices to monitor vertical and horizontal displacement both during and after construction. The Contractor will be responsible for providing labor and materials and for cooperating with, and providing, any required assistance to Department personnel with implementation of monitoring activities. The cost of all labor and materials required to support the monitoring program will be incidental to the cost of the.

The approximate locations of any monitoring devices shall be shown in the Working Drawings prepared by the MSE Wall Designer.

4.52 Monitoring Schedule:

The monitoring schedule for any required monitoring device shall be as agreed upon in the Geotechnical Report for the structure.

5.0 METHOD OF MEASUREMENT:

5.01 MSE Retaining Wall:

Mechanically Stabilized Earth (MSE) retaining walls will be measured by the square foot of Retaining Wall. The vertical height will be taken as the difference in elevation measured from the top of wall to the top of the leveling pad. No field measurement will be made. The final quantity will be the contract

plan quantity increased or decreased by authorized changes.

The MSE Wall supplier's design may require additional excavation and MSE Wall materials to satisfy their design. The design MSE earth reinforcement lengths shall be equal to or greater than the length shown on the plans or as required by the AASHTO Specifications for the height of the wall plus live load surcharge. The lengths of the MSE Reinforcement shall be constant from the bottom to the top of the section. Extension of the plan limits to accommodate the wall design, configuration of pre-fabricated concrete units, or lengths of earth reinforcement for MSE Walls shall not be cause for changing the plan pay quantities. Additional quantities of excavation, MSE Reinforcement, MSE volume, excavation for foundation replacement, granular embankment, and labor necessary to satisfy the MSE Wall supplier's design shall be incidental to the Retaining Wall.

The MSE volume that extends twelve inches, minimum, beyond the ends of the reinforced volume for MSE Walls shall be incidental to the Retaining Wall.

All work associated with providing the design, details and construction for the coping, moment slab, barrier and pre-cast aesthetic panel shall be incidental to the Retaining Wall.

All materials, equipment, and labor necessary to provide and install the geotextile fabric immediately surrounding the reinforced fill volume shall be incidental to the Retaining Wall.

5.02 Embankment:

The quantity of embankment for external retained backfill behind the MSE Walls and, if required, granular foundation beneath the walls shall be measured according to Section 206 of the current Standard Specifications. The final quantities shall be based on field measurements.

5.03 Geotextile Fabric:

All materials, equipment, and labor necessary to provide and install the geotextile fabric placed between existing fill material and Granular Embankment shall be measured according to Section 214 of the current Standard Specifications. The final quantities shall be based on field measurements.

| [Appendix:](#)

APPENDIX M

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Capacity Rating 102.10 Delivery of Proposals

102.08 Irregular Proposals 102.14 Disqualification of Bidders

102.09 Proposal Guaranty

CIVIL RIGHTS ACT OF 1964

The Kentucky Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Federal Department of Transportation (49 C.F.R., Part 21), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

SECOND TIER SUBCONTRACTS

Second Tier subcontracts on federally assisted projects shall be permitted. However, in the case of DBE's, second tier subcontracts will only be permitted where the other subcontractor is also a DBE. All second tier subcontracts shall have the consent of both the Contractor and the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet (“the Cabinet”) that Disadvantaged Business Enterprises (“DBE”) shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

“The bidder certifies that it has secured participation by Disadvantaged Business Enterprises (“DBE”) in the amount of ____ percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program.”

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request*, form TC 63-35 DBE, within 10 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder’s DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

- 1 Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
- 2 Description of the work each is to perform including the work item , unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Project Code Number (PCN), Category Number, and the Project Line Number can be found in the “material listing” on the Construction Procurement website under the specific letting;
- 3 The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows; a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:
 - The entire expenditure paid to a DBE manufacturer;
 - 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to

the public, maintain an inventory and own and operate distribution equipment;
and

- The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.
- b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;
- c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
- 4 Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
- 5 Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

UPON AWARD AND BEFORE A WORK ORDER WILL BE ISSUED

Contractors must submit the signed subcontract between the contractor and the DBE contractor, the DBE's certificate of insurance, and an affidavit for bidders, offerors, and contractors from the DBE to the Division of Construction Procurement. The affidavit can be found on the Construction Procurement website. If the DBE is a supplier of materials for the project, a signed purchase order and an affidavit for bidders, offerors, and contractors must be submitted to the Division of Construction Procurement.

Changes to DBE Participation Plans must be approved by the Cabinet. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set and nine (9) copies of this information must be received in the

office of the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

- 1 Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
- 2 Whether the bidder provided solicitations through all reasonable and available means;
- 3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
- 4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the DBE Liaison in the Office of Minority Affairs to give notification of the bidder's inability to get DBE quotes;
- 5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
- 6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
- 7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;
- 8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;
- 9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;
- 10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the

work requirements of the bid proposal; and

11 Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry out the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to submit certified reports on monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal.

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

The Prime Contractor should supply the payment information at the time the DBE is compensated for their work. Form to use is located at:

<http://transportation.ky.gov/Construction/Pages/Subcontracts.aspx>

Photocopied payments and completed form to be submitted to: Office of Civil Rights and Small Business Development 6th Floor West 200 Mero Street Frankfort, KY 40622

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

09/14/11

APPENDIX N



KENTUCKY TRANSPORTATION CABINET CATEGORICAL EXCLUSION ENVIRONMENTAL DETERMINATION CHECKLIST

1. PROJECT INFORMATION

| | | | |
|--|----------------|--|---|
| SYP Project #: 2-2057 & 2-2058 | Route: WK-9001 | Work Type: Pavement Rehabilitation/ Interstate Signing | County: Marshall, Livingston, Lyons, Caldwell & Hopkins |
| Project Description: see Attachment 1 | | Purpose and Need: see Attachment 2 | |
| Roadway Conditions and Setting: see Attachment 3 | | Traffic Volume: Current-2009 - 11468 ADT Design Year (2030) 30,500 ADT | |
| Project Length: <u>37 miles (2-1057) & 55 miles (2-2058)</u> Begin MP: <u>0</u> End MP: <u>37.00</u> | | Number of alternative(s) considered including "No Build": <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 - <u>Discuss all alternatives in Section 3</u> <i>See Section 3. Alternatives Summary</i> | |
| Note: If project length is > 1 mile and on a new alignment, project may not be eligible for CE Level 1 and DEA and FHWA must be consulted. | | | |

2. ENVIRONMENTAL DETERMINATION

Categorical Exclusion- Level 3 (Attach all project correspondence and documentation)

APPROVAL SIGNATURES

NA
District Environmental Coordinator

Date

[Signature]
Project Manager

8-31-11
Date

All appropriate project commitments/mitigation and identified required future work have been entered into the CAP

[Signature]
Division of Environmental Analysis
(required for Level 2)

8/31/11
Date

[Signature]
Federal Highway Administration
(required for Level 3)

8/31/11
Date

Recommended by
[Signature]
8/31/11



KENTUCKY TRANSPORTATION CABINET CATEGORICAL EXCLUSION ENVIRONMENTAL DETERMINATION CHECKLIST

1. PROJECT INFORMATION

| | | | |
|--|----------------|--|---|
| SYP Project #: 2-2057 & 2-2058 | Route: WK-9001 | Work Type: Pavement Rehabilitation/ Interstate Signing | County: Marshall, Livingston, Lyons, Caldwell & Hopkins |
| Project Description: see Attachment 1 | | Purpose and Need: see Attachment 2 | |
| Roadway Conditions and Setting: see Attachment 3 | | Traffic Volume: Current-2009 - 11468 ADT Design Year (2030) 30,500 ADT | |
| Project Length: 37 miles (2-1057) & 55 miles (2-2058) Begin MP: 0 End MP: 37.00 Note: If project length is > 1 mile and on a new alignment, project may not be eligible for CE Level 1 and DEA and FHWA must be consulted. | | Number of alternative(s) considered including "No Build": <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 - <i>Discuss all alternatives in Section 3</i> <i>See Section 3. Alternatives Summary</i> | |

2. ENVIRONMENTAL DETERMINATION

Categorical Exclusion- Level 3 (Attach all project correspondence and documentation)

APPROVAL SIGNATURES

District Environmental Coordinator

Date

Project Manager

Date

All appropriate project commitments/mitigation and identified required future work have been entered into the CAP

Division of Environmental Analysis
(required for Level 2)

Date

Federal Highway Administration
(required for Level 3)

Date

3. ALTERNATIVES SUMMARY

Describe all alternatives that were evaluated, their impacts and the reason(s) for elimination or selection.

REQUIRED ATTACHMENTS: Location Map Plan Map/Sheet(s)

No Build Alternate (Alternative 1) – KYTC could elect not to participate any further in the development of I-69, thus, leaving a gap in the nationally designated I-69 route. While this may cause some concern, there would still be connections to the existing Purchase Parkway at the Tennessee border and the Pennyrile Parkway at the Indiana border. The existing Parkways would still serve to carry I-69 traffic through the state of Kentucky, however, without the necessary upgrades and spot improvements characteristic of an interstate facility.

Alternative 2 - Minor Upgrades and Spot Safety Improvements to the Parkway – This alternate will address key safety and operational concerns along the Western Kentucky Parkway. Design exceptions or approval of design flexibility will be sought for a number of circumstances where the Western Kentucky Parkway does not meet current AASHTO guidelines. For example, all existing substandard guardrail and guardrail end treatments will be upgraded to current standards. All existing substandard bridge rails will be upgraded to current standards. All mainline and ramp structures with brush-block curbs will be retrofitted. All overpass bridges with substandard vertical height (less than 16 feet) over the lanes will be increased to full standard (including lanes and shoulders). All ramp tapers will be improved to current interstate standards. The existing access control will be extended at exit 4 on US 62 and at exit 12 on KY 91 as necessary a distance up to the first entrances (see appendices).

A list of spot safety improvements and minor upgrades at each milepoint are listed below:

Various locations - Install signs referencing I-69

Various locations - Replace type 7 guardrail end treatments - \$3,500 each

Various locations - Replace deficient type 3 guardrail end treatments - \$1,000 each

0.000 mp - System Interchange at I-24 - seek design exception (\$7,000,000)

3.702 mp - Install jersey rails on 226-ft long bridges - \$64,000

3.702 mp - Extend tapers on all 4 ramps - \$680,000

11.021 mp - Grade to increase sight distance on vertical curve - seek design exception (\$225,000)

11.357 mp - Widen 189-ft long bridges from 30 ft width to 37.5 ft - \$567,000

11.700 mp - Extend tapers on all 4 ramps - \$672,000

11.700 mp - Increase overpass vertical clearance from 15 ft to 16 ft - \$1,120,000

13.117 mp - Add auxiliary lane to meet interchange spacing requirements - seek design exception (\$2,600,000)

13.120 mp - Increase overpass vertical clearance from 15.7 ft to 16 ft - \$850,000

16.785 mp - Grade to increase sight distance on vertical curve - seek design exception (\$100,000)

17.308 mp - Increase overpass vertical clearance from 14.6 ft to 16 ft - \$360,000

20.880 mp - Increase overpass vertical clearance from 14.9 ft to 16 ft - \$390,000

21.752 mp - Widen 207-ft long bridges from 30 ft width to 31 ft - \$84,000

22.003 mp - Widen 215-ft long bridges from 30 ft width to 31 ft - \$86,000

24.435 mp - Reconfigure toll-style interchange to diamond - seek design exception (\$10,650,000)

24.440 mp - Increase overpass vertical clearance from 15.5 ft to 16 ft - \$765,000

24.887 mp - Install jersey rails on 131 ft long bridges - \$40,000

31.580 mp - Increase overpass vertical clearance from 15.8 ft to 16 ft - \$690,000

32.528 mp - Grade to increase sight distance on vertical curve - seek design exception (\$100,000)

36.603 mp - Grade to increase sight distance on vertical curve - seek design exception (\$100,000)

37.209 mp - Grade to increase sight distance on vertical curve - seek design exception (\$100,000)

4. COMMENTS AND COORDINATION

Attach all letters, meeting minutes and copies of any newspaper advertisements.

1. Will the project have public, local government and resource agency outreach?

Identify type of outreach used:

Meeting(s) Date(s): September 23-October 1, 2002

Newspaper Adv. Newspaper Name various

Date(s): Prior to meetings

listed above

Meeting(s) with local government and affected property owners Date(s): July 16-18, 2002

2. Was there public or agency controversy on the project? If "Yes", explain in #

3. Additional work needed to resolve all public, resource agency, and property owners concerns? If "Yes" explain plans for resolution in #4 below.

4. Describe any unresolved issues: Public involvement was held early in the project planning phases of the project; very little controversy was observed by officials in attendance. There was strong public support for designating the Parkways as I-69 at the earliest possible date.

| <u>YES</u> | <u>NO</u> |
|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> |

5. ENVIRONMENTAL COMMITMENTS, MITIGATION, REQUIRED FUTURE ACTIONS AND OTHER COMMENTS

1. Does the project have environmental commitments, mitigation measures, additional environmental investigations, studies or approvals still to be completed? If "Yes", DEC should advise Project Manager for consideration of CAP entry in Oracle.

| <u>YES</u> | <u>NO</u> |
|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> |

2. Identify all issues: There are no environmental mitigation or commitments associated with implementation of the I69 signing project (2-2058) or the rehabilitation of the Western Kentucky Parkway (2-2057) to meet interstate standards. The proposed Western Kentucky/Pennyrile Parkway Interchange (Western Kentucky Parkway mp 37.20-38.73), though addressed within this action, is not currently programmed for design or construction. An Environmental Overview has been conducted to identify the potential affects of this construction and is included, by reference, in this document. Impacts will be more thoroughly identified as the design of this interchange is undertaken. This will require additional environmental investigation and will also likely require mitigation for certain impacts such as those to Waters of the United States, endangered species habitat, etc. These will be defined through detailed analysis of interchange design alternatives and NEPA analysis including a separate environmental document, or reevaluation of this document, as deemed appropriate by FHWA, prior to any Phase II design and construction activities for the interchange.

3. Other unique environmental or engineering factors that require consideration through the remaining project development (excess excavation needs, utility considerations, drainage problems, geotechnical issues, topographic constraints, mines, acidic rock, drinking water wells, etc.)
NA

Project: _____

County: _____

Route: _____

NA Y N

6. ENVIRONMENTAL CONDITIONS AND CONSEQUENCES

A. Right-of-Way Impacts

| | | |
|---|-------------------------------------|-------------------------------------|
| 1. Does the project require the acquisition of right-of-way? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Business or residential relocations required. No. of relocations: Residential <u>TBD (Interchange area only)</u> Business: <u>TBD (Interchange area only)</u> * Suitable properties available: Residential: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Describe "NO" in A.8 Business: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Describe "NO" in A.8 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Full or partial property acquisition required. Estimated acreage: Fee Simple <u>TBD (Interchange area only)</u> Permanent Easement: <u>TBD (Interchange area only)</u> * | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Will excess excavation sites be required? <input type="checkbox"/> Designated <input type="checkbox"/> Permitted/Available for Contractor <input checked="" type="checkbox"/> Unknown (must note in Sec. 5) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Property transfer from a State or Federal agency required. List agency(ies) in A. 8 below | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Last resort housing required. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Cemetery affected by project | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| * If total acreage >10 acres or total relocations are >5 -consult with DEA * If total acreage is >25 acres or total relocations are >10 DEA consults with FHWA | | |
| 8. Describe Impacts/Comments: No additional ROW is required for the Interstate signing (2-1058) or the Western Kentucky Parkway rehabilitation project (2-2058). ROW requirements for the Western Kentucky/Pennyrile Parkway interchange will be determined when design of that project is initiated. Properties that could be affected are primarily rural in nature. | | |

B. Economic Impacts:

| | | |
|--|-------------------------------------|-------------------------------------|
| 1. The project will have economic impacts on the regional and/or local economy, such as effects on development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. The project will affect established businesses or business districts. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Describe Impacts/Benefits: Included in the national goals for I-69 is that the new interstate corridor will provide more job opportunities for local communities resulting in positive economic benefits to communities along the corridor. Improved travel efficiencies and designation as a NAFTA Trade Corridor will enhance economic development in the counties along I-69. Local agencies noted this potential in their comment letters and in the public meetings which were held. | | |

Project: _____

County: _____

Route: _____

NA Y N

C. Social Impacts:

- | | | |
|---|--------------------------|-------------------------------------|
| 1. The project will affect neighborhoods or community cohesion for the various social groups. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. The project will affect travel patterns and accessibility (e.g., vehicular, commuter, bicycle, or pedestrian). | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. The project will affect school districts, churches, businesses, police and fire protection, etc. Include the direct impacts and the indirect impacts that may result from the displacement of households and businesses. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. The project will affect publicly owned public park, recreation area, or wildlife or waterfowl refuge. <i>If "Yes", Section 4(f) must be completed.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Was Land and Water Conservation Fund Act funding used for any purpose at the publicly owner public park, recreation area, or wildlife or waterfowl refuge? <i>If "Yes", Section 6(f) must be completed.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. The project will impact the elderly, handicapped, nondrivers, transit-dependent, minority and ethnic groups, or the economically disadvantaged. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. The project will significantly or disproportionately impact minorities or disadvantaged persons (Environmental Justice, E.O. 12898). | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Describe Impacts/Benefits: | | |

D. Local Land Use and Transportation Plan:

- | | | | |
|---|-------------------------------------|--------------------------|-------------------------------------|
| 1. Project consistent with local land use plan. <i>(NA if no plan exists)</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Project consistent with local transportation plan. <i>(NA if no plan exists)</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Project would induce adverse or beneficial secondary and cumulative effects. | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Are there any existing and/or planned bike or pedestrian walkways | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Describe Impacts: | | | |

E. Historic Resources

- | | | |
|---|--------------------------|-------------------------------------|
| 1. Are NRHP listed eligible/potentially eligible sites/districts present within the project viewshed? <i>If "No", document means for assessing ages of structures within project viewshed or attach memorandum from DEA historian documenting no historic properties affected.</i> <i>If "Yes", indicate level of impact:</i> <input checked="" type="checkbox"/> - "No Effect" <i>(attach SHPO concurrence letter or DEA Historian memo)</i> <input type="checkbox"/> - "No Adverse Effect" <i>(attach SHPO concurrence letter)</i> <input type="checkbox"/> - "Adverse Effect" <i>(attach FHWA and SHPO concurrence letter)-Section 4(f) may need to be completed.*</i> Memorandum of Agreement is required? SHPO signature date: _____ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <i>* If Individual 4(f) required, project is not eligible for CE Level 1 or 2</i> | | |
| 2. Describe historic resource impacts: All currently programmed work will be conducted within existing r-o-w; no effect determinations are included in the appendices. SHPO letter dated June 24, 2011 for the proposed interchange indicated no historic properties would be affected by the proposed build alternative. Additional analysis will be undertaken to confirm these results, as appropriate, when design of an interchange improvement is undertaken in the future. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Project: _____

County: _____

Route: _____

NA Y N

F. Archaeological Resources:

| | | |
|--|-------------------------------------|-------------------------------------|
| 1. Does project involve the acquisition or easement of new right of way | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Are new right-of-way areas undisturbed? <i>If "No" state basis for conclusion in box F.9.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Are known archaeological resources affected by the project (per OSA database) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Is there potential for archaeological resources within the project? <i>If "Yes", to #2 or #3, consult with DEA District archaeologist for survey.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Will project impact archaeological resources. <i>If "Yes", list site number(s) that can not be avoided: 15Hk50</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Are/were sites recommended for Phase II work? (attach SHPO concurrence letter) <i>If "Yes", list site number(s): to be determined</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Are NRHP eligible/potentially eligible sites affected by the project? <i>If "Yes", indicate level of impact; If "No", attach SHPO concurrence letter:</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> - "No Adverse Effect" (attach SHPO concurrence letter) | | |
| <input type="checkbox"/> - "Adverse Effect" (attach FHWA and SHPO concurrence letter)-Section 4(f) must be completed if preservation in-place is required.* | | |
| Memorandum of Agreement required? SHPO signature date: _____ FHWA signature date: _____ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Is Native American Consultation (NAC) required? <i>If "No", explain why in F.9 below; If "Yes", document dates of consultation below and describe the outcome in F.9 below.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Dates NAC conducted: Phase I _____; Phase II _____; MOA _____ | | |
| FHWA Closure Date: Phase I _____; Phase II _____; MOA _____ | | |
| Tribal request for additional consultation: { | Phase I <input type="checkbox"/> | <input type="checkbox"/> |
| | Phase II <input type="checkbox"/> | <input type="checkbox"/> |
| | MOA <input type="checkbox"/> | <input type="checkbox"/> |
| Further Native American Consultation is required | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

9. Describe archaeological resource impacts: All pavement rehabilitation and signage work will be conducted within existing r-o-w. No effect determinations are provided in the appendices. Further survey and coordination with the SHPO and tribes will be necessary for area of the proposed interchange once design is initiated. Additional survey, and possibly mitigation, may be required for site 15Hk50 prior to the construction of the proposed interchange, if it cannot be avoided. This is not believed to be a resource worthy of preservation in place or to contain human remains.

G. SECTION 4(f)

| | | |
|--|--------------------------|-------------------------------------|
| 1. Are 4(f) properties affected by the project? <i>If "Yes", notify DEA EPM who will consult with FHWA to determine applicability of Section 4(f).</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Is the project adjacent to a 4(f) resource? <i>If "Yes", DEA EPM consult with the FHWA to determine applicability of "constructive use." If Questions 1 and 2 are both "No", go to Section H.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Prudent and feasible means to avoid 4(f) properties were fully considered but resource can not be avoided <i>Only determined in consultation with FHWA; Indicate 4(f) type below</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> Deminimis Finding <input type="checkbox"/> Programmatic Section 4(f) <input type="checkbox"/> Full Section 4(f) Statement | | |
| <i>If an Individual 4(f) Statement is required, the project can not be completed as a CE Level 1 or 2 document. However, if the impacts can be satisfied by completing a Programmatic 4(f) Statement or a Deminimis Finding, the CE can be completed as a CE Level 1 or 2 project.</i> | | |
| 4. Describe process followed, consultation completed and attach documentation developed to resolve 4(f) issue: | | |

Project: _____

County: _____

Route: _____

NA Y N

H. SECTION 6(f)

- | | | |
|--|--------------------------|-------------------------------------|
| 1. Are 6(f) properties affected by the project? <i>If "Yes", consult with DEA and FHWA to determine applicability of Section 6(f). *</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Has discussion been initiated with the Governor's Office of Local Development and the agency having responsibility for the administration of the publicly owned park, recreation area, or wildlife or waterfowl refuge. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Will a Memorandum of Agreement be required? Final Signature Date: _____ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
- * Project may only be processed as a CE Level 3 if Section 6(f) applies.

4. Describe parties involved, property involved, process followed and consultation completed to resolve 6(f) issue:
NA

I. Noise Impact (23 CFR Part 772):

- | | | |
|--|-------------------------------------|-------------------------------------|
| 1. There are noise sensitive receivers/land uses adjacent to the proposed project (e.g. residences, businesses, schools, parks, etc.). | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Indicate if any of the following are applicable, which would necessitate a noise analysis: <input type="checkbox"/> New roadway on new alignment; <input type="checkbox"/> Addition of one or more through travel lanes; <input type="checkbox"/> Significant change in vehicle mix or traffic speed; <input checked="" type="checkbox"/> Significant change in horizontal or vertical alignment; <input type="checkbox"/> A change in roadway character that substantially reduces the shielding effect of landforms or noise barriers. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Noise analysis demonstrates that noise impacts exceed the KYTC Noise Abatement Criteria Policy. <i>If "Yes", a significant impact may be associated with this project. Consultation with DEA is required.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. There are feasible and reasonable measures that can reduce impacts. <i>If "Yes", discuss in I.5 below</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

5. Describe noise impact and abatement measures (if applicable): The impacts identified are associated with the proposed interchange. A project specific noise analysis will be required prior to construction of the proposed interchange. There are no impacts associated with pavement rehabilitation or signage.

Project: _____

County: _____

Route: _____

NA Y N

J. Air Quality Impacts

| | | |
|--|-------------------------------------|-------------------------------------|
| 1. The project is located in an air quality nonattainment or maintenance area | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. The project is listed in an approved STIP and/or TIP. <i>If not in STIP, notify DEA SME</i> STIP # <u>years 2011-2014</u> Page # <u>NA</u> TIP Page # <u>NA</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Is project controversial <i>or</i> does the project HAVE or ADD a signalized intersection with a projected "open to traffic" year ADT > 80,000 vehicles per day? <i>(If "Yes" analysis may be required. Clearance memo from DEA SME is required and must be attached. If "No", check box below)</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> This project does not exceed the Kentucky CO screening criteria for project-level analysis and is not expected to produce a violation of the CO standards (35 ppm over a one-hour period or 9 ppm over an eight-hour period) | | |
| 4. Is the project type included in the Exempt Project list found at 40 CFR 93.126? <i>If "Yes", indicate project type as described in the list: _____</i> <i>If "No", contact DEA SME for assistance and attach related correspondence.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> Project is considered to be exempt or of no potential for meaningful MSAT effects. | | |
| 5. The project is in an area requiring PM 2.5 consideration (Boone, Boyd, Bullitt, Campbell, Jefferson, Kenton or part of Lawrence) Date Inter-agency Consultation completed _____; | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Project Status: <input type="checkbox"/> Exempt <input type="checkbox"/> Not Exempt, Not of Concern <input type="checkbox"/> Of Concern | | |
| <i>If PM 2.5 analysis is required, attach checklist, consultation emails, etc. to document findings.</i> | | |

Impacts/Comments: The rehabilitation and signing projects were added as modification 2010.025 and 2010.093, respectively, of the FY 2011- 2014 STIP. A STIP modification to address construction funds for the rehabilitation project will be prepared once final cost estimates are available. The interchange reconstruction project is neither in the Highway Plan or the STIP, but will be added prior to project design and development. MSAT analysis is provided in Appendix A.

K. Hazardous Materials:

- | | | |
|--|-------------------------------------|-------------------------------------|
| 1. Are known or potentially contaminated sites (service stations, landfills, automotive repair, junkyard, structures with asbestos, etc.) along the project corridor. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Is ROW required from, or extensive excavation required adjacent to a potentially contaminated site? <i>If "Yes" Phase II testing is required and should be completed prior to ROW authorization request. Deferral must be approved by FHWA.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Phase II analysis indicated the existing and/or proposed ROW is contaminated. <i>Extent and estimated remediation cost to be provided by DEA SME to Div. of ROW and Project Team.</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Will any bridges or standing structures be demolished for completion of the work? Status of inspection of bridges and structures for asbestos containing materials (ACM) <input type="checkbox"/> Complete <input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required <i>(Identify bridges and structures, discuss results of assessment, if completed, reason not required or future work in K.6 and Sec. 5)</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. If bridges are to be removed, refurbished or repainted, will there be lead-based paint wastes to address? <i>* If more than minor amounts of ACM, project may not be eligible for CE Level 1 and DEA must be consulted.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Discuss significance of any "Yes" marked in 1-5 and any deferred necessary activities (deferrals also discussed in Section 5 - Commitments): Potentially impacted areas identified include a school bus fueling station, possible junkyard and CSX railroad are located within the proposed interchange construction. Phase II analysis and Phase III remediation may be required prior to construction. However, there are no impacts associated with the pavement rehabilitation and signage project. | | |

L. Threatened and Endangered Species (T&E):

- | | | |
|---|-------------------------------------|-------------------------------------|
| 1. Sources considered to identify potential impacts to federally threatened and endangered species (attach copies): <input checked="" type="checkbox"/> USFWS Species List <input checked="" type="checkbox"/> KSNPC website <input checked="" type="checkbox"/> KDFWR web site Species Identified: <u>Indiana bat, gray bat, clubshell, fanshell, ring pink, pink mucket, sheepnose, orangefoot pimpleback, interior least tern, American burying beetle, Peregrine Falcon</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Habitat Assessment indicates Federally listed T&E <u>habitat</u> present in vicinity No Effect determined for: <u>Indiana bat</u> BA required for: <u>NA</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Indiana bat (<i>Check all that apply</i>): <input type="checkbox"/> To be Determined <input checked="" type="checkbox"/> No Effect; <input type="checkbox"/> KYTC NLTAA Finding; <input type="checkbox"/> IBCF; <input type="checkbox"/> Tree Cutting Restrictions <input type="checkbox"/> BA Complete; <input type="checkbox"/> BA to be scheduled; <input type="checkbox"/> To be Determined | | |
| 4. Project located upstream of or within Designated Critical Habitat (<i>Consultation with DEA required</i>) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Biological Assessment required: <input type="checkbox"/> Completed (attach USFWS letter) <input type="checkbox"/> To complete before Construction (<i>CAP entry recommended and include in Section 5</i>) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Project may adversely affect federally listed T&E (formal consultation required)* <i>* If the project is likely to affect a Federally listed T&E species it is not eligible for CE Level 1 or 2 and DEA and FHWA must be consulted.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Describe T&E species concerns/protective measures: DEA completed No Effect Findings (see Appendix E) for the rehabilitation and signing aspects of the project (2-2057/2058). Further coordination with the USFWS will be required prior to any construction on the proposed interchange as there is potential for impact to habitat of both the Indiana bat and the gray bat. Habitat does not appear to be present for any of the other listed species within the proposed interchange area, though this will be further considered when design is undertaken. | | |

Project: _____

County: _____

Route: _____

NA Y N

M. Water Resource Impacts:

| | | |
|--|-------------------------------------|-------------------------------------|
| <p>1. Project impacts State Listed Special Use Waters or tributaries to a Special Use Water? <i>(indicate all types below and consult DEA Permit SME prior to issuance of the CE)</i></p> <p><input type="checkbox"/> Cold Water Aquatic Habitat <input type="checkbox"/> Outstanding National Resource Water <input type="checkbox"/> Exceptional Waters <input type="checkbox"/> Reference Reach Stream <input type="checkbox"/> Outstanding State Resource Water <input type="checkbox"/> State Wild River <input type="checkbox"/> Federally Designated Wild River <input type="checkbox"/> Federally Designated Scenic River <input type="checkbox"/> Federal T&E Species</p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>2. Project will involve surface disturbance greater than one acre <i>If "Yes", note need for KPDES KYR10 storm water permit in box M.12.</i></p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>3. Project is located partially or wholly within a designated MS4 community <i>If "Yes", identify any local ordinances, restrictions, local permits or other local requirements that require consideration before, during and after construction and specify in box M.13 below and, if appropriate, Section 5.</i></p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>4. Project encroaches upon 100 year floodplain <i>If Yes, determinations regarding No Rise Certifications, FEMA Map Revisions, etc. to be made by KYTC Design, Drainage Section during final design.</i></p> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <p>5. Project could potentially impact surface or groundwater drinking water supplies (public or private)</p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>6. Project involves impacts to a stream below Ordinary High Water Mark (OHWM) <i>(If answer is "No" then the reply to questions 7 and 8 will also be "No")</i></p> <p>Estimate total number of impacts below OHWM _____</p> <p>Identify all applicable types of impact occurring below OHWM:</p> <p><input type="checkbox"/> Bridge/Pier Abutment <input type="checkbox"/> Relocation/Channelization <input type="checkbox"/> Temporary Diversion <input type="checkbox"/> Culvert <input type="checkbox"/> Low Water Crossing <input type="checkbox"/> Excess Excavation Site <input type="checkbox"/> Bank Stabilization <input type="checkbox"/> Other (describe): _____</p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>7. Project involves impacts below the OHWM to streams defined as ephemeral? Estimate length and area of the single largest ephemeral impact: _____ feet and _____ acres <i>For largest single impact: <0.1 ac = ACE LON; between 0.1 and 0.5 ac = ACE NW; > 0.5 acre = ACE IP</i></p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>8. Project involves impacts below OHWM to streams defined as intermittent or perennial? Estimate length and area of the <u>single largest</u> intermittent/perennial impact: _____ feet and _____ acres <i>Impact <300' = ACE LON; Impact between 300' & 500' = ACE NW + mitig.; Impact >500' = ACE IP + mitig Impact <0.1 ac = ACE LON; Impact between 0.1 ac & 0.5 ac = ACE NW + mitig; Impact >0.5 ac = ACE IP + mitig Impact >300' = Ind. WQC + mitig.; Cumulative impact in HUC 14 >500' = Ind. WQC + mitig.</i></p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>9. Project will impact a lake or pond requiring its draining or filling (note characteristics below)</p> <p><input type="checkbox"/> A stream enters the lake or pond <input type="checkbox"/> A stream exits the lake or pond <i>If stream is exiting lake or pond, 404 permit is required</i></p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Project: _____

County: _____

Route: _____

NA Y N

10. Project will result in loss of a Special Aquatic Site (SAS) (*indicate types below*)

- Riffle Pool Complex (#) _____
- Wetland (estimated acreage) _____

Wetland consideration/delineation:

- Project affects areas delineated as wetlands on the National Wetlands Inventory Map
- Project affects soils designated as hydric, hydric inclusive or potentially hydric on the County Soil Survey
- Project affects areas identified by field inspection as having wetland characteristics
- Wetland boundaries delineated by (*name*): _____

Project Team has evaluated all practicable alternatives and minimization measures to the proposed construction in wetlands?

Project Team has complied with the Wetlands Finding Agreement? *If "No", the project can not be approved as a CE*

If > 5.0 acres wetland impact, project may not be eligible for Level 2 (consult with FHWA)

11. Permit Requirements

401/404 Permits are likely to be required for this project (*indicate type below and in Section 5*)

If any permits are expected to be required, submit CE Request for Assistance to DEA SME

Stream/Lake/Pond Impacts: ACE LON; ACE NW; ACE IP; DOW IWQC

Mitigation required by: ACE; DOW

Wetland Impacts: ACE LON; ACE NW; ACE IP; DOW IWQC

Mitigation required by: ACE; DOW

Will this project affect navigable Waters of the U.S. as defined by USACE and require a Section 10 permit? *If "Yes", then coordination with DEA is required*

Will this project affect a navigable water body requiring a Coast Guard, Section 9 permit? *If "Yes", then coordination with Div. of Structural Design is required*

Will this project require a KPDES storm water permit (KYR10) for construction?

Will this project require any additional permits from a local MS4? (*discuss requirements in box M.13*)

Will construction in the floodplain require analysis and coordination by KYTC Design-Drainage Section to assure that potential flooding impacts are thoroughly addressed?

12. Project is within the watershed of a significant Water Resource (private or public drinking water supply, wellhead protection area, Special Use Waters, etc.)

Project is candidate for application of KYTC Karst Policy

13. Describe Water Resource Investigations Conducted, Impacts Identified and Permits Required: There are no water related impacts associated with the rehabilitation of the Western Kentucky Parkway (2-2057) or the signing of the parkway and I24 (2-2058). Impacts identified above are those that may occur as a result of construction of the interchange improvement. This will likely require USACE permits and KY Division of Water Water Quality Certifications for impacts to streams, either of which may also require mitigation for stream loss. Impacts shall be further quantified when design of the interchange is advanced. One residential groundwater user was identified in the northeastern portion of the interchange study area. Potential impacts to this user will need to be further assessed once design of the interchange is better defined.

Project: _____

County: _____

Route: _____

NA Y N

N. Construction Impacts

Discuss potential impacts of construction activities pertaining to water quality, stream diversion, air quality, detours and delays of traffic, businesses, noise, etc:

There are no special construction issues anticipated. Maintenance of traffic during construction will be made as easy and safe as possible. The project will be built under traffic. Traffic will be controlled by flagmen, one lane at a time. Fugitive dust will be controlled and minimized. Approved Best Management Practices (BMP) will be utilized to control surface runoff from the work areas.