SHAWNEE COUNTY
INVITATION TO BID

Quotation Number: 037-23 Vendor Name: _____
Date Issued: 08-07-2023 Address: _____
Closing Date: 08-28-2023, 2:00pm Phone Number: _____

1. **SHAWNEE COUNTY PROJECT:** S-121045.00: Grading, Surfacing, Bridge & Seeding – SW 107th Street over Elm Run / OSN 332.

2. **BIDS RECEIVED UNTIL**: 2:00 P.M., Local Time, Monday, August 28, 2023, through the Shawnee County bid portal, www.snco.us/purchasing/

3. **BID OPENING:** Bids from the portal will be publically read and recorded at 2:30 P.M., Local Time, Monday August 28, 2023, in the County Commission Chambers, 707 SE Quincy, 1st Floor., Topeka, Kansas

4. **DESCRIPTION OF MAJOR UNITS OF WORK:**

Removal of Existing Structures	1	LS
Clearing & Grubbing	1	LS
Mobilization	1	LS
Pavement Removal	991	SY
Unclassified Excavation	3,081	LS
Embankment	2,450	LS
15" Culvert (CSP)16 guage	30	LF
24" Culvert (RCP), Class II	108	LF
Crushed Rock Surfacing (AB-3)	1,112	Tons
Class III Excavation	1	LS
Concrete (Grade 4.0)(AE)	261.1	CY
Reinforcing Steel (Grade 60)	63,620	Lbs.
Class II Stone Riprap	459	SY
Mobilization	1	LS

(Not a complete list)

5. **DESIGN ENGINEER:** Finney & Turnipseed Transportation & Civil Engineering LLC, 610 SW 10th Street, Suite 200, Topeka, Kansas

6. **BID DOCUMENTS:** Digital (pdf) Project Drawings and Project Manual may be obtained free of charge from the bid portal, or by emailing a request to cmattox@finturn.com

7. **BID SECURITY REQUIREMENTS:** All bids must be accompanied by a certified check, cashier's check or a bid bond for not less than five percent (5%) of the amount bid (including alternates), made payable to the County Clerk of Shawnee County, Kansas.

8. **PRE-BID CONFERENCE:** A pre-bid conference will be held at N/A.

9. **SUBMITTAL:** Bid Submittal requirements are explained in the Instructions to Bidders.

DOCUMENT 330
BID FORM

TO: Board of County Commissioners
707 SE Quincy, 1st Floor
Topeka, Kansas 66603

Project No. and Description: S-121045.00 – Grading, Surfacing, Bridge & Seeding – SW 107th Street Bridge over Elm Run/ OSN 332 .

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and be complete by the Calendar Completion Dates indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for thirty (30) days after the day of Bid opening. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within ten days after receipt of the award of contract and Contract Documents from the Owner.

3. In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that:

a. Bidder has examined copies of all the bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Number
_____	_____
_____	_____
_____	_____
_____	_____

b. Bidder has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

c. Bidder has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in the Supplementary Conditions (if applicable) of the extent of the technical data contained in such reports and drawings upon which Bidder is entitled to rely.

d. Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in

addition to or to supplement these referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Bidder considers necessary for the performance or furnishing of the Work at the Contract Price, by the Calendar Completion Date and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by Bidder for such purposes.

e. Bidder has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by Bidder in order to perform and furnish the Work at the Contract Price, by the Calendar Completion Date and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

f. Bidder has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

g. Bidder has given the Design Engineer written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder.

h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over Owner.

Project No. and Description: S-121045.00: Grading, Surfacing, Bridge & Seeding – SW 107th Street over Elm Run/ OSN 332

4. Bidder will complete the Work for the following price(s):

Item	Description	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS		
2	Field Office & Laboratory (Type B)	1	Each		
3	Contractor Construction Staking	1	LS		
4	Removal of Existing Structures	1	LS		
5	Clearing & Grubbing	1	LS		
6	Remove Large Trees	26	Each		
7	Pavement Removal	991	SY		
8	Unclassified Excavation	3,081	CY		
9	Rock Excavation	115	CY		
10	Embankment	2,484	CY		
11	Supplementary Borrow Material	231	CY		
12	Class I Stone Riprap	205	SY		
13	15” Culvert (CSP), 16 gauge	30	LF		
14	24” Culvert (RCP), Class II	108	LF		
15	15” End Section (CS)	2	Each		
16	24” End Section (RC)	4	Each		
17	Object Marker (Type 3)	4	Each		
18	Crushed Rock Surfacing (AB-3)	1,086	Tons		
19	Temporary Fertilizer (15-30-15)	15	Lbs.		
20	Soil Erosion Mix	111.1	Lbs.		
21	Erosion Control (Class 1, Type C)	486	SY		
22	Biodegradable Log (20")	200	LF		
23	Filter Sock (18")	200	LF		
24	Geotextile (Erosion Control)	1,200	SY		
25	Silt Fence	200	LF		
26	Temporary Seeding and Mulching	1.01	Acre		
27	Seeding, Fertilizing and Mulching	1.01	Acre		
28	Traffic Control	1	LS		
30	Class III Excavation	236	CY		
31	Concrete Grade 4.0 (AE)	258.2	CY		
32	Reinforcing Steel (Gr. 60)	63,620	Lbs.		
33	Foundation Stabilization (Set Price)	53	CY	$40.00	$2,120.00
34	Class II Stone Riprap	459	SY		
35	Geotextile (Erosion Control)	275	SY		

TOTAL BID ..... $ _____

5. Quantities are estimated. Final payment will be based on actual quantities unless otherwise stated in the Contract Documents.

6. Bidder agrees that the Work will be substantially complete by the calendar completion date for substantial completion given in the Agreement and General Conditions.

7. Bidder accepts the provisions of the Agreement for Liquidated Damages in the event of failure to complete the work by the calendar completion date.

8. The following documents are attached to and made a condition of this Bid:

   a. Required Bid Security in the form of a certified or bank check or a bid bond in accordance with the provisions of the Instructions to Bidders.

   b. List of Subcontractors/Suppliers.

9. The terms used in this Bid which are defined in the General Conditions included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 2023

_____ a(n) _____
Name of Bidder (individual,partnership,corporation)

_____
Address of Bidder

_____
Telephone Number

By: _____ , (Corporate Seal)
Authorized Person

_____
Title

Project Number: S-121045.00
Contractor's Name: _____

List of Subcontractors/Suppliers

The Bidder is required to furnish the following information in accordance with the provisions of Section 100, Instructions to Bidders for ALL Subcontractors. Each Supplier performing more than 10 % of the Total Bid shall also be furnished. Do not list alternate subcontractors/suppliers for the same work. The Contractor shall list only one subcontractor/supplier for each such portion of Work as is defined by the Contractor in his bid. Contractor shall not substitute any person as subcontractor/supplier in the place of a subcontractor/supplier listed below, except as provided in Section 100.

The Bidder understands that if he fails to specify a subcontractor/supplier for any portion of the Work to be performed under the contract or specifies more than one subcontractor/supplier for the same portion of the Work, he shall be deemed to have agreed that he is fully qualified to perform that portion himself and that he shall not be permitted to sublet or subcontract that portion of the Work, except as provided in Section 100.

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

SHAWNEE COUNTY, KANSAS

SPECIFICATIONS AND CONTRACT

DOCUMENTS

GRADING, SURFACING, BRIDGE & SEEDING
Project No. S-121045.00
SW 107th Street Bridge over Elm Run
OSN 332

DIRECTOR OF PUBLIC WORKS/
SHAWNEE COUNTY ENGINEER

Curt F. Niehaus, P.E.

BOARD OF COUNTY
COMMISSIONERS

William D. Riphahn
Chair

Aaron Mays
Vice-Chair

Kevin J. Cook
Member

Shawnee County
Department of Public Works
1515 NW Saline Street
Topeka, Kansas

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DOCUMENT 020
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6. **BID DOCUMENTS:** Digital (pdf) Project Drawings and Project Manual may be obtained free of charge from the bid portal, or by emailing a request to cmattox@finturn.com

7. **BID SECURITY REQUIREMENTS:** All bids must be accompanied by a certified check, cashier's check or a bid bond for not less than five percent (5%) of the amount bid (including alternates), made payable to the County Clerk of Shawnee County, Kansas.

8. **PRE-BID CONFERENCE:** A pre-bid conference will be held at N/A .

9. **SUBMITTAL:** Bid Submittal requirements are explained in the Instructions to Bidders.

DOCUMENT 100
INSTRUCTIONS TO BIDDERS

1. Defined Terms.

   Terms used in these Instructions to Bidders shall have the meanings assigned to them in the General Conditions. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

2. Copies of Bidding Documents.

   2.1. Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Invitation may be obtained from the office designated in the Invitation to Bid.

   2.2. Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Design Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

   2.3. Owner and Design Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. Qualifications of Bidders.

   To demonstrate qualifications to perform the Work, the apparent low Bidder must be prepared to submit within five days of Owner's request written evidence of the types set forth in the General or Supplementary Conditions, such as financial data, previous experience and evidence of authority to conduct business in the jurisdiction where the Project is located. Any information furnished pursuant to this section shall be deemed confidential and will not be disclosed by the Owner. Each Bid must contain evidence of Bidder's qualification to do business in the State of Kansas or covenant to obtain such qualification prior to award of the contract.

4. Examination of Contract Documents and Site.

   4.1. Before submitting a Bid, each Bidder must (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the Work, (c) familiarize himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work; and (d) study and carefully correlate Bidder's observations with the Contract Documents.

   4.2. Reference is made to the Supplementary Conditions for the identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Work which have been relied upon by Engineer in preparing the Drawings and Specifications. Owner will make copies of such reports available to any Bidder requesting them. These reports are not guaranteed as to accuracy or completeness, nor are they part of the Contract Documents. Before submitting his Bid each Bidder will, at his own expense, make such additional investigations and tests as the

Bidder may deem necessary to determine his Bid for performance of the Work in accordance with the specified calendar completion dates, price and other terms and conditions of the Contract Documents.

4.3. On request Owner will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid.

4.4. The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Supplementary Conditions, Specifications or Drawings.

4.5. The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article 4 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms, and conditions for performance of the Work.

5. Interpretations.

All questions about the meaning or intent of the Contract Documents shall be submitted to the Design Engineer as defined in Article 2 of the Agreement in writing at least 10 calendar days prior to the opening of Bids. Replies will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6. Bid Security.

6.1. Bid Security shall be made payable to County Clerk of Shawnee County, in an amount of five percent of the Bidder's maximum Bid price (including alternates) and in the form of a certified, cashier's check or a Bid Bond issued by a Surety meeting the requirement of paragraph 5.1 of the General Conditions. All forms of Bid Security must be delivered in original form. Facsimile transmission of Bid Security documents will not be accepted.

6.2. The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required Contract Security, whereupon it will be returned; if the successful Bidder fails to execute and deliver the Agreement and furnish the required Contract Security within 10 days of the award of contract, Owner may annul the award and the Bid Security of that bidder will be forfeited to the Owner.

The Bid Security of any Bidder whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the seventh day after the "Effective date of the Agreement" (which term is defined in the General Conditions). Bid Security of other Bidders will be returned within seven days of the Bid opening.

7. Calendar Completion Date Contract.

The specified calendar completion dates by which the Work is to be completed is set forth in the Agreement.

8. Liquidated Damages.

   Provisions for liquidated damages are set forth in the Agreement.

9. Substitute Material and Equipment.

   The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items. Whenever it is indicated in the Drawings or allowed by Specifications that a substitute or an "or equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the "Effective date of the Agreement". The procedure for submittal of any such application by Contractor and consideration by Engineer is set forth in paragraphs 6.7.1, 6.7.2 and 6.7.3 of the General Conditions which may be supplemented in the Specifications.

10. Subcontractors, etc.

   10.1. Bidder must submit to Owner, as part of their Bid Form, a complete list of all Subcontractors and other persons and organizations (including those who will be furnishing the principal items of material and equipment) proposed to be used by the bidder to complete this project. Failure by the Bidder to provide this list with his bid shall render the bid nonresponsive. If requested by the Owner, the Successful Bidder shall submit to the owner, in writing, an experience statement with pertinent information as to similar projects and other evidence of qualifications for each such Subcontractor, person and organization listed on the Bid Form. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, other person or organization, either Owner or Engineer may before giving the award of contract, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid Price. If the apparent Successful Bidder declines to make any such substitution, the contract shall not be awarded to such Bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Security. Any Subcontractor, other person or organization so listed and to whom Owner or Engineer does not make written objection prior to giving the award of contract, will be deemed acceptable to Owner and Engineer. Substitutions to this list of acceptable Subcontractors and other persons and organizations after the apparent Successful Bidder has been awarded a contract by the Owner will not be allowed without the written approval of the Owner or Engineer.

   10.2. No Contractor shall be required to employ any Subcontractor, other person or organization against whom he has reasonable objection.

   10.3. No Subcontractor who is on the Owner's "List of Suspended Contractors" as of the date of the opening of Bids may be employed by the Contractor on the project. A current list of suspended contractors may be obtained from the County Clerk's Office.

   10.4. The amount of the Work performed by Subcontractors in aggregate shall not exceed seventy (70) percent of the Total Bid in accordance with paragraph 6.8.3 of the General Conditions. A contract will not be awarded to a bidder not in compliance with this requirement.

11. Bid Form.

11.1. The Bid Form is included in this Project Manual.

11.2. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address shall be shown below the signature.

11.3. Bids by partnerships must be executed in the partnership name and signed by a partner whose title must appear under the signature and the official address of the partnership must be shown below the signature.

11.4. All names must be typed or printed below the signature.

11.5. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

11.6. The address to which communications regarding the Bid are to be directed must be shown, if different than that required above.

12. Submission of Bids.

12.1. Bids must be submitted through the Shawnee County bid portal, www.snco.us/purchasing/ on a duly executed copy of the Bid Form. Use the Bid Form bound with the Project Manual.

12.2. Bids will not be accepted from any Contractor who is on the Owner's "List of Suspended Contractors" as of the date of the Opening of Bids. Bids received from suspended Contractors will automatically be rejected and returned unopened.

13. Modification and Withdrawal of Bids.

13.1. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

13.2. If, within twenty-four hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of his Bid, Owner may, at its sole discretion, allow that bidder to withdraw his Bid and the Bid Security will be returned.

14. Opening of Bids.

Bids received from the Shawnee County bid portal, www.snco.us/purchasing/ at the time and date indicated in the Invitation to Bid and will be publically read aloud and recorded in the County Commission Chambers, 707 SE Quincy, 1st Floor, Topeka, Kansas at the time and date indicated in the Invitation to Bid .

15. Bids to Remain Open.

All Bids shall remain open for thirty (30) days after the day of the bid opening, but Owner may, in his sole discretion, release any Bid and return the Bid Security prior to that date.

16. Award of Contract.

16.1. Owner reserves the right to reject any and all Bids, to waive any and all informalities and to negotiate contract terms with the Successful Bidder. Owner reserves the right to reject all nonconforming, nonresponsive or conditional Bids. Discrepancies in the indicated multiplication of unit prices and quantities shall be resolved in favor of the correct multiplication based on the unit prices indicated. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

16.2. In evaluating Bids, Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements and alternates and unit prices if requested in the Bid forms. It is Owner's intent to accept alternates (if any are accepted) in the order in which they are listed in the Bid form but Owner may accept them in any order or combination.

16.3. Owner may consider the qualifications, experience and financial ability of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the Work as to which the identity of Subcontractors and other persons and organizations must be submitted as provided in the General Conditions. Operating costs, maintenance considerations, performance data and guarantees of materials and equipment may also be considered by Owner.

16.4. Owner reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.

16.5. If the contract is to be awarded it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Owner.

16.6. If the contract is to be awarded, Owner will notify the Successful Bidder within thirty (30) days after the day of the Bid opening.

17. Performance and Other Bonds.

Paragraph 5.1 of the General Conditions sets forth Owner's requirements as to performance and other Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by the required Contract Security.

18. Signing of Agreement.

Owner will notify the apparent low Bidder in writing that their bid will be recommended for award of contract, it will be accompanied by at least three unsigned counterparts of the Agreement and all other Contract Documents. Contractor shall sign and deliver all counterparts of the Agreement to Owner with all other Contract Documents attached by the date and time specified in Document 820, Supplementary Conditions. The Contractor shall also submit certificates of insurance in accordance with paragraph 2.1 of the General Conditions and an estimated construction schedule in accordance with paragraph 2.6 of the General Conditions with the executed Agreement. Within ten days after contract award, Owner will deliver all fully signed counterparts to Contractor.

19. Sales Taxes.

19.1. For all projects, payment of Kansas State Sales Tax or Compensating (Use) tax is not necessary and should not be included in unit prices bid for materials to be incorporated in the work. The County Engineer will furnish an exemption certificate (including exemption certificate number) obtained from the Sales and Compensating Tax Division of the Department of Revenue of the State of Kansas to the Contractor, Subcontractor or repairmen making purchases of any tangible personal property to be incorporated in this project. The Contractor, Subcontractor or repairmen must furnish all suppliers with a copy of the properly executed exemption certificate secured for this project. He may reproduce as many copies of the certificate as he may need.

20. State Registration of Out-of-State Contractors.

Bidders are advised that K.S.A. 79-1008, 79-1009 requires the registration of out-of-state contractors with the Director of Revenue for collection of tax.

21. Non-Resident Bidders.

Attention is directed to Section 16-113 and 16-114 of the Kansas Statutes Annotated which requires that any Non-Resident Contractor who undertakes the construction of any public improvement to be paid for out of public funds, must appoint in writing and file with the Kansas Secretary of State, some person (resident in Shawnee County, Kansas) on whom service may be had in any civil action which may arise out of such contractual relation.

22. Equal Employment Opportunity.

It is the policy of Shawnee County, Kansas to require that all bidders and contractors are expected to comply with the provisions of K.S.A. 44-1030 and 44-1031 and other applicable Federal and Kansas laws governing equal employment opportunity.

22.1. Comply with K.S. A. 44-1030 requiring that:

a. The Contractor shall observe the provisions of the Kansas act against discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, physical handicap unrelated to such person's ability to engage in the particular work, national origin or ancestry;

b. In all solicitations or advertisements for employees, the Contractor shall include the phrase, "equal opportunity employer," or a similar phrase to be approved by the commission;

c. If the Contractor fails to comply with the manner in which the Contractor reports to the commission in accordance with the provisions of K.S.A. 44-1031, the Contractor shall be deemed to have breached the present contract and it may be cancelled,

terminated or suspended, in whole or in part, by the Owner;

d. If the Contractor is found guilty of a violation of the Kansas act against discrimination under a decision or order of the commission which has become final, the Contractor shall be deemed to have breached the present contract and it may be cancelled, terminated or suspended, in whole or in part, by the Owner; and

e. The Contractor shall include the provisions of paragraphs (a) through (d) inclusively of this subsection 22.1. in every sub-contract or purchase order so that such provisions will be binding upon such Subcontractor or vendor.

22.2. Guarantee that during the performance of any County contract or agreement the Contractor, Subcontractor, vendor, or supplier of the County shall comply with all provisions of the Civil Rights Act of 1964, The Equal Employment Opportunity Act of 1972, Executive Order 11246, Age Discrimination in Employment Act of 1967, Part 20 Title 41 of the Code of Federal Regulations, Rehabilitation Act of 1973.

23. Standard Technical Specifications.

This project shall be subject to the applicable sections of the City of Topeka and Shawnee County Standard Technical Specifications, 2016 Edition with any addenda thereto, except as modified or supplemented by specifications contained in this Project Manual and Kansas Department of Transportation Specifications for Road and Bridges, latest edition and addendum.

DOCUMENT 101
MODIFICATIONS TO INSTRUCTIONS TO BIDDERS

These modifications to the Instruction to Bidders amend or supplement the Instruction to Bidders, Document 100, of this Project Manual, as listed below. All provisions which are not so amended or supplemented shall remain in full force and effect.

DOCUMENT 330
BID FORM

TO: Board of County Commissioners
707 SE Quincy, 1st Floor
Topeka, Kansas 66603

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a. Bidder has examined copies of all the bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Number
_____	_____
_____	_____
_____	_____
_____	_____

b. Bidder has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

c. Bidder has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in the Supplementary Conditions (if applicable) of the extent of the technical data contained in such reports and drawings upon which Bidder is entitled to rely.

d. Bidder has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement these referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Bidder considers necessary for the performance or furnishing of the Work at the Contract Price, by the Calendar Completion Date and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by Bidder for such purposes.

e. Bidder has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by Bidder in order to perform and furnish the Work at the Contract Price, by the Calendar Completion Date and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

f. Bidder has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

g. Bidder has given the Design Engineer written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder.

h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over Owner.

Project No. and Description: S-121045.00: Grading, Surfacing, Bridge & Seeding – SW 107th Street over Elm Run/ OSN 332

4. Bidder will complete the Work for the following price(s):

Item	Description	Quantity	Unit	Unit Price	Extension
1	Mobilization	1	LS		
2	Field Office & Laboratory (Type B)	1	Each		
3	Contractor Construction Staking	1	LS		
4	Removal of Existing Structures	1	LS		
5	Clearing & Grubbing	1	LS		
6	Remove Large Trees	26	Each		
7	Pavement Removal	991	SY		
8	Unclassified Excavation	3,081	CY		
9	Rock Excavation	115	CY		
10	Embankment	2,484	CY		
11	Supplementary Borrow Material	231	CY		
12	Class I Stone Riprap	205	SY		
13	15” Culvert (CSP), 16 gauge	30	LF		
14	24” Culvert (RCP), Class II	108	LF		
15	15” End Section (CS)	2	Each		
16	24” End Section (RC)	4	Each		
17	Object Marker (Type 3)	4	Each		
18	Crushed Rock Surfacing (AB-3)	1,086	Tons		
19	Temporary Fertilizer (15-30-15)	15	Lbs.		
20	Soil Erosion Mix	111.1	Lbs.		
21	Erosion Control (Class 1, Type C)	486	SY		
22	Biodegradable Log (20")	200	LF		
23	Filter Sock (18")	200	LF		
24	Geotextile (Erosion Control)	1,200	SY		
25	Silt Fence	200	LF		
26	Temporary Seeding and Mulching	1.01	Acre		
27	Seeding, Fertilizing and Mulching	1.01	Acre		
28	Traffic Control	1	LS		
30	Class III Excavation	236	CY		
31	Concrete Grade 4.0 (AE)	258.2	CY		
32	Reinforcing Steel (Gr. 60)	63,620	Lbs.		
33	Foundation Stabilization (Set Price)	53	CY	$40.00	$2,120.00
34	Class II Stone Riprap	459	SY		
35	Geotextile (Erosion Control)	275	SY		

TOTAL BID ..... $ _____

5. Quantities are estimated. Final payment will be based on actual quantities unless otherwise stated in the Contract Documents.

6. Bidder agrees that the Work will be substantially complete by the calendar completion date for substantial completion given in the Agreement and General Conditions.

7. Bidder accepts the provisions of the Agreement for Liquidated Damages in the event of failure to complete the work by the calendar completion date.

8. The following documents are attached to and made a condition of this Bid:

   a. Required Bid Security in the form of a certified or bank check or a bid bond in accordance with the provisions of the Instructions to Bidders.

   b. List of Subcontractors/Suppliers.

9. The terms used in this Bid which are defined in the General Conditions included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 2023

_____ a(n) _____
Name of Bidder (individual,partnership,corporation)

_____
Address of Bidder

_____
Telephone Number

By: _____ , (Corporate Seal)
Authorized Person

_____
Title

Project Number: S-121045.00
Contractor's Name: _____

List of Subcontractors/Suppliers

The Bidder is required to furnish the following information in accordance with the provisions of Section 100, Instructions to Bidders for ALL Subcontractors. Each Supplier performing more than 10 % of the Total Bid shall also be furnished. Do not list alternate subcontractors/suppliers for the same work. The Contractor shall list only one subcontractor/supplier for each such portion of Work as is defined by the Contractor in his bid. Contractor shall not substitute any person as subcontractor/supplier in the place of a subcontractor/supplier listed below, except as provided in Section 100.

The Bidder understands that if he fails to specify a subcontractor/supplier for any portion of the Work to be performed under the contract or specifies more than one subcontractor/supplier for the same portion of the Work, he shall be deemed to have agreed that he is fully qualified to perform that portion himself and that he shall not be permitted to sublet or subcontract that portion of the Work, except as provided in Section 100.

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

Subcontractor: _____
Amount: _____ ($ _____)
(words)

DOCUMENT 530
AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2023 by and between Shawnee County, Kansas (hereinafter called Owner) and _____ (hereinafter called Contractor). Owner and Contractor in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. Work.

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project for which the Work under the Contract Documents is to be performed is: Project No. S-121045.00: GRADING, SURFACING, BRIDGE & SEEDING – SW 107th Street over Elm Run / OSN 332

Article 2. **Engineer.**

The project has been designed by Finney & Turnipseed Transportation & Civil Engineering LLC, Topeka, Kansas. The Design Engineer, is hereinafter designated as the Engineer and is to act as Owner's project representative, assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

Article 3. Calendar Completion Date Contract.

3.1. This is a Calendar Completion Date contract. The Work will commence with an issuance of a Work Order by the Owner on Monday September 15, 2023 provided the Contractor complies with the required submittal times for the executed Agreement and its counterparts, and be Substantially Completed on or before Close of Business Friday, December 15, 2023 and Completed and Ready for Final Payment and Acceptance in accordance with paragraph 14.13 of the General Conditions on or before Close of Business Friday, December 22, 2023.

3.2. Liquidated Damages. Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed by the calendar completion dates specified in paragraph 3.1 above. They also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner according to the following schedule:

Contract Amount	Substantial Completion Liquidated Damages	Final Payment and Acceptance Liquidated Damages
$0 to $500,000	$750.00	$750.00
$500,000.01 to $1,000,000	$1,250.00	$750.00
$1,000,000.01 to $$1,500,000	$2,000.00	$1,250.00
$1,500,000.01 to $2,000,000	$2,500.00	$1,500.00
$2,000,000.01 to $5,000,000	$3,000.00	$2,000.00
$5,000,000.01 and up	$5,000.00	$3,000.00

For each day that expires after the date specified in paragraph 3.1 for Substantial Completion until the work is certified by the engineer as Substantially Complete and after certification of Substantial Completion if Contractor neglects, refuses or fails to complete the remaining Work by the calendar completion date for Final Payment and Acceptance. The Owner shall deduct the accrued liquidated damages from the final payment due to the Contractor.

Article 4. Contract Price.

4.1. Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents in current funds as per the Contractor's Bid, which is attached as an exhibit to this Agreement.

Article 5. Payment Procedures.

Applications for Payment shall be in accordance with Article 14 of the General Conditions.

5.1. Progress Payments. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's signed Applications for Payment as recommended by Engineer within thirty-five (35) days following the end of the period for which payment is being requested, provided the application for payment is submitted within seven (7) days following the end of the period. Period shall end on the last calendar day of each month. All progress payments will be based on the number of units or estimated percentage of the Work completed in accordance with paragraph 14.1 of the General Conditions.

5.1.1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as Engineer shall determine, or Owner may withhold, in accordance with paragraph 14.7 of the General Conditions.

(1) 90% of Work completed. If the project has been 50% completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to

Owner and Engineer upon written request by the Contractor, Owner, may determine that as long as the character and progress of the Work remain satisfactory to them, that the retainage on account of Work completed be reduced or eliminated. Reduction or elimination of the retainage will be at the sole discretion of the Owner.

(2) 0 % of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to Owner as provided in paragraph 14.2 of the General Conditions).

5.1.2. Upon Substantial Completion, in an amount sufficient to increase total payments to Contractor to 95% of the Contract Price, less such amounts as Engineer shall determine, or Owner may withhold, in accordance with paragraph 14.7 of the General Conditions.

5.2. Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said paragraph 14.13.

5.3. Interest. All monies not paid when due hereunder shall not bear interest.

Article 6. Contractor's Representations.

In order to induce Owner to enter into this Agreement, Contractor represents that he fully complies with the requirements stated in paragraphs 3b. through 3g. of the Bid Form, which is attached as an exhibit to this Agreement.

Article 7. Contract Documents.

The Contract Documents which comprise the entire agreement between Owner and Contractor concerning the Work consist of the following:

7.1. This Agreement.

7.2. Performance and other Bonds contained in this Project Manual.

7.3. Work Order.

7.4. General Conditions, Doc 700.

7.5. Supplementary Conditions contained in this Project Manual, if any.

7.6. City of Topeka and Shawnee County Standard Technical Specifications, 2016 Edition with any addenda thereto and KDOT Standard Specification for Road & Bridges, latest edition with any addenda thereto.

7.7. Specifications contained in this Project Manual, if any.

7.8. Project Drawings, bearing the following title: Grading, Surfacing, Bridge & Seeding – Project No. S-121045.00: SW 107th Street over Elm Run / OSN 332.

7.9. Addenda _____ to _____, inclusive.

7.10. Contractor's Bid, including all attachments to Bid, which is attached as an exhibit to this Agreement.

7.11. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Change Orders and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.4 and 3.5 of the General Conditions.

There are no Contract Documents other than those listed above in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

Article 8. Suspension of Contractor.

8.1. Contractor may be placed on Owner's "List of Suspended Contractors" for a period of time from the date of written notification by Owner if Contractor fails to perform in accordance with specific provisions stated in paragraph 8.2 of this Article 8. The period of Suspension shall be established as follows:

First Suspension - l year
Second Suspension - 2 years
Third Suspension - Permanent

During the period of suspension, the Contractor will not be permitted to submit a bid to Owner to perform Work either directly or indirectly or as a subcontractor.

8.2. The Contractor shall be suspended upon written notification by Owner:

8.2.1. If Contractor exceeds the date established for substantial completion or final payment and acceptance as indicated in paragraph 3.1, or

8.2.2. Upon occurrence of any of the events stated in paragraph 15.2 of the General Conditions.

8.2.3. If Contractor fails to complete any outstanding “One-Year Correction Period” work, as defined in paragraph 13.12 of the General Conditions, on previously completed projects within 90 calendar days of written notification by the Owner, the Contractor will be placed on Owners “List of Suspended Contractors”, as defined in paragraph 8.1, Article 8. Suspension of Contractor, and shall remain suspended until such time as the corrective work has been certified as complete in writing by the Owner.

Article 9. Miscellaneous.

9.1. Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

9.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3. Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to Owner, Contractor and Design Engineer. All portions of the Contract Documents have been signed or identified by Owner and Contractor or by Design Engineer on their behalf.

OWNER: Shawnee County, Kansas

By: _____
Chair,
Board of County Commissioners

Attest: _____
Shawnee County Clerk

Date: _____

CONTRACTOR _____

_____

By: _____

[CORPORATE SEAL]

Attest: _____

Attachment To
Shawnee County Contract C_____

CONTRACTUAL PROVISIONS ATTACHMENT

The undersigned parties agree that the following provisions are hereby incorporated into the contract to which it is attached and made a part thereof, said contract being dated the _____ day of _____, 2023.

1. **TERMS HEREIN CONTROLLING PROVISIONS**. It is expressly agreed that the terms of each and every provision in this attachment shall prevail and control over the terms of any other conflicting provision in any other document relating to and a part of the contract in which this attachment is incorporated.

2. **AGREEMENT WITH KANSAS LAW**. It is agreed by and between the undersigned that all disputes and matters whatsoever arising under, in connection with or incident to this contract shall be litigated, if at all, in and before a Court located in the State of Kansas, U.S.A., to the exclusion of the Courts of any other states or country. All contractual agreements shall be subject to, governed by, and construed according to the laws of the State of Kansas.

3. **TERMINATION DUE TO LACK OF FUNDING APPROPRIATION**. Shawnee County is subject to the Kansas Cash Basis Law, K.S.A. 10-1101 *et seq.* If, in the judgment of the Financial Administrator, Audit-Finance Office, sufficient funds are not appropriated to continue the function performed in this agreement and for the payment of the charges hereunder, County may terminate this agreement at the end of its current fiscal year. County agrees to give written notice of termination to contractor at least thirty (30) days prior to the end of its current fiscal year. In the event this agreement is terminated pursuant to this paragraph, County will pay to the contractor all regular contractual payments incurred through the end of such fiscal year. The termination of the contract pursuant to this paragraph shall not cause any penalty to be charged to the County or the contractor.

4. **DISCLAIMER OF LIABILITY**. Neither the County of Shawnee nor any department thereof shall hold harmless or indemnify any contractor for any liability whatsoever.

5. **ANTI-DISCRIMINATION CLAUSE**. The contractor agrees: (a) to comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 *et seq*.) and the Kansas Age Discrimination in Employment Act, (K.S.A. 44-1111 *et seq*.) and the applicable provisions of the Americans With Disabilities Act (42 U.S.C. 12101 *et seq*.) [ADA] and to not discriminate against any person because of race, religion, color, sex, disability, national origin or ancestry, or age in the admission of access to or treatment or employment in, its programs or activities; (b) to include in all solicitations or advertisements for employees, the phrase "equal opportunity employer"; (c) to comply with the reporting requirements set out in K.S.A. 44-1031 and K.S.A. 44-1116; (d) to include those provisions in every subcontract or purchase order so that they are binding upon such subcontractor or vendor; (e) that a failure to comply with the reporting requirements of (c) above or if the contractor is found guilty of any violation of such acts by the Kansas Human Rights Commission, such violation shall constitute a breach of contract; (f) if the contracting agency determines that the contractor has violated applicable provisions of ADA, that violation shall constitute a breach of contract; (g) if (e) or (f) occurs, the contract may be cancelled, terminated or suspended in whole or in part by the County. Parties to this contract understand that subsections (b) through (e) of this paragraph number 5 are not applicable to a contractor who employs fewer than four employees or whose contract with the County totals $5,000 or less during this fiscal year.

6. **ACCEPTANCE OF CONTRACT**. This contract shall not be considered accepted, approved or otherwise effective until the required approvals and certifications have been given and this is signed by the Board of County Commissioners of the County of Shawnee, Kansas.

7. **ARBITRATION, DAMAGES, WARRANTIES**. Notwithstanding any language to the contrary, no interpretation shall be allowed to find the County has agreed to binding arbitration, or the payment of damages or penalties upon the occurrence of a contingency. Further, the County shall not agree to pay attorney fees and late payment charges; and no provisions will be given effect which attempts to exclude, modify, disclaim or otherwise attempt to limit implied warranties of merchantability and fitness for a particular purpose.

8. **REPRESENTATIVE'S AUTHORITY TO CONTRACT**. By signing this document, the representative of the contractor thereby represents that such person is duly authorized by the contractor to execute this document on behalf of the contractor and that the contractor agrees to be bound by the provisions thereof.

9. **RESPONSIBILITY FOR TAXES**. The County shall not be responsible for, nor indemnify a contractor for, any federal, state or local taxes which may be imposed or levied upon the subject matter of this contract.

10. **INSURANCE**. The County shall not be required to purchase, any insurance against loss or damage to any personal property to which this contract relates, nor shall this contract require the County to establish a "self-insurance" fund to protect against any such loss or damage. Subject to the provisions of the Kansas Tort Claims Act (K.S.A. 75-6101 *et seq*.), the vendor or lessor shall bear the risk of any loss or damage to any personal property to which vendor or lessor holds title.

11. **AUTOMATED CLEARING HOUSE (ACH)**. Shawnee County prefers to pay its vendor invoices via electronic funds transfers through the automated clearing house (ACH) network. Shawnee County may require vendors to accept payments via ACH. To initiate payment of invoices, vendors shall execute the County's standard ACH Vendor Payment Authorization Agreement. Upon verification of the data provided, the Payment Authorization Agreement will authorize the County to deposit payment for services rendered or goods provided directly into vendor accounts with financial institutions. All payments shall be made in United States currency.

VENDOR/CONTRACTOR:

_____
By:

_____
Title:

_____
Date:

BOARD OF COUNTY COMMISSIONERS
SHAWNEE COUNTY, KANSAS

_____
William D. Riphahn, Chair

_____
Date:

ATTEST:

_____
Cynthia A. Beck, Shawnee County Clerk

Performance Bond

Any singular reference to Contractor, Surety, Owner of other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address): Board of County Commissioners
Shawnee County Courthouse
200 E. 7th Street
Topeka, Kansas 66603

CONTRACT
Date:
Amount:
Description (Name and Location): Project No. S-121045.00
SW 107th Street over Elm Run

BOND
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:
	(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:

EJCDC No. 1910-28-A (1996 Edition)
Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Contract, which is incorporated herein by reference.

2. If the CONTRACTOR performs the Contract, the Surety and the CONTRACTOR have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:

3.1. The OWNER has notified the CONTRACTOR and the Surety at the addresses described in paragraph 10 below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the OWNER's right, if any, subsequently to declare a CONTRACTOR Default; and

3.2. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR's right to complete the Contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and Surety have received notice as provided in paragraph 3.1; and

3.3. The OWNER has agreed to pay the Balance of the Contract Price to:

3.3.1. The Surety in accordance with the terms of the Contract;

3.3.2. Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

4. When the OWNER has satisfied the conditions of paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or

4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the OWNER the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR Default; or

4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances;

4.4.1. After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment therefor to the OWNER; or

4.4.2. Deny liability in whole or in part and notify the OWNER citing reasons therefor.

5. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided in paragraph 4.4, and the OWNER refuses the payment tendered or the Surety has denied pliability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.

6. After the OWNER has terminated the CONTRACTOR's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Contract. To a limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

6.1. The responsibilities of the CONTRACTOR for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from the CONTRACTOR's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by the OWNER to the CONTRACTOR under the Contract after all proper adjustments have been made, including allowance to the CONTRACTOR of any amounts received or to be received by the OWNER in settlement of insurance or other Claims for damages to which the CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Contract.

12.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

12.3. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. OWNER Default: Failure of the OWNER, which has neither been remedied not waived, to pay the CONTRACTOR as required by the Contractor or to perform and complete or comply with the other terms thereof.

(FOR INFORMATION ONLY---Name, Address and Telephone)
AGENT or BROKER: OWNER'S REPRESENTATIVE (Engineer or other party):

STATUTORY BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT we, the undersigned _____ of _____, hereinafter referred to as "CONTRACTOR", and _____ a corporation organized under the laws of the State of _____, and authorized to transact business in the State of Kansas, as "Surety", are held and firmly bound unto the State of Kansas, in the penal sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, or heirs, executors, administrators, successors and assigns, jointly and severally by these presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the above bonded CONTRACTOR has, on the _____ day of _____, 2023, entered into the Public Improvement Agreement with the Shawnee County, Kansas, for the construction of the public improvements described in the attached contract documents and below.

Grading, Surfacing, Bridge and Seeding Project S-121045.00: SW 107th Street over Elm Run/OSN 332

Date of Project: August 28, 2023

NOW, THEREFORE, if the CONTRACTOR and his SUBCONTRACTORS shall pay all indebtedness incurred for supplies, materials, or labor furnished, used or consumed in connection with, or in, or about the construction or making of, public improvements, including gasoline, lubricating oils, fuel oils, greases, coal, and similar items used or consumed directly in furtherance of such improvements, this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED FURTHER, that the surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract or to the specifications.

PROVIDED FURTHER, that the surety agrees that any person to whom there is due any sum for supplies, materials, or labor, as herein before stated, or his assigns, may bring an action on this bond for the recovery of the indebtedness; PROVIDED, that no action shall be brought on the bond after six (6) months from the completion of the public improvements.

IN TESTIMONY WHEREOF, the CONTRACTOR has hereunto set his hand, and said surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact duly authorized to do so at _____ on this _____ day of _____, 2023_.

_____
NAME

_____
(NAME PRINTED)

_____
(ADDRESS)

_____
(TELEPHONE)

_____
BY

_____
TITLE

_____
Surety

By_____
Attorney-in-Fact

_____
Address

_____
Phone No.

By_____
State Representative

(Accompany this bond with the attorney-in-fact's authority from the surety company certified to include the date of bond).

WHEREBY certify that the above bond is approved and that said bond has been filed in the records of _____ County, this _____ day of _____, 2023_.

_____
Clerk of the District Court

DOCUMENT 700

GENERAL CONDITIONS
CALENDAR COMPLETION DATE CONTRACT

FOR

SHAWNEE COUNTY

DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION PROJECTS

CALENDAR COMPLETION DATE

7/1/13

TABLE OF CONTENTS OF GENERAL CONDITIONS

CALENDAR COMPLETION DATE

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

Addenda - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

Agreement - The written agreement between Owner and Contractor covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - A form acceptable to the Owner which is to be used by Engineer in preparation of progress or final payments for signature by the Contractor and which is to include such supporting documentation as is required by the Contract Documents.

Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bonds - Bid, performance and statutory bonds and other instruments of security.

Change Order - A document recommended by Engineer, which is signed by Contractor and Owner and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price, issued on or after the Effective Date of the Agreement.

County Engineer - The County Engineer of Shawnee County or authorized representatives of the Public Works Department of Shawnee County.

Contract Documents - The Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the bid and any post-Bid documentation submitted prior to the Award of contract) the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

Contract Price - The moneys payable by Owner to Contractor under the Contract Documents as stated in the Agreement.

Contractor - The person, firm or corporation with whom Owner has entered into the Agreement.

Calendar Completion Date – Dates specified in of Article 3, Paragraph 3.1 of the Agreement stipulating the date for Substantial Completion and the date the project is ready for Final Payment and Acceptance.

Defective - An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the

protection thereof has been assumed by Owner at Substantial Completion in accordance with paragraph 14.8 or 14.10).

Design Engineer - The person, firm or corporation responsible for the design of the project and named as such in the Agreement.

Drawings - The drawings which show the character and scope of the work to be performed and which have been prepared or approved by Engineer and are referred to in the Contract Documents.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Engineer - The Engineer shall be either the Design Engineer, County Engineer or the Owner's Project Representative as designated in the Agreement.

Field Order - A verbal or written order issued by Engineer which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price.

Final Acceptance – The date when the Owner accepts in writing that the construction of the project is complete in accordance with the Contract Documents such that the entire project can be utilized for the purposes for which it is intended and Contractor is entitled to final payment.

Final Completion – The date when the construction of the project is complete and all identified incomplete or defective items of work have been corrected to the satisfaction of the Engineer and all required documents have been submitted, including but not limited to Final Application for Payment.

Force Account Work - Work authorized and approved by the Owner to be paid on the basis of actual cost in accordance with paragraphs 11.4 through 11.7.

Laws and Regulations; Laws or Regulations - Laws, rules, regulations, ordinances, codes and/or orders.

Owner – Shawnee County, Kansas with whom Contractor has entered into the Agreement and for whom the Work is to be provided.

Owner's Project Representative - The authorized representative of the Owner, who is assigned to the project or any part thereof with the authority to act on behalf of the Owner.

Pdf format: All documents submitted electronically shall be submitted in Portal Document Format.

Partial Utilization - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

Project - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

Specifications – Kansas Department of Transportation Standard Road and Bridge Specifications and

City of Topeka and Shawnee County Standard Technical Specifications, latest editions or the portion of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor - An individual, firm or corporation having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

Submittal – Shop drawing, certification, test result or other required documentation regarding any portion of the Work.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer as evidenced by Engineer's notice of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions - The part of the Contract Documents which amends, modifies or supplements these General Conditions, other provisions of the Contract Documents, the Standard Technical Specifications or the Drawings.

Supplier - A manufacturer, fabricator, supplier, distributor, or vendor.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

Work Change Directive - A written directive to Contractor, issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Change Directive may not change the contract Price, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by parties as to its effect, if any, on the Contract Price as provided in paragraph 10.2.

Work Order - A written notice given by Owner to Contractor fixing the date on which the Contract Work will commence to run and on which Contractor shall start to perform Contractor's obligations under the Contract Documents.

ARTICLE 2 - PRELIMINARY MATTERS

Delivery of Bonds and Evidence of Insurance:

2.1. When Contractor delivers the executed Agreements to Owner, Contractor shall also deliver to Owner such Bonds as Contractor may be required to furnish in accordance with paragraph 5.1. Contractor shall also deliver with the executed Agreements certificates of insurance which Contractor is required to purchase and maintain in accordance with paragraphs 5.3 through 5.7. All Certificates of Insurance shall utilize the ACORD 25-S form, most recent revision date.

Copies of Documents:

2.2. Owner shall furnish to Contractor up to three (3) copies (unless otherwise specified in the Supplementary Conditions) of the Contract documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Work:

2.3. Contract Work will commence on the day indicated on the Work Order. A Work Order will be issued by the Owner or Engineer on the date specified in Article 3, Paragraph 3.1 of the Agreement.

Starting the Project:

2.4. Contractor shall start to perform the Work on the date stated on the Work Order, but no Work shall be done at the site prior to the date stated on the Work Order.

Before Starting Construction:

2.5. Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby; however, Contractor shall not be liable to Owner, or Engineer for failure to report any conflict, error or discrepancy in the Contract Documents, unless Contractor had actual knowledge thereof or should reasonably have known thereof.

Schedule Requirements:

2.6.1. The Contractor shall submit, with the executed Agreement and Contract

Documents, a schedule of proposed construction operations which is acceptable to the Owner for any project with a substantial completion time greater than 60 days or with a calendar completion date as defined in paragraph 3.1 of the Agreement; however, on any project for which more than one pay application will be submitted, a schedule of proposed construction operations shall be submitted. The schedule shall comply with all provisions of this specification. The schedule shall be a bar graph type schedule which identifies the target starting and completion dates for each bid item of the Work. The schedule shall indicate completion of the various parts of the Work and the total project by the calendar completion dates called out in the Agreement.

The schedule will be used to monitor the performance of the Contractor and shall be monitored and updated monthly or more frequently if deemed necessary by the Engineer during the course of the project. Contractor shall submit the updated and/or revised project schedule with the signed monthly application for payment in accordance with paragraph 14.2. Should the Work fall significantly (20%) behind schedule, the Contractor shall submit a revised schedule detailing corrective measures to be taken to complete the project by the calendar completion date specified in the Agreement. Owner may require Contractor to add to his equipment or construction forces, as well as increase the working hours, if operations fall behind schedule at any time during the construction period. Owner may require Contractor to reimburse Owner for all costs, including charges of Engineer and Owner's professional consultants, caused by any increase in Contractor's allowable working hours as defined below. Owner may deduct such costs from any payment due Contractor.

The following requirements shall be taken into consideration in preparing the schedule of construction operations: No Work shall be done between the hours of 8:00 p.m. and 6:00 a.m., without permission of Owner, except such Work as may be necessary for the proper care, maintenance, and protection of the Project, or in the case of an emergency. Such permission may be granted or denied at the complete discretion and convenience of the Owner and, if granted, may be revoked at any time if the Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work and all operations performed thereunder, or if the Contractor fails to comply with any conditions of the Owner's authorization.

2.6.2. The Engineer shall provide Contractor, prior to the date of the Preconstruction Conference, a schedule of required submittals. Contractor shall provide all Submittals promptly to Engineer for review to avoid delay in any activity beyond the scheduled start date. Sufficient time shall be allowed for initial review, corrections and resubmission, and final review of each submittal. Engineer will be given a minimum ten (10) days to review each submittal. Initial schedule shall not limit Engineer’s ability to require additional submittals as deemed necessary throughout the project. In no instance shall any portion of the Work requiring a submittal, as listed on initial schedule or otherwise, be incorporated into work until said submittal has been approved by Engineer.

Preconstruction Conference:

2.7. A Preconstruction Conference attended by Contractor, Engineer and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work. The Contractor's representative shall be the resident superintendent or an individual fully qualified and knowledgeable of the Contractor's field operations, either of whom shall have the authority to act, separately or together, on behalf of the Contractor on a daily basis throughout the duration of the contract.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

3.1. The Contract Documents comprise the entire agreement between Owner and Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with all applicable laws and ordinances.

3.2. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids). However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of Owner, Contractor, Engineer, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in paragraph 9.4.

3.3. If, during the performance of the Work, Contractor finds a conflict, error or discrepancy in the Contract Documents, Contractor shall so report to Engineer in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from Engineer; however, Contractor shall not be liable to Owner, Engineer for failure to report any conflict, error or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof or should reasonably have known thereof.

Amending and Supplementing Contract Documents:

3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.4.1. A Change Order (pursuant to paragraph 10.4),

or

3.4.2. A Work Change Directive (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2, Contract Price may only be changed by a Change Order.

3.5. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.5.1. A Field Order (pursuant to paragraph 9.5),

3.5.2. Engineer's approval of a Submittal or sample (pursuant to paragraphs 6.26 and 6.27), or

3.5.3. Engineer's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.6. Neither Contractor nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with Owner shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of Design Engineer; and they shall not reuse any of them on extensions of the Project or any other project without written consent of Owner and Design Engineer and specific written verification or adaptation by Design Engineer.

ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; CONSTRUCTION LAYOUT

Availability of Lands:

4.1. Owner shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of Contractor. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by Owner, unless otherwise provided in the Contract Documents. Temporary easements will be provided to accommodate normal construction methods and the Contractor may be required to protect designated structures or vegetation from damage. The Contractor may provide additional lands required for temporary construction facilities and storage of materials and equipment at his own

expense. Evidence, in writing, of permission to occupy or use areas outside the limits of public right-of-way or easements provided by the Owner shall be supplied to the Engineer.

Physical Conditions:

4.2.1. Explorations and Reports: Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by Design Engineer in preparation of the Contract Documents. These reports are not guaranteed as to accuracy or completeness, nor are they part of the Contract Documents. Contractor shall have full responsibility with respect to subsurface conditions at the site.

4.2.2. Existing Structures: Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by the Design Engineer in preparation of the Contract Documents. Contractor may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for Contractor's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, Contractor shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3. Report of Differing Conditions: If Contractor believes that:

4.2.3.1. Any technical data on which Contractor is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. Any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents,

Contractor shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22), notify Owner and Engineer in writing about the inaccuracy or difference.

4.2.4. Engineer's Review: Engineer will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

4.2.5. Possible Document Change: If Engineer concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6. Possible Price Adjustments: In each such case, an increase or decrease in the Contract Price, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If Owner and Contractor are unable to agree as to the amount , a claim may be made therefor as provided in Articles 11.

Physical Conditions - Underground Facilities:

4.3.1. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to Owner or Design Engineer by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1. Owner and Design Engineer shall not be responsible for the accuracy or completeness of any such information or data; and,

4.3.1.2. Contractor shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2. Not Shown or Indicated. If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which Contractor could not reasonably have been expected to be aware of, Contractor shall promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the Owner of such Underground Facility and give written notice thereof to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. Contractor may be allowed an increase in the Contract Price, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which Contractor could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount thereof, Contractor may make a claim therefor as provided in Articles 11.

Reference Points:

4.4.1 Engineer shall provide engineering surveys to establish reference points and

benchmarks for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall protect and preserve the established reference points and benchmarks and shall make no changes or relocations without the prior written approval of Engineer. Contractor shall report to Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

4.4.2. The Contractor shall protect from physical disturbance all monuments and benchmarks of the City, County, State or Federal Government without the prior written approval of the Owner or until they have been removed, witnessed or otherwise disposed of by the Engineer.

Construction Layout:

4.5. The County Engineer, or the Design Engineer, as designated at the pre-construction conference, will provide construction layout (staking) of all improvements at no cost to the Contractor. The Contractor shall be responsible for scheduling staking and shall provide the Engineer with at least 48 hours notice prior to the time staking is required. The Contractor must satisfy himself as to the meaning of all stakes and marks prior to start of any construction activity based on those stakes. The Engineer assumes no liability for stakes that are misinterpreted by the Contractor or are damaged due to any activity. Once stakes are set and marked, it is the Contractor's responsibility to preserve them from all types of damage, and in the event of his failure to do so, Contractor shall pay the Engineer to reset the stakes.

ARTICLE 5 - BONDS AND INSURANCE

Performance and Statutory Bonds:

5.1. Performance Bond. Contractor shall furnish a performance bond, in an amount equal to the Contract Price as security for the faithful performance of all Contractor's obligations under the Contract Documents. The performance bond shall remain in effect at least until one (1) year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. The performance bond shall acknowledge the one year correction period in accordance with the requirements of Article 13.

5.1.1 Statutory Bond (K.S.A. 60-1111). Contractor shall provide and file with the Clerk of the District Court of Shawnee County, a Kansas statutory bond, in an approved form and in an amount equal to the Contract Price, to ensure payment of all indebtedness incurred for <u>all</u> supplies, materials, or labor furnished, used or consumed in connection with, in, or about the construction or making of, public improvements.

5.1.2 All Bonds shall be in the forms prescribed by Law, Regulation, or by the Contract Documents and be executed by such sureties who are authorized to conduct business in the State of Kansas and who are named in the current list of "Companies Holding Certificates of

Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act. The name of the Contractor on this Agreement, bonds, and certificate of insurance shall be identical.

5.2. If the surety on any Bond furnished by Contractor is declared ~~a~~ bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which must be acceptable to Owner.

Contractor's Liability Insurance:

5.3. Contractor shall purchase and maintain such commercial general liability and other insurance as is appropriate for the Project and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance and furnishing of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

5.3.1. Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts, including "all-states" endorsement, as per state and federal statutory requirements.

5.3.2. Employers Liability Insurance covering claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees with a $500,000.00 each person, limit.

5.3.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

5.3.4. Claims for property damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom;

5.3.5. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

5.3.6. The commercial general liability insurance required under paragraphs 5.3.3 through 5.3.5 shall have the following specific coverages:

(1) Bodily Injury (including completed operations and products liability):

$ 500,000	Each Occurrence
$1,000,000	Annual Aggregate

Property Damage:

$ 500,000	Each Occurrence
$1,000,000	Annual Aggregate

or a combined single limit of $1,000,000

(2) Personal Injury, with employment exclusion deleted:

$1,000,000	Annual Aggregate

(3) Excess Liability:

Bodily Injury and Property Damage Combined:

$1,000,000	Each Occurrence
$1,000,000	Annual Aggregate

The commercial general liability insurance shall include completed operations insurance. Property Damage liability insurance shall be provided with coverages for explosion, collapse, and underground hazards, where applicable. The Owner shall be named as an additional insured on the Contractor's general liability policy.

5.3.7. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle. Coverages for hired car and employee non-owned auto liability shall also be provided. The coverage limits shall be:

(1) Bodily Injury:

$ 500,000	Each Person
$1,000,000	Each Occurrence

(2) Property Damage:

$ 500,000	Each Occurrence

or a combined single limit of $1,000,000

Contractual Liability Insurance:

5.4. The commercial general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to Contractor's obligations under paragraphs 6.30 and 6.31. The coverage limits shall be:

(1) Bodily Injury:

$ 500,000	Each Occurrence

(2) Broad Form Property Damage:

$ 500,000	Each Occurrence
$1,000,000	Annual Aggregate

Property Insurance:

5.5. Contractor shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as required by Laws and Regulations) for all projects which include construction of or modification to above ground structures. This insurance shall include the interests of Owner, Contractor, and Subcontractors all of whom shall be listed as insured or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse, and water damage, and shall include damages, losses, and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance, Contractor shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

5.6. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by Laws and Regulations which will include the interests of Owner, Contractor, and Subcontractors all of whom shall be listed as insured or additional insured parties.

Owners Liability Insurance:

5.7. Contractor, at his sole expense, shall purchase Owner's Protective Liability Insurance. This insurance shall be maintained in full force and effect for the duration of the Contract by Contractor and shall name the Owner as the named Insured.

This insurance shall have the same limits of liability as the commercial general liability insurance and shall protect Owner against any and all claims and liabilities for injury to or death of persons, or damage to property caused in whole or in part by, or alleged to have been caused in whole or in part by, the negligent acts or omissions of Contractor or Subcontractors or any agent, servant, worker, or employee of Contractor or Subcontractor arising from the operations or Work for the project.

Notice of Cancellation:

5.8. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) in accordance with paragraphs 5.3 through 5.7 shall contain a provision or endorsement that the coverage afforded will not be canceled, materially

changed or renewal refused until at least thirty (30) days prior written notice has been given to Owner by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with paragraph 13.12. In addition, Contractor shall maintain such completed operations insurance for one (1) year after final payment and furnish Owner with evidence of continuation of such insurance at final payment.

Receipt and Application of Proceeds:

5.9. Any insured loss under the policies of insurance required by paragraphs 5.5 and 5.6 will be adjusted with Owner and made payable to Owner as trustee for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.12. Owner shall deposit in a separate account any money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order.

5.10. Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, Owner as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

Acceptance of Insurance:

5.11. If Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor in accordance with paragraphs 5.3 through 5.7 on the basis of its not complying with the Contract Documents, Owner shall notify Contractor in writing thereof within thirty (30) days of the date of delivery of such certificates to Owner in accordance with paragraph 2.1. Contractor shall provide to Owner such additional information in respect of insurance provided by Contractor as Owner may reasonably request. Failure by Owner to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by Contractor as complying with the Contract Documents.

Partial Utilization - Property Insurance:

5.12. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10. Property Insurance shall not be canceled or lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but Contractor shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.2. Contractor shall keep on site at all times during Work progress a competent resident superintendent, who shall not be replaced without written notice and approval of the Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the site and shall have full authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to Contractor. Failure to comply with this requirement may result in the suspension of work or termination of the contract.

Labor, Materials and Equipment:

6.3. Contractor shall provide competent, suitably qualified personnel to perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during the allowable working hours as defined in paragraph 2.6.1.

6.4. Unless otherwise specified in the Supplementary Conditions, Contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to Engineer any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

6.5.1. Salvaged Materials. All materials designated for salvage during the progress of

the Work and or specified to be reused in new construction, shall remain the property of the Owner. Salvaged materials shall be delivered and neatly piled at any point within the public right-of-way which is designated by the Owner or Engineer. Transportation and handling shall be at the Contractor's expense. Salvaged materials will be considered to be in the custody of the Contractor, and he will be held responsible for their care and protection and must cover any losses resulting from damage, theft, or misappropriation while they remain on the job site or while enroute to the place of storage.

6.5.2. Storage of Materials. All materials delivered to and stored on the project site shall be neatly placed to minimize obstruction and allow for convenient inspection. No materials or equipment shall be stored within five (5) feet of fire hydrants or trees which are to be protected. All fire hydrants shall remain readily accessible to the Fire Department throughout the project unless otherwise approved by the Owner.

Adjusting Progress Schedule:

6.6. Contractor shall submit to Engineer, for acceptance as defined in paragraph 2.6.1, any adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any other provisions of the Contract Documents applicable thereto.

Substitutes of "Or-Equal" Items:

6.7.1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by Engineer if sufficient information is submitted by Contractor to allow Engineer to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by Engineer will include the following. Requests for review of substitute items of material and equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish at Contractor's expense additional data about the proposed substitute.

6.7.2. If a specific means, method, technique, sequence or procedure of construction is

indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to Engineer, if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by Engineer will be similar to that provided in paragraph 6.7.1 as applied by Engineer.

6.7.3. Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. Engineer will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a Change Order or an approved Submittal.

Concerning Subcontractors, Suppliers and Others:

6.8.1. Contractor shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to Owner and Engineer as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom Owner or Engineer may have reasonable objection. Contractor shall not employ any Subcontractor who is on the Owner's "List of Suspended Contractors" at the date of the Opening of Bids. Contractor shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom Contractor has reasonable objection.

6.8.2. If the Owner requests the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement for acceptance by Owner and Engineer and if Contractor has submitted a list thereof in accordance with said request, Owner's or Engineer's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case Contractor shall submit an acceptable substitute. No acceptance by Owner or Engineer of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

6.8.3. The amount of the work performed by Subcontractors in aggregate shall not exceed seventy (70) percent of the total Contract Price as determined based on the units of work to be performed by Subcontractors at the actual unit prices contained in the Agreement. For the purposes of this paragraph 6.8.3, "work" shall include all services, labor, equipment and materials associated with each specific item of the contract. The purchase of materials by the Contractor for use by Subcontractors in completing the project shall not be credited toward the amount of work performed by the Contractor. If Engineer has reason to believe that any unit price contained in the agreement does not represent a reasonable price for the Work involved with the specific item, Contractor

shall furnish full documentation of the unit price(s) determination in accordance with the provisions of paragraphs 11.4, 11.5 and 11.6. If deemed necessary by the Engineer, the unit price shall be adjusted, the purposes of determining subcontractor participation only, based on a determination of costs in accordance with paragraphs 11.4, 11.5 and 11.6. If specific units of Work involve more than one Subcontractor, Contractor shall provide documentation which enables Engineer to determine the portion of the unit price attributable to each Subcontractor. If it is determined during the course of the Work that the aggregate amount of the work being performed by subcontractors exceeds seventy (70) percent of the Contract Price, Contractor shall take appropriate actions to comply with the requirements of this paragraph 6.8.3.

6.9. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of Owner or Engineer to pay or to see to the payment of any monies due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

6.10. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.11. All Work performed for Contractor by a Subcontractor will be pursuant to an appropriate agreement between Contractor and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Contractor shall pay each Subcontractor a just share of any insurance moneys received by Contractor on account of losses under policies issued pursuant to paragraphs 5.5 and 5.6.

Patent Fees and Royalties:

6.12. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents. Contractor shall indemnify and hold harmless Owner and Engineer and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorney's fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in

the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

Permits:

6.13. The Owner will obtain permits required for work in highways, railroads and regulation of other governmental agencies. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all other construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or if there are no Bids, on the Effective Date of the Agreement. Contractor shall pay all charges of utility owners for connections to the Work, and Owner shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

Laws and Regulations:

6.14.1. Contractor shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations. Specifically, the Contractor shall observe all applicable provisions of K.S.A. 44-201 and any amendments thereto in effect as of the Effective Date of Agreement.

6.14.2. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, Contractor shall give Engineer prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If Contractor performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to Engineer Contractor shall bear all costs arising therefrom; however, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Taxes:

6.15. For all projects, payment of the Kansas State Sales Tax or Compensating Tax is not required. Shawnee County will furnish an exemption certificate (including exemption certificate number) obtained from the Sales and Compensating Tax Division, of the Department of Revenue of the State of Kansas to the Contractor, Subcontractor or repairman making purchases of any tangible personal property to be incorporated in this project. The Contractor, Subcontractor or repairman must furnish all suppliers with a copy of the properly executed exemption certificate secured for this project. He may reproduce as many copies of the certificate as he may need.

Use of Premises:

6.16. Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against Owner or Engineer by any such owner or occupant because of the performance of the work, Contractor shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim at law. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold Owner, and Engineer harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court costs) arising directly indirectly or consequentially out of any action, legal or equitable, brought by any such other party against Owner or Engineer to the extent based on a claim arising out of Contractor's performance of the Work.

6.17. During the progress of the Work, Contractor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by Owner. Contractor shall restore to original condition all property not designated for alteration by the Contract Documents

6.18. Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

Documents On-Site:

6.19. Contractor shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order. These documents together with all approved samples and a counterpart of all approved Submittals will be available to Engineer for reference.

Safety and Protection:

6.20. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1. All employees on the Work and other persons and organizations who may be

affected thereby;

6.20.2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

Contractor shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner, or Design Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor). Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21. Contractor shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated in writing by Contractor to Owner.

Emergencies:

6.22. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, Contractor, without special instruction or authorization from Engineer or Owner, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If Engineer determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Change Directive or Change Order will be issued to document the consequences of the changes or variations.

Submittals:

6.23. After checking and verifying all field measurements, Contractor shall submit to Engineer for review and approval in accordance with the accepted schedule of Submittals (see paragraph 2.6.2), or for other appropriate action if so indicated in the Supplementary Conditions, a pdf formatted copy (via electronic mail) of all submittals (unless otherwise specified), which bear a

stamp or written indication that Contractor has satisfied Contractors responsibilities under the contract documents with respect to the submission. All submissions will be identified as Engineer may require. The data shown on the Submittals will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable Engineer to review the information as required.

6.24. Contractor shall also submit to Engineer for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1. Before submission of each Submittal or sample Contractor shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Submittal or sample with other Submittals and samples and with the requirements of the Work and the Contract Documents.

6.25.2. At the time of each submission, Contractor shall give Engineer specific written notice of each variation that the Submittal or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Submittal submitted to Engineer for review and approval of each such variation.

6.26. Engineer will review and approve with reasonable promptness Submittals and samples, but Engineer's review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. Contractor shall make corrections required by Engineer, and shall return the required number of corrected copies of Submittals and submit as required new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.27. Engineer's review and approval of Submittals or samples shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has in writing called Engineer's attention to each such variation at the time of submission as required by paragraph 6.25.2 and Engineer has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Submittal or sample approval; nor will any approval by Engineer relieve Contractor from responsibility for errors or omissions in the Submittals or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28. Where a Submittal or sample is required by the Specifications, any related Work performed prior to Engineer's review and approval of the pertinent submission will be the sole expense and responsibility of Contractor.

Continuing the Work:

6.29. Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as Contractor and Owner may otherwise agree in writing.

Indemnification:

6.30. To the fullest extent permitted by Laws and Regulations Contractor shall indemnify and hold harmless Owner and Engineer and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

6.31. In any and all claims against Owner, or Engineer, or any of their consultants, agents or employees by any employee of Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any such Subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

6.32. The obligations of Contractor under paragraph 6.30 shall not extend to the liability of Engineer, Engineer's consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, design or specifications.

Coordination with Utilities.

6.33. The Contractor shall notify in writing responsible representatives of public utilities, railroads, or any other facilities or property that will be affected by his operations. Such notice shall be given in a timely manner before beginning work. The Contractor shall thereafter coordinate his work with the work necessary to protect or relocate such utilities, property or facilities, and cooperate to the fullest extent to avoid damage or service interruptions. Contractor shall keep Engineer informed of all such coordination and provide copies of written correspondence at time of notification. For obtaining underground utility locations, the

Contractor shall utilize the Kansas One-Call service, telephone no. 1-800-344-7233.

Public Convenience.

6.34. The Contractor shall notify owners of adjacent property and cooperate with them in the protection of their property. Engineer shall be informed of all actions and issued copies of any written correspondence with property owners. Access to driveways, houses and buildings, and temporary approaches and crossings of streets and sidewalks shall be provided, unless otherwise directed by the Engineer, and kept in good condition.

Traffic Control.

6.35. The Contractor shall comply with all pertinent requirements set forth in the drawing "Typical Traffic Control Through Construction Areas", of the Contract Documents, and as directed by the Engineer. The Contractor shall obtain approval of traffic control devices and methods from the County Engineer at least three (3) days prior to beginning work. All barricades, signs, lights and traffic control devices of any nature shall conform with current requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways."

Emergency Project Identification:

6.36. The Contractor, at the discretion of the Engineer, shall erect in a prominent place on the project a legible sign printed in letters and figures not less than three (3) inches high, showing the name of the Contractor, his County address, and the phone numbers of responsible personnel for day or night emergency contact.

Relations Between Contractor and Labor:

6.37. The Contractor and any Subcontractors shall take affirmative action to insure that employees are treated without regard to their race, religion, creed, color, sex, physical handicaps (which is unrelated to the ability to perform a particular job or occupation), national origin, ancestry or age. Such actions shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruiting or recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

Sanitary Conveniences:

6.39. The Contractor shall provide all necessary privy accommodations for the use of his employees and shall maintain the same in a clean and sanitary condition. He shall not create or permit any nuisance to the public or to residents in the vicinity of the work.

ARTICLE 7 - OTHER WORK

Related Work at Site:

7.1. Owner may perform other work related to the Project at the site by Owner's own forces, have other work performed by utility owners or let other direct contracts therefor which may contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Supplementary Conditions, written notice thereof will be given to Contractor prior to starting any such other work; and, if Contractor believes that such performance will involve additional expense to Contractor and the parties are unable to agree as to the extent thereof, Contractor may make a claim therefor as provided in Articles 11. If the Work of others is identified in the Supplementary Conditions or elsewhere in the Contract Documents, coordination with said Work shall be considered a requirement of this project and as such Contractor shall not be entitled to an adjustment in Price for coordination with the Work of others.

7.2. Contractor shall afford each utility owner and other Contractor who is a party to such a direct contract (or Owner, if Owner is performing the additional work with Owner's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected.

7.3. If any part of Contractor's Work depends for proper execution or results upon the work of any such other contractor or utility owner (or Owner), Contractor shall inspect and promptly report to Engineer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. Contractor's failure so to report will constitute an acceptance of the other work as fit and proper for integration with Contractor's Work except for latent or non-apparent defects and deficiencies in the other work.

Coordination:

7.4. If Owner contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither Owner nor Engineer shall have any authority or responsibility in respect of such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.1. Owner shall issue all communications to Contractor through Engineer.

8.2. In case of termination of the employment of Engineer, Owner shall appoint an engineer against whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.3. Owner shall furnish the data required of Owner under the Contract Documents promptly and shall make payments to Contractor promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1, 4.4 and 4.5. Paragraph 4.2 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by Design Engineer in preparing the Drawings and Specifications.

8.5. Owner is obligated to execute Change Orders as indicated in paragraph 10.4.

8.6. Owner's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.7. In connection with Owner's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with Owner's right to terminate services of Contractor under certain circumstances.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

Owner's Representative:

9.1. Engineer will be Owner's representative during the construction period. The Engineer for these purposes may be either the Design Engineer, County Engineer or Owner’s Project Representative as designated in the Agreement. The owner’s project representative may be a separate firm, other than the Design Engineer, retained by the Owner for the purpose of providing project representation during the construction period and not to ensure Contractor’s quality control and not as a substitute for Contractor’s obligation to deliver acceptable work. The duties and responsibilities and the limitations of authority of the Engineer, as Owner's Project Representative during construction, are set forth in the Contract Documents and shall not be extended without written consent of the Owner.

Visits to Site:

9.2. Engineer will determine, if the Work is proceeding in accordance with the Contract Documents. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform to the Contract Documents.

Project Representation:

9.3. Engineer will be responsible for observing the performance of the Work. The Engineer will be required to provide full-time observation of the Work. The Engineer or Owner's Project Representative's dealings in matters pertaining to the on-site Work shall in general be only with Contractor, and dealings with subcontractors shall only be through or with the full knowledge of Contractor. Written communication with Owner will be only through or as directed by Engineer.

9.3.1 The Engineer will:

(1) Serve as Owner's liaison with Contractor, working principally through Contractor's superintendent and assisting him in understanding the intent of the Contract Documents when Contractor's operations affect Owner's on-site operations.

(2) Assist in obtaining from Owner additional details or information, when required at the job site for proper execution of the Work.

(3) Conduct, for the sole benefit of the Owner, on-site observations, measurements and testing of the Work in progress to determine if the Work is proceeding in accordance with the Contract Documents and that completed Work will conform to the Contract Documents.

(4) Be responsible for the maintenance of record documents showing changes made during construction and recording items of work completed for the purpose of generating applications for progress payments and final payment in respect to Article 14, paragraphs 14.2 and 14.13.

9.3.2 The duties and responsibilities and the authority of the Engineer during construction shall not exceed in any case those of the Owner during construction. Except on written instructions by the Owner, the Engineer may not authorize any deviation from the Contract Documents or approve any substitute materials or equipment.

9.3.3. Specifically omitted from the Engineer's duties are any review of the Contractor's safety precautions, or the means, methods, sequences or procedures required for the Contractor to perform the work but not relating to the final or completed Project. Omitted design or review services include, but are not limited to, shoring, scaffolding, underpinning, temporary retainment, excavations, and any erection methods and temporary bracing.

Clarifications and Interpretations:

9.4. Engineer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as Engineer may determine necessary, which shall be consistent with or reasonably

inferable from the overall intent of the Contract Documents. If Contractor believes that a written clarification or interpretation justifies an increase in the Contract Price and the parties are unable to agree to the amount, Contractor may make a claim therefor as provided in Article 11.

Authorized Variations in Work:

9.5. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner, and also on Contractor who shall perform the Work involved promptly. A Field Order may authorize a change in the Work which results in a minor change in the quantity of specific unit price items included in the Agreement. If Contractor believes that a Field Order justifies an increase in the Contract Price, other than minor variations in quantities for Unit Price items and the parties are unable to agree as to the amount thereof, Contractor may make a claim therefor as provided in Article 11.

Rejecting Defective Work:

9.6. Engineer will have authority to disapprove or reject Work which Engineer believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

Submittals, Change Orders and Payments:

9.7. In connection with Engineer's responsibility for Submittals and samples, see paragraphs 6.23 through 6.28 inclusive.

9.8. In connection with Engineer's responsibilities as to Change Orders, see Articles 10 and 11.

9.9. In connection with Engineer's responsibilities in respect of Applications for Payment, etc., see Article 14.

Determinations of Quantities:

9.10. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Contractor will be provided the opportunity to jointly review quantity determinations and classifications of Unit Price Work prior to the preparation of a Pay Application. Contractor's failure to participate in the joint review will negate Contractor's right to appeal quantity determinations. Engineer's written decisions thereon will be final and binding upon Owner and Contractor as relates to progress and final payments.

Decisions on Disputes:

9.11. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 in respect of changes in the Contract Price will be referred initially to Engineer in writing with a request for a formal decision in accordance with this paragraph, which Engineer will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to Engineer and the other party to the Agreement promptly (but in no event later than fifteen days) after the occurrence of the event or after the end of the period of events giving rise thereto, and written supporting data will be submitted to Engineer and the other party within thirty days after such occurrence unless Engineer allows an additional period of time to ascertain more accurate data in support of the claim.

9.12. When functioning as interpreter and judge under paragraphs 9.10 and 9.11, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by Owner or Contractor of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on Engineer's Responsibilities:

9.13 Neither Engineer's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of Engineer to Contractor, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to described a requirement, direction, review or judgment of Engineer as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15. Engineer will not be responsible for Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and Engineer will not be responsible for Contractor's failure to perform or furnish the Work in

accordance with the Contract Documents.

9.16. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10 - CHANGES IN THE WORK

10.1. Without invalidating the Agreement and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Field Order (written or verbal where no change in contract price is involved), Work Change Directive, or Change Order. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

10.2. If Owner and Contractor are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price that should be allowed as a result of a Work Change Directive, a claim may be made therefor as provided in Article 11.

10.3. Contractor shall not be entitled to an increase in the Contract Price with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4. Owner and Contractor shall execute appropriate Change Orders covering:

10.4.1. Changes in the Work which are ordered by Owner pursuant to paragraph 10.1 (excluding Field Orders), are required because of acceptance of defective Work under paragraph 13.13 or correcting defective Work under paragraph 13.14, or are agreed to by the parties;

10.4.2. Changes in the Contract Price which are agreed to by the parties; and

10.4.3. Changes in the Contract Price which embody the substance of any written decision rendered by Engineer pursuant to paragraph 9.11; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.

10.5 If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be Contractor's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11 - CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at his expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to Engineer promptly (but in no event later than fifteen days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within thirty days after such occurrence (unless Engineer allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by Engineer in accordance with paragraph 9.11 if Owner and Contractor cannot otherwise agree on the amount involved. Failure to submit a claim for an adjustment in the Contract Price in accordance with this paragraph 11.2. will invalidate said claim.

11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1 through 11.9.3, inclusive).

11.3.2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2.1.)

11.3.3. On the basis of the cost of the Work or a Force Account (determined as provided in paragraphs 11.4 and 11.5) plus a Contractor's Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7)

Cost of the Work:

11.4. The term Cost of the work means the sum of all costs necessarily incurred and paid by Contractor in the proper performance of the Work. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5.

11.4.1. Payroll costs for employees in the direct employ of Contractor in the

performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, shall be included in the above to the extent authorized by Owner.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

11.4.3. Payments made by Contractor to the Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from Subcontractors acceptable to Contractor and shall deliver such bids to Owner who will then determine, with the advice of Engineer, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as Contractor's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

11.4.4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

11.4.5.2. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of Contractor.

11.4.5.3. All construction equipment and machinery and the parts thereof whether owned, leased or rented by the Contractor shall be compensated for at rental rates no higher than the monthly rate set forth in the Rental Rate Blue Book for Construction Equipment (Blue Book). The Blue Book rate is

calculated by dividing the monthly rate for the equipment by 176 and adjusting that rate by Blue Book age and regional adjustment factors before adding in Blue Book estimated hourly operating costs (the hourly operating costs includes costs for repair, fuel, and lubricants used or consumed). The use of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work. Equipment/machinery costs shall be apportioned to the actual time the equipment/machinery is in operation to perform the work. Down time or standby time shall not be charged to the Owner by the Contractor.

11.4.5.4. Any applicable taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

11.4.5.5. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.6. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.4.5.7. Cost of premiums for additional Bonds and insurance required because of changes in the Work.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnership and sole proprietorships), general manager, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks and other personnel employed by Contractor whether at the site or in Contractor's principal or a branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4 - all of which are to be considered administrative costs covered by the Contractor's Overhead and Fee.

11.5.2. Expenses of Contractor's principal and branch offices other than Contractor's office at the site.

11.5.3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

11.5.4. Cost of premiums for all Bonds and for all insurance whether or not Contractor is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by sub-paragraph 11.4.5.7 above).

11.5.5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or

equipment wrongly supplied and making good any damage to property.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

Contractor's Fee:

11.6. The Contractor's Fee allowed to Contractor for overhead and profit shall be determined as follows:

11.6.1. A mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. A fee based on the following percentages of the various portions of the cost of the Work:

11.6.2.1. For costs incurred under paragraphs 11.4.1 and 11.4.2, the Contractor's Fee shall be fifteen percent;

11.6.2.2. For costs incurred under paragraphs 11.4.3 and 11.4.4 the Contractor's Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a fee, the subcontractor fee for overhead and profit shall be fifteen percent;

11.6.2.3. No fee shall be payable on the basis of costs itemized under paragraph 11.4.5;

11.6.2.4. The amount of credit to be allowed by Contractor to Owner for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in Contractor's Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5. When both additions and credits are involved in any one change, the adjustment in Contractor's Fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.4, inclusive.

Force Account Work:

11.7. Whenever a change in the Work and Contract Price are authorized to be done on the basis of a Force Account, the cost of said Work shall be paid for pursuant to the requirements of paragraphs 11.4 through 11.6 and this paragraph 11.7. The Contractor and the Engineer shall compare and agree on proposed labor (by trades), materials and equipment to be incorporated in force account work prior to commencement of work. The Contractor and the Engineer shall compare and agree on all records for labor, material and equipment furnished on a daily basis. All applications for payment of Force Account Work shall be accompanied by fully documented and itemized breakdowns of all types of costs incurred together with supporting data. Supporting data shall include copies of all invoices for actual materials incorporated in the Work,

equipment rentals, subcontractor itemized invoices, etc.

Cash Allowances:

11.8. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to Engineer. Contractor agrees that:

11.8.1. The allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

11.8.2. Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

Unit Price Work:

11.9.1. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer in accordance with Paragraph 9.10.

11.9.2. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

11.9.3. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment if the total cost of a particular item of Unit Price Work amounts to five percent (5%) or more of the Contract Price based on the original bid and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than twenty percent (20%) from the bid quantity of such item indicated in the Agreement unless otherwise specified in the Supplementary Conditions. Contractor may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12 - CHANGE OF CALENDAR COMPLETION DATE

12.1 This is a Calendar Completion Date Contract, no extension of Completion Dates beyond those dates specified for Substantial Completion and ready for Final Acceptance and Payment as stated in Article 3 of the Agreement, shall be considered for reasons including, but not limited to, variations between actual and bid quantities, availability of materials and equipment, abnormal weather conditions, addition of extra work contiguous with the project and normal coordination with the work of others.

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee:

13.1. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to Contractor. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

13.2. Engineer and other representatives of Owner, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at all times for their observation, inspecting and testing. Contractor shall provide proper and safe conditions for such access.

Tests and Inspections:

13.3. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests or approvals.

13.4. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, Contractor shall assume full responsibility therefore, pay all costs in connection therewith and furnish Engineer the required certificates of inspection, testing or approval. Contractor shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with Owner's, or Engineer's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by Owner (unless otherwise specified).

13.5. All inspections, tests or approvals other than those required by Laws or Regulations of

any public body having jurisdiction shall be performed by organizations acceptable to Owner and Contractor (or by Engineer if so specified).

13.6. If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.7. Neither observations by Engineer nor inspections, tests or approvals by others shall relieve Contractor from Contractor's obligations to perform the Work in accordance with the Contract Documents.

Uncovering Work:

13.8. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

13.9. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose or otherwise make available for observation, inspection or testing as Engineer may require, that portion of the work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, Contractor shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and Owner shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, Owner may make a claim therefor as provided in Article 11. If, however, such Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and, if the parties are unable to agree as to the amount or extent thereof, Contractor may make a claim therefor as provided in Articles 11.

Owner May Stop the Work:

13.10. If the Work is defective, or Contractor fails to supply a supervisor or superintendent and sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor or any other party.

Correction or Removal of Defective Work:

13.11. If required by Engineer, Contractor shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been

rejected by Engineer, remove it from the site and replace it with non-defective Work. Contractor shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

One Year Correction Period:

13.12. If within one year after the date of Final Acceptance and Payment or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such defective Work, or, if it has been rejected by Owner, remove it from the site and replace it with non-defective work. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by Contractor. In special circumstances where a particular portion is placed in continuous service before Final Acceptance and Payment of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications. Contractor shall not be held liable for damage to work during the one year correction period resulting from normal wear and tear expected to occur from intended usage.

Acceptance of Defective Work:

13.13. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final acceptance and payment) prefers to accept it, Owner may do so. Contractor shall bear all direct, indirect and consequential costs attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to Engineer's recommendation of final acceptance and payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the contract Price, and, if the parties are unable to agree as to the amount thereof, Owner may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner or deducted from amounts owed to Contractor.

Owner May Correct Defective Work:

13.14. If Contractor fails within a reasonable time after written notice of Engineer to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with paragraph 13.11, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days' written notice to

Contractor, correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, Owner may exclude Contractor from all or part of the site, take possession of all or part of the Work, and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, agents and employees such access to the site as may be necessary to enable Owner to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of Owner in exercising such rights and remedies will be charged against Contractor in an amount approved as to reasonableness by Engineer, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, Owner may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of Contractor's defective Work.

Owner May Regulate Work:

13.15. The Owner shall have the authority to regulate the amount of work which may be open or under construction in advance of the completed portions of the Work. The sequence of construction shall be approved by the Engineer prior to construction if not specifically covered in the Contract Documents.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

Basis of Payment:

14.1. Progress payments for unit price contracts shall be based on the number of units completed. If a number of units are partially completed, the estimated percentage of the partially completed units times the number of units shall determine the completed units for that item. Lump sum items shall be paid based on the estimated percentage of completion at the end of each progress payment period.

Application for Progress Payment:

14.2 Engineer shall prepare and submit electronically to Contractor a Pdf file for review and signature an Application for Payment covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. All applications for payment shall include an updated and/or revised project schedule conforming to the requirements of paragraph 2.6.1. Contractor shall return a signed copy of the Application for Payment to the Engineer, in Pdf format, within seven (7) days following the end of the period covered by the Application for Payment. If payment covers materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be

accompanied by a bill of sale, invoice or other documentation and proof of payment for said materials warranting that Owner has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate Contractor furnished property insurance and/or other arrangements to protect Owner's interest therein, all of which will be satisfactory to Owner. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

Contractor's Warranty of Title:

14.3. Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner, no later than the time of payment, free and clear of all Liens.

Recommendation of Applications for Progress Payment:

14.4. Engineer will, within seven (7) days after receipt of a signed Application for Payment, accompanied by supporting documents and schedules, submit, in Pdf format, to Owner their recommendation of payment or return the Application to Contractor indicating in writing Engineer's reason for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application. Engineer will, within seven (7) days, review the resubmitted application as detailed above. Twenty Eight (28) days after presentation of the Application for Payment with Engineer's recommendation for approval, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by Owner to Contractor.

14.5. Engineer's recommendation of any Payment will constitute a representation by Engineer to Owner, based on Engineer's on-site observations of the Work in progress as an experienced and qualified professional that the Work has progressed to the point indicated; that, to the best of Engineer's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other qualifications stated in the recommendation); and that Contractor is entitled to payment of the amount recommended.

14.6. Engineer's recommendation of final acceptance and payment will constitute an additional representation by Engineer to Owner that the conditions precedent to Contractor's being entitled to final acceptance and payment as set forth in paragraph 14.13 have been fulfilled.

14.7. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make such representations to the Owner. Engineer may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

14.7.1. The Work is defective, or completed Work has been damaged requiring correction or replacement,

14.7.2. The Contract Price has been reduced by Change Order.

14.7.3. Owner has been required to correct defective Work or complete Work in accordance with paragraph 13.14, or

14.7.4. Of Engineer's actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

Owner may refuse to make payment of the full amount recommended by Engineer because claims have been made against Owner on account of Contractor's performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling Owner to a set-off against the amount recommended, but Owner must give Contractor immediate written notice stating the reasons for such action.

Substantial Completion:

14.8. When Contractor considers the entire Work ready for its intended use Contractor shall notify Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a notice of Substantial Completion. Within a reasonable time thereafter, Owner, Contractor and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor. If Engineer considers the Work substantially complete, Engineer will prepare and deliver to Owner and Contractor a notice of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a list of items "Punch List" to be completed or corrected before final payment. At the time of delivery of the notice of Substantial Completion Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final acceptance and payment between Owner and Contractor with respect to operation, safety, maintenance, insurance and warranties.

14.9. Owner shall have the right to exclude Contractor from the Work after the date of Substantial Completion, but Owner shall allow Contractor reasonable access to complete or correct items on the list.

Partial Utilization:

14.10 The Owner shall have the right to take possession of and use any finished part of the Works when it can be established by the Owner and Engineer that the part in question constitutes a separately functioning and usable part of the Work that can be used by Owner without significant interference with Contractor's performance of the remainder of the Work, subject to the following:

14.10.1 Owner at any time may request Contractor in writing to permit Owner to use any such part of the Work which Owner believes to be ready for its intended use and substantially complete. Contractor will certify to Owner and Engineer that said part of the Work is substantially complete. Engineer will then issue a notice of Substantial Completion for said part of the Work. The provisions of paragraphs 14.8 and 14.9 will apply with respect to said Substantial Completion and the division of responsibility in respect thereof and access thereto.

14.10.2. Owner may at any time notify Contractor in writing of Owner's intent to take over operation or use of any such part of the Work although it is not substantially complete. Engineer shall make an inspection of that part of the work to determine its status of completion and prepare a "Punch List" of items remaining to be completed or corrected thereon before final payment. Engineer shall submit said list together with a written recommendation as to the division of responsibilities pending final payment between Owner and Contractor with respect to operation, safety, maintenance, insurance, warranties and guarantees for that part of the Work which will become binding upon Owner and Contractor at the time when Owner takes over such operation or use. During such operation or use and prior to Substantial Completion of such part of the Work, Owner shall allow Contractor reasonable access to complete or correct items on said list and to complete other related Work.

Final Inspection:

14.11. Upon notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will make a final inspection with Owner and Contractor and will notify Contractor in writing of all "Punch List" particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to remedy such deficiencies.

Final Application for Payment:

14.12. After Contractor has completed all such corrections to the satisfaction of Engineer and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents - all as required by the Contract Documents, and after Engineer has indicated that the Work is acceptable (subject to the provisions of paragraph 14.16), Engineer shall prepare application for final payment following the procedure for progress payments. The Contractor shall sign and return final Application for Payment to Engineer. Final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to Owner) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by Owner, Contractor may furnish receipts or releases and receipts in full; an affidavit of Contractor that the releases include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible, have been paid or

otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, Contractor may furnish a Bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

Final Payment and Acceptance:

14.13. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract documents have been completed, Engineer shall prepare the final Application for Payment. Engineer shall submit final Application for Payment, with a request for all accompanying documentation as required by the Contract Documents, to the Contractor for review and signature. Contractor will, within seven (7) days after receipt of the final Application for Payment from the Engineer, return a signed copy of the final Application for Payment and accompanying documentation to the Engineer. Engineer will indicate in writing Engineer's recommendation for payment and present the Application to Owner for payment. Thereupon Engineer will give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of paragraph 14.16. Thirty (30) days after presentation to Owner of the application and accompanying documentation, in appropriate form and substance, and with Engineer's recommendation and notice of acceptability, the amount recommended by Engineer will become due and will be paid by Owner to Contractor.

14.14. If, through no fault of Contractor, final completion of the Work is significantly delayed and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment and recommendation of Engineer, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Contractor's Continuing Obligation:

14.15. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by Engineer to Owner, nor the notice of Substantial Completion, nor any payment by Owner to Contractor under the Contract Documents, nor any use or occupancy of the Work or any part thereof by Owner, nor any act of acceptance by Owner nor any failure to do so, nor any review and approval of a Submittal or sample submission, nor the issuance of a notice of acceptability by Engineer pursuant to paragraph 14.13, nor any correction of defective Work by Owner will constitute an acceptance of Work not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.16).

Waiver of Claims:

14.16. The making and acceptance of final payment will constitute:

14.16.1. A waiver of all claims by Owner against Contractor, except claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.11 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by Owner of any rights in respect of Contractor's continuing obligations under the contract Documents; and

14.16.2. A waiver of all claims by Contractor against Owner other than those previously made in writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

Owner May Suspend Work:

15.1. Owner may, at any time and without cause, suspend the work, or any portion thereof, for a period of not more than 120 days, by notice in writing to Contractor and Engineer. Contractor shall resume the Work on the date fixed by Owner by notice in writing to Contractor and Engineer. Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension by Owner without cause and in excess of 120 days if Contractor makes an approved claim therefor as provided in Articles 11 and 12.

Owner May Terminate:

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. If Contractor commences a voluntary case under any chapter of the bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

15.2.2. If a petition is filed against Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against Contractor under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3. If Contractor makes a general assignment for the benefit of creditors;

15.2.4. If a trustee, receiver, custodian or agent of Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of

property of Contractor is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of Contractor's creditors;

15.2.5. If Contractor admits in writing an inability to pay its debts generally as they become due;

15.2.6. If Contractor persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.6 as revised from time to time);

15.2.7. If Contractor disregards Laws or Regulations of any public body having jurisdiction;

15.2.8. If Contractor disregards the authority of Engineer; or

15.2.9. If Contractor otherwise violates in any substantial way any provisions of the Contract Documents; or

15.2.10. If Contractor fails to provide full time on-site project supervisor or superintendent.

Owner may, after giving Contractor (and the surety, if there be one) seven (7) days written notice and to the extent permitted by Laws and Regulations, terminate the services of Contractor, exclude Contractor from the site and take possession of the Work, incorporate in the Work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) such excess will be paid to Contractor. If such costs exceed such unpaid balance, Contractor shall pay the difference to Owner. Such costs incurred by Owner will be approved as to reasonableness by Engineer and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the Work performed.

15.3. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

15.4. Upon seven (7) days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, Contractor shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited

to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court costs).

Contractor May Stop Work or Terminate:

15.5. If, through no act or fault of Contractor, the Work is suspended for a period of more than 120 days by Owner or under an order of court or other public authority, or Engineer fails to act on any Application for Payment within forty-five (45) days after it has been signed and submitted, or Owner fails for forty-five (45) days after submittal of the application to pay Contractor any sum finally determined to be due provided that Contractor has complied with all appropriate requirements of these Contract Documents, then Contractor may, upon seven (7) days written notice to Owner and Engineer, terminate the Agreement and recover from Owner payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if Engineer has failed to forward to Owner a signed Application for Payment or Owner has failed to make any payment as aforesaid, Contractor may upon seven (7) days written notice to Owner and Engineer stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve Contractor of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with Owner.

ARTICLE 16 - MISCELLANEOUS

Giving Notice:

16.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by regular mail postage prepaid, to the last business address known to the giver of the notice.

General:

16.2. Should Owner or Contractor suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 16.2 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

16.3. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon Contractor by paragraphs 6.30, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to Owner and Engineer thereunder, are in addition to, and are not to be construed in any way as a limitation of, any

rights and remedies available to any or all of them which are otherwise imposed or available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

INDEX TO GENERAL CONDITIONS

Footnote: These General Conditions are based on the "Standard General Conditions of the Construction Contract", prepared by the Engineers Joint Contract Documents Committee, EJCDC No.1910-8 (1983 Edition). Deletions and additions have been made to the referenced document as deemed appropriate for use by Shawnee County, Kansas.

DOCUMENT 820
SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend, modify or supplement the General Conditions for Shawnee County Department of Public Works Construction Projects, Document 700, and other provisions of the Contract Documents, the Standard Technical Specifications or the Drawings, as indicated below. All provisions which are not so amended, modified or supplemented shall remain in full force and effect.

SC-1 SCHEDULE: The Contractor shall use the following dates in preparation of the Progress Schedule:

Description	Date / Time / Place
BIDS RECEIVED BIDS PUBLICALLY READ & RECORDED	Bids received until 2:00 PM Monday, August 28, 2023, through the Shawnee County bid portal, www.snco.us/purchasing. Bids from the portal will be publically read and recorded at 2:30 PM in the County Commission Chambers, 707 SE Quincy, 1st Floor.
Shawnee County Department of Public Works notifies successful bidder of County's intent to Award Contract. Included in notification will be three (3) unsigned counterparts of the Agreement and all other Contract Documents.	Tuesday, August 29, 2023
Contractor returns three (3) executed Agreements, Performance and Statutory Bonds and Insurance to Shawnee County Department of Public Works, 1515 NW Saline Street, Topeka, Kansas 66618 Attn: Michael Welch P.E.	Date: Thursday, September 7, 2023 Time: NOON Place: Shawnee County Public Works 1515 NW Saline Street, 2nd Floor Topeka, Kansas
Contract Award by Board of County Commissioners	Thursday, September 14, 2023
PRE-CONSTRUCTION CONFERENCE	Friday, September 15, 2023 @ 10:00 PM. Shawnee County Annex, 1515 NW Saline Street, Topeka, Kansas, 2nd Floor
CONSTRUCTION START WORK (Earliest Date)	Monday, September 18, 2023
CONSTRUCTION START WORK (Latest Date)	Friday, October 13, 2023
SUBSTANTIAL COMPLETION (Earliest Date)	Close of Business, Friday December 15, 2023
SUBSTANTIAL COMPLETION (Latest Date)	Close of Business, Wednesday January 10,2024
FINAL PAYMENT and ACCEPTANCE (Earliest Date)	Close of Business Friday, December 22, 2023
FINAL PAYMENT and ACCEPTANCE (Earliest Date)	Close of Business Wednesday January 17,2024

ISSUANCE OF START WORK ORDER;

The Start Work may be issued at the earliest on September 18, 2023. The Contractor may, at his option, delay the Start Work Order for the project until no later than October 13, 2023 and shall have 88 calendar days to reach Substantial Completion and have 7 calendar days after reaching Substantial Completion to reach Final Completion from the date he chooses to Start Work.

ALL materials, equipment and work provided for on this project shall be in accordance with current City of Topeka and Shawnee County Standard Technical Specifications and KDOT Standard Specifications for Road & Bridges, current edition and addenda thereto.

SC-2 SUBSTANTIALLY COMPLETE: For the work to be considered Substantially Complete, all work except Seeding, Fertilizing and Mulching shall be complete and accepted and the roadway opened to unrestricted traffic.

After the Substantial Completion time period, the Contractor shall complete the Seeding items of work. The Contractor shall be responsible for all Traffic Control, including flaggers during such time traffic on the roadway is limited. Traffic control shall be in accordance with the latest edition of the "Uniform Traffic Control Manual".

SC-3 MATERIAL INSPECTION: Prior to placing orders with any material supplier or fabricator, the Contractor shall notify the supplier or fabricator in writing, with a copy to the Engineer, that the "BASIS OF ACCEPTANCE" for that material shall be as stated in SPECIAL PROVISION, SECTION 2600, MATERIALS CERTIFICATION. The Engineer reserves the right to reject any materials not conforming to the material specifications or requirements of the specifications at the project site.

SC-4 BID ITEMS: The following bid items shall be completed according to the Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation, Edition of 2015, or as amended by the Project Special Provisions:

Removal of Existing Structures
Mobilization
Object Marker (Type 3)
Soil Erosion Mix
Erosion Control (Type I, Class C)
Biodegradable Log (20")
Filter Sock (18")
Class III Excavation
Concrete Grade 4.0 (AE)
Reinforcing Steel (Gr. 60)
Foundation Stabilization
Geotextile (Erosion Control)

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 402 and replace with the following:

SECTION 402

STRUCTURAL CONCRETE

402.1 DESCRIPTION

Provide the grades of concrete specified in the Contract Documents.

This specification is specific to Structural Concrete. See **SECTION 401** for general concrete requirements.

402.2 MATERIALS

Provide materials that comply with the applicable requirements.

General Concrete..... **SECTION 401**
Aggregate..... **DIVISION 1100**
Admixtures, and Plasticizers ..... **DIVISION 1400**
Cement, Fly Ash, Silica Fume, Slag Cement and Blended Supplemental Cementitious..... **DIVISION 2000**
Water ..... **DIVISION 2400**

402.3 CONCRETE MIX DESIGN

a. General. Design structural concrete mixes as specified in the Contract Documents.

b. Concrete Mix Design. Two options are available for mix design procedures. Use the procedures outlined in **SECTION 401** to design structural concrete mixes.

c. Concrete Strength Requirements. Design concrete to meet the strength requirements of **SECTION 401**.

d. Portland Cement, Blended Hydraulic Cement, and Individual and Blended Supplemental Cementitious Materials. Unless specified otherwise in the Contract Documents, select the type of portland cement, blended hydraulic cement and individual and blended supplemental cementitious materials according to **SECTION 401**.

e. Structural Concrete Specific Requirements. Design concrete to meet the following requirements:

(1) Maximum water to cementitious ratio of 0.45 and a minimum cementitious content of 480 lbs per cubic yard.

(2) Air entrained concrete with a target air content of 6.5 ± 1.5 percent as specified in **subsection 401.3i**.

(3) Determine the air loss due to pumping operations once in the AM and once in the PM. Determine the difference between the air content from concrete sampled before the pump, and concrete sampled after pumping. Make adjustment to the mix to compensate for the pumping of the concrete.

(4) Concrete permeability requirements according to **TABLE 402-1**.

TABLE 402-1: REQUIREMENTS FOR STRUCTURAL CONCRETE			
	Volume of Permeable Voids, maximum	**Surface Resistivity, minimum**	**Rapid Chloride Permeability, maximum**
Use Low Permeability Concrete (LPC) for Bridge Overlays	9.5%	27.0 kΩ-cm	1000 Coulombs
Use Moderate Permeability Concrete (MPC) for specified Full Depth Bridge Decks.	11.0%	13.0 kΩ-cm	2000 Coulombs
Use Standard Permeability Concrete (SPC) for all other structural concrete not specified as Low or Moderate Permeability.	12.5%	9.0 kΩ-cm	3000 Coulombs

(5) Test data from KT-73 tested at 28 days, KT-79 tested at 28 days, or AASHTO T-277 tested at 56 days. Provide test results on a minimum of 1 set of 3 cylinders for each mix, tested at the highest water to cementitious ratio that meets **subsections 401.3e.** and **401.3i**. Submit accelerated cure procedures for the Engineer's approval. The use of supplemental cementitious materials may be necessary to meet permeability requirements. See **SECTION 401**.

(6) Use Quality Requirements for Structural Aggregates as listed in **SECTION 1102**, Aggregates For Concrete Not Placed on Grade.

(7) Use gradation requirements for aggregates as listed in **SECTION 1102**, Aggregates For Concrete Not Placed on Grade.

(8) Use MA-6 optimized gradation for Low Permeability Concrete for Bridge Overlays.

(9) ASTM C-1567 may be required if supplementary cementitious materials (SCMs) other than silica fume are utilized. See **subsection 401.3j.** for requirements.

f. Slump.

(1) Designate a slump for each concrete mix design that is required for satisfactory placement of the concrete application. Reject concrete with a slump that limits the workability or placement of the concrete.

(2) If the designated slump is 3 inches or less, the tolerance is ±3/4 inch, or limited by the maximum allowable slump for the individual type of construction.

(3) If the designated slump is greater than 3 inches the tolerance is ±25% of the designated slump.

(4) For drilled shafts the target slump just prior to being pumped into the drilled shaft is 9 inches. If the slump is less than 8 inches, redose the concrete with admixtures as permitted in **subsection 401.3k**.

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KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 401 and replace with the following:

SECTION 401

GENERAL CONCRETE

401.1 DESCRIPTION

Provide the grades of concrete specified in the Contract Documents.
See **SECTION 402** for specific requirements for Structural Concrete.
See **SECTION 403** for specific requirements for On Grade Concrete.
See **SECTION 404** for specific requirements for Prestressed Concrete.

401.2 MATERIALS

Provide materials that comply with the applicable requirements.

Aggregate ..... **DIVISION 1100**
Admixtures and Plasticizers ..... **DIVISION 1400**
Grade 2 Calcium Chloride..... **DIVISION 1700**
Cement, Fly Ash, Silica Fume, Slag Cement and Blended Supplemental Cementitious..... **DIVISION 2000**
Water ..... **DIVISION 2400**

401.3 CONCRETE MIX DESIGN

a. General. Design the concrete mixes specified in the Contract Documents.

Do not place any concrete on the project until the Engineer approves the concrete mix designs. Once the Engineer approves the concrete mix design, do not make changes without the Engineer's approval.

Take full responsibility for the actual proportions of the concrete mix, even if the Engineer assists in the design of the concrete mix.

Provide aggregate gradations that comply with **DIVISION 1100** and Contract Documents.

Admixture dosage rate requirements for mix design approval and field production are provided in **subsection 401.3k**.

If desired, contact the DME for available information to help determine approximate proportions to produce concrete having the required characteristics on the project.

Submit all concrete mix designs to the Engineer for review and approval. Submit completed volumetric mix designs on KDOT Form No. 694 and all required attachments at least 60 days prior to placement of concrete on the project. The Engineer will provide an initial review of the design within 5 business days following submittal.

Include the following information:

(1) Test data from KT-73 tested at 28 days, KT-79 tested at 28 days or AASHTO T-277 tested at 56 days. Provide test results on a minimum of 1 set of 3 cylinders for each mix, tested at the highest water to cementitious material ratio that meets **subsection 401.3h**. Submit accelerated cure procedures for the Engineer's approval.

(2) Test data from ASTM C1567 for blended cements meeting **subsection 401.3j.** for all concrete utilizing all actual materials proposed for use on the project at designated percentages.

(3) Single point grading for the combined aggregates along with a plus/minus tolerance for each sieve. Use plus/minus tolerances to perform quality control checks and by the Engineer to perform aggregate grading verification testing. The tests may be performed on the combined materials or on individual aggregates, and then theoretically combined to determine compliance.

(4) Laboratory 28-day compressive strength test results on a minimum of 1 set of 3 cylinders produced from the mix design with the highest water to cementitious ratio for the project, utilizing all actual materials

proposed for use on the project at designated percentages. The average compressive strength shall exceed the strength requirements for the Grade specified in the Contract Documents as determined by **subsection 401.3b**. Perform compressive strength tests according to KT-76.

(5) Historical mix production data for the plant producing concrete for the project to substantiate the standard deviation selected for use in **subsection 401.3b.**, if applicable.

(6) Necessary materials to enable the Engineer to test the mix properties, if applicable.

(7) Batching sequence. Consider the location of the concrete plant in relation to the job site, and identify when and at what location the water reducer or plasticizer is added to the concrete mixture.

Submit complete mix design data including proportions and sources of all mix ingredients, and the results of strength and permeability tests representing the mixes proposed for use. The data may come from previous KDOT project records or a laboratory regularly inspected by Cement and Concrete Reference Laboratory (CCRL). Data from other sources will only be accepted if testing was conducted or witnessed by personnel certified in Hardened Concrete Properties (HCP) according to the Policy and Procedures Manual for The Certified Inspection and Testing (CIT) Training Program.

After initial review, the Engineer will perform any testing necessary to verify the design. This may include a 3-cubic yard test batch at the producing plant. Do not make changes to the Approved Concrete Mix Design without the Engineer's approval. Limited adjustments may be made to admixture dosages and aggregate proportions in accordance with **subsection 401.3i.** and **subsection 403.4e**. These adjustments must be recorded and submitted to the Engineer.

Mix designs will remain approved when verification testing for strength and permeability conducted within the last 12 months indicate continued compliance with the specifications and percentages of constituents including aggregate and cementitious materials and product, type and supplier of admixtures remain the same. Test results on the same mix from other sources are acceptable.

Improvements in concrete strength, workability, durability and permeability are possible if the combined aggregate grading is optimized. Procedures found in ACI 302.1 or other mix design techniques, approved by the Engineer, are acceptable in optimizing the mix design.

Delay the commencement of tests for temperature, slump, and air content and molding of field cylinders from 4 to 4½ minutes after the sample has been taken from a continuous mixer. If a batch type mixer is used, take the tests at the point of placement and begin testing immediately.

b. Required Compressive Strength for Concrete Mix Design. The required compressive strength for mix design approval shall be based on previous data from similar mix designs or according to **subsection 401.1b.(2)**.

(1) Concrete Mix Design Based on Previous Data. Provide concrete mix designs based on previous 28-day compressive strength test data from similar concrete mixtures. Similar mixtures are within 1000 psi of the specified 28-day compressive strength, and are produced with the same type and sources of cementitious materials, admixtures and aggregates.

Consider sand sources the same, provided they are not more than 25 miles apart on the same river and no tributaries enter the river between the 2 points. Consider crushed locations similar if they are mined in one continuous operation, and there is no significant change in geology. Mixes that have changes of more than 10% in proportions of cementitious materials, aggregates or water content are not considered similar.

Air entrained mixes are not considered similar to non-air entrained mixes.

Mixes tested with admixtures are not the same as mixes tested without those admixtures.

Test data should represent at least 30 separate batches of the mix. One set of data is the average of at least 2 cylinders from the batch. The data shall represent a minimum of 45 days of production within the past 12 months.

Do not include data over 1 year old. When fewer than 30 data sets are available, the standard deviation of the data must be corrected to compensate for the fewer data points.

Provide a 4000 psi concrete with a $f'cr$ greater than or equal to 5200 psi. Otherwise provide a concrete mix design that will permit no more than 5% of the 28-day compressive strength tests to fall below the specified 28-day compressive strength ($f'c$) based on equation A, and no more than 1% of the 28-day compressive strength tests to fall below the specified 28-day compressive strength ($f'c$) by more than 500 psi based on equation B.

Equation A: $f'cr = f'c + 1.62 * k * s$

Equation B: $f'cr = (f'c - 500) + 2.24 * k * s$

Where: $f'cr$ = average 28-day compressive strength required to meet the above criteria.
$f'c$ = specified 28-day compressive strength
s = standard deviation of test data
k = constant based on number of data points
n = number of data points
$k = 1.3 - n / 100$, where $15 < n < 30$
$k = 1$, where $n > 30$

Provide a concrete mix design that has an average compressive strength that is equal to the larger of Equation A or Equation B. Submit all supporting test data with the mix design.

(2) All Other Concrete Mix Designs. For concrete mixes that have fewer than 15 data points, or if no statistical data is available, use Equations A and B to calculate $f'cr$ using the following values.

s = 20% of the specified 28-day compressive strength ($f'c$)
$k = 1$

c. Portland Cement and Blended Hydraulic Cement. Unless specified otherwise in the Contract Documents, select the type of portland cement or blended hydraulic cement according to **TABLE 401-1**.

TABLE 401-1: PORTLAND CEMENT & BLENDED HYDRAULIC CEMENT

Concrete for:	**Type of Cement Allowed**
On Grade Concrete	Type IP(x) Portland-Pozzolan Cement Type IS(x) Portland- Slag Cement Type IT(Ax)(By) Ternary Blended Cement Type IL(x) Portland-Limestone Cement[1] Type II Portland Cement
All Concrete other than On Grade Concrete.	Type I Portland Cement Type IP(x) Portland-Pozzolan Cement Type IS(x) Portland- Slag Cement Type IT(Ax)(By) Ternary Blended Cement Type IL(x) Portland Limestone Cement[1] Type II Portland Cement
High Early Strength Concrete	Type III Portland Cement Type I, IP(x), IS(x), IT(Ax)(By), Type IL(x)[1] or II Cement may be used if strength and time requirements are met.

Note 1 – Type IL(x) Portland Limestone Cement will have between 5-15% limestone content produced by intergrinding, blending, or a combination of intergrinding and blending at the Cement Manufacturer's facility.

d. Blended Cement Concrete. When approved by the Engineer, the concrete mix design may include SCMs such as fly ash, slag cement, silica fume or blended SCM from an approved source as a partial replacement for portland cement or blended hydraulic cement except where controlled in **SECTIONS 402, 403** or **404**. Obtain the Engineer's approval before substituting SCMs for Type III cement. Changes in SCM or cement will require a new mix design approval.

(1) Cements meeting **SECTION 2001** are not field blended cements.

(2) Cements with SCMs added at the concrete mixing plant are field blended cements.

(3) Supplementary materials can be combined with cement to create field blended cements. Do not exceed allowable substitution rates noted in **TABLE 401-2**. Substitute 1 pound of SCM for 1 pound of cement. Limestone used in Type 1L cements is not an SCM and cannot be field blended.

(4) SCMs in prequalified cements are to be included in the total combined substitution rate.

TABLE 401-2: ALLOWABLE SUBSTITUTION RATE FOR SUPPLEMENTARY CEMENTITIOUS MATERIAL.	
Material	**Substitution Rate***
Slag Cement	40% Maximum
Fly Ash	25% Maximum
Blended SCM	25% Maximum
Silica Fume	5% Max
Total Combined	50%

* Total Substitution Rate includes material in preblended cements and blended SCMs.

(5) When used, add silica fume with other cementitious materials during batching procedures. If the silica fume cannot be added to the cementitious materials, add the loose silica fume to the bottom of the stationary drum that is wet, but has no standing water, before adding the dry materials. The Engineer may approve shreddable bags on a performance basis, only when a central batch mixing process is used. If so, add the bags to half of the mixing water and mix before adding cementitious materials, aggregate and remainder of water.

Mix silica fume modified concrete for a minimum of 100 mixing revolutions.

e. Strength. Design concrete to meet **TABLE 401-3**.

TABLE 401-3: CONCRETE STRENGTH REQUIREMENTS	
Specified 28 Day Compressive Strengths, minimum, psi *f'c*	
Grade of Concrete:	**Non Air Entrained/Air Entrained Concrete**
Grade 7.0	7,000
Grade 6.0	6,000
Grade 5.0	5,000
Grade 4.5	4,500
Grade 4.0	4,000
Grade 3.5	3,500
Grade 3.0	3,000
Grade 2.5	2,500

f. High Early Strength Concrete (HESC). Design the high early strength concrete mix to comply with strength and time requirements specified in the Contract Documents.

Unless otherwise specified, design high early strength concrete for pavement at a minimum of 1 of the Contractor's standard deviations above 2400 psi (cylinders) at 24 hours. If no statistics are available, design a HESC with a compressive strength greater or equal to 2880 psi.

Submit complete mix design data including proportions and sources of all mix ingredients, and the results of time and strength tests representing the mixes proposed for use. The strength and time data may come from previous KDOT project records or from an independent laboratory, and shall equal or exceed the strength and time requirements listed in the Contract Documents.

g. Slump. Designate a slump for each concrete mix design that is required for satisfactory placement of the concrete application not to exceed 5 inches except where controlled by maximum allowable slumps stated in **SECTIONS 402, 403** and **404**. Reject concrete with a slump that limits the workability or placement of the concrete.

h. Permeability. Supply concrete meeting the permeability requirements specified in **SECTION 402** for structural concrete and **SECTION 403** for on grade concrete. Permeability testing from KT-73 tested at 28 days, KT-79 tested at 28 days **or** AASHTO T-277 tested at 56 days is required for all bridge overlays, Moderate Permeability Concrete, and any project with over 250 cubic yards of concrete (this includes structural concrete, on

grade concrete etc.). The field verification test procedure must be the same test procedure as the mix design approval test.

There are no permeability requirements for concrete for prestressed concrete members as specified in **SECTION 404**.

i. Air Content. Determine air content by KT-18 (Pressure Method) or KT-19 (Volumetric Method). With the exception of concrete for pavement as shown in **SECTION 403**, use the middle of the specified air content range of 6.5 ± 1.5% for the design of air entrained concrete. Maximum air content is 10%. Take immediate steps to reduce the air content whenever the air content exceeds 8%.

j. Alkali Silica Reactivity. If the concrete mix design includes supplemental cementitious materials (SCMs), provide mortar expansion test results from ASTM C1567 as part of mix design approval unless meeting the minimum requirements shown in **TABLE 401-4**. Use the project's mix design concrete materials at their designated percentages. Provide a mix with a maximum expansion of 0.10% at 16 days after casting. Provide ASTM C1567 results on an annual basis.

TABLE 401-4: MINIMUM SCM CONTENT REQUIRED TO WAIVE ASTM C1567 TESTING

Type of Coarse Aggregate Sweetener (refer to TABLE 1102-2 or TABLE 1116-1)	Are the Fine and Intermediate (if used) Aggregate Sources on PQL 3.1?	Proportion Required by Percent Weight of Total Cementitious Material			
		Slag Cement	Class C Fly Ash	Class F Fly Ash	Silica Fume
Crushed Sandstone, Crushed Limestone, Crushed Dolomite, or Siliceous Aggregate on PQL 3.1	No	ASTM C1567 Testing Required		25%	Any*
Any combination of Crushed Limestone, Crushed Dolomite, Crushed Sandstone, and Siliceous Aggregate on PQL 3.1	Yes	Any*	15%	Any*	Any*

*Subject to the maximum allowable percentages in **TABLE 401-2**.

ASTM C1567 Testing can be waived for ternary (3 cementitious materials) mix designs with approval of the KDOT Bureau of Research.

k. Admixtures for Acceleration, Air-Entraining, Plasticizing, Set Retardation and Water Reduction. Verify that the admixtures used are compatible and will work as intended without detrimental effects. Use the dosages recommended by the admixture manufacturers. Incorporate and mix the admixtures into concrete mixtures according to the manufacturer's recommendations. Determine the quantity of each admixture for the concrete mix design.

(1) Accelerating Admixture. When specified in the Contract Documents, or in situations that involve contact with reinforcing steel and require early strength development to expedite opening to traffic, a non-chloride accelerator may be approved. The Engineer may approve the use of a Type C or E accelerating admixture. A Grade 2 calcium chloride accelerator may be used when patching an existing pavement more than 10 years old.

Add the calcium chloride by solution (the solution is considered part of the mixing water).

- For a minimum cure of 4 hours at 60°F or above, use 2% (by dry weight of cement) calcium chloride.
- For a minimum cure of 6 hours at 60°F or above, use 1% (by dry weight of cement) calcium chloride.

(2) Air-Entraining Admixture. When specified, use an air-entraining admixture in the concrete mixture. If another admixture is added to an air-entrained concrete mixture, determine if it is necessary to adjust the air-entraining admixture dosage to maintain the specified air content.

(3) Water-Reducers and Set-Retarders. A water-reducing admixture for improving workability may be required. If unfavorable weather or other conditions adversely affect the placing and finishing properties of the

concrete mix, the Engineer may allow the use of water-reducers and set-retarders. Verify that the admixtures will work as intended without detrimental effects. If the Engineer approves the use of water-reducers and set-retarders, their continued use depends on their performance.

(4) Plasticizer Admixture. A plasticizer is defined as an admixture that produces flowing concrete, without further addition of water, and/or retards the setting of concrete. Flowing concrete is defined as having a slump equal to or greater than 7 ½ inches while maintaining a cohesive nature.

Manufacturers of plasticizers may recommend mixing revolutions beyond the limits specified in **subsection 401.8**. If necessary, address the additional mixing revolutions in the concrete mix design. The Engineer may allow up to 60 additional revolutions when plasticizers are designated in the mix design.

Before the concrete mixture with a slump equal to or greater than 7 ½ inches is used on the project, conduct tests on at least 1 full trial batch of the concrete mix design in the presence of the Engineer to determine the adequacy of the dosage and the batching sequence of the plasticizer to obtain the desired properties. Determine the air content of the trial batch both before and after the addition of the plasticizer. Monitor the slump, air content, temperature and workability at regular intervals of the time period from when the plasticizer is added until the estimated time of completed placement. At the discretion of the Engineer, if all the properties of the trial batch remain within the specified limits, the trial batch may be used in the project.

Do not add water after plasticizer is added to the concrete mixture.

(5) Field Adjustment to Admixtures. Limited adjustments to the dosage rate of accelerators, set-retarders, water reducers, and air-entraining admixtures are permitted to compensate for environmental changes during placement without a new concrete mix design or trial batch. Test the concrete for temperature, air content, and slump whenever changes are made to the dosage rates to ensure continued compliance with the specifications. The allowable adjustments are based on the dose used in the Approved Concrete Mix Design and according to the following:

- Do not exceed the accelerator dosage used in the Approved Concrete Mix Design. The accelerator dosage may be reduced or eliminated as needed. Redosing accelerators is not permitted.
- The water reducer dosage used in the Approved Concrete Mix Design sets the minimum permitted dose for use in the field. The water reducer dose may be increased from that shown in the Approved Concrete Mix Design provided that the slump does not to exceed the maximum designated slump. Slump reduction may be obtained by withholding a portion of the mix water as specified in **subsection 401.8a**.
- Redosing of water reducers and air-entraining admixtures is permitted to control slump or air content in the field, when approved by the Engineer, time and temperature limits are not exceeded, and at least 30 mixing revolutions remain before redosing. Redose according to manufacturer's recommendations.
- Set retarders may be added as needed during production. Do not include set retarders in the Concrete submitted for Mix Design Approval. Redosing retarders is not permitted. Paperwork for submitted mix designs (Form 694) with no (zero) water reducer and/or set retarder in the original Concrete submitted for Mix Design Approval must show the manufacturer of the admixtures that may be included in the Project Concrete.

401.4 REQUIREMENTS FOR COMBINED MATERIALS

a. Measurements for Proportioning Materials.

(1) Cement. Measure cement as packed by the manufacturer. A sack of cement is considered as 0.04 cubic yards weighing 94 pounds net. Measure bulk cement by weight. In either case, the measurement must be accurate to within 0.5% throughout the range of use.

(2) Supplemental Cementitious Materials. Supplemental cementitious materials proportioning and batching equipment is subject to the same controls as required for cement. Provide positive cut off with no leakage from the cut off valve. Cementitious materials may be weighed accumulatively with the cement or separately. If weighed accumulatively, weigh the cement first.

(3) Water. Measure the mixing water by weight or by volume accurate to within 1% throughout the range of use.

(4) Aggregates. Measure the aggregates by weight, accurate to within 0.5% throughout the range of use.

(5) Admixtures. Measure liquid admixtures by weight or volume, accurate to within 3% of the quantity required. If liquid admixtures are used in small quantities in proportion to the cement as in the case of air-entraining agents, use readily adjustable mechanical dispensing equipment capable of being set to deliver the required quantity and to cut off the flow automatically when this quantity is discharged.

b. Testing of Aggregates.

(1) Production of On Grade Concrete Aggregate (OGCA). If OGCA is required, notify the Engineer in writing at least 2 weeks in advance of producing the aggregate. Include the source of the aggregate and the date production will begin. Failure to notify the Engineer, as required, may result in rejection of the aggregate for use as OGCA. Maintain separate stockpiles for OGCA at the quarry and at the batch site and identify them accordingly.

(2) Testing Aggregates at the Batch Site. Provide the Engineer with reasonable facilities at the batch site for obtaining samples of the aggregates. Provide adequate and safe laboratory facilities at the batch site allowing the Engineer to test the aggregates for compliance with the specified requirements.

KDOT will sample and test aggregates from each source to determine their compliance with specifications. Do not batch the concrete mixture until the Engineer has determined that the aggregates comply with the specifications. KDOT will conduct sampling at the batching site, and test samples according to the Sampling and Testing Frequency Chart in Part V. For QC/QA contracts, establish testing intervals within the specified minimum frequency.

After initial testing is complete, and the Engineer has determined that the aggregate process control is satisfactory, use the aggregates concurrently with sampling and testing as long as tests verify compliance with specifications. When batching, sample the aggregates as near the point of batching as feasible. Sample from the stream as the storage bins or weigh hoppers are loaded. If samples cannot be taken from the stream, take them from approved stockpiles, or use a template and sample from the conveyor belt. If test results indicate an aggregate does not comply with specifications, cease concrete production using that aggregate. Unless a tested and approved stockpile for that aggregate is available at the batch plant, do not use any additional aggregate from that source and specified grading until subsequent testing of that aggregate indicate compliance with specifications. When tests are completed and the Engineer is satisfied that process control is satisfactory, production of concrete using aggregates tested concurrently with production may resume.

c. Handling of Materials.

(1) Approved stockpiles are permitted only at the batch plant and only for small concrete placements or for maintaining concrete production. Mark the approved stockpile with an "Approved Materials" sign. Provide a suitable stockpile area at the batch plant so that aggregates are stored without detrimental segregation or contamination. At the plant, limit stockpiles of tested and approved coarse, fine and intermediate aggregate to 250 tons each, unless approved for more by the Engineer. If mixed aggregate is used, limit the approved stockpile to 500 tons, the size of each being proportional to the amount of each aggregate to be used in the mix.

Load aggregates into the mixer such that no material foreign to the concrete or material capable of changing the desired proportions is included.

(2) Segregation. Do not use segregated aggregates. Previously segregated materials may be thoroughly re-mixed and used when representative samples taken anywhere in the stockpile indicated a uniform gradation exists.

(3) Cement and Supplemental Cementitious. Protect cement and supplemental cementitious materials in storage or stockpiled on the site from any damage by climatic conditions which would change the characteristics or usability of the material.

(4) Moisture. Provide aggregate with a moisture content of ±0.5% from the average of that day. If the moisture content in the aggregate varies by more than the above tolerance, take whatever corrective measures are necessary to bring the moisture to a constant and uniform consistency before placing concrete. This may be accomplished by handling or manipulating the stockpiles to reduce the moisture content, or by adding moisture to the stockpiles in a manner producing uniform moisture content through all portions of the stockpile.

Handheld moisture-determining devices are permitted. For plants equipped with an approved accurate moisture-determining device capable of continuously determining the free moisture in the aggregates, and provisions made for batch-to-batch correction of the amount of water and the weight of aggregates added, the requirements relative to manipulating the stockpiles for moisture control will be waived. Approval and accuracy of the moisture-determining device is based on daily comparisons with KT-24 or ASTM C566 and at the discretion of the Engineer. Any procedure used will not relieve the producer of the responsibility for delivering concrete of uniform slump within the limits specified.

(5) Separation of Materials in Tested and Approved Stockpiles. Only use KDOT Approved Materials. Provide separate means for storing materials approved by KDOT. If the producer elects to use KDOT Approved Materials for non-KDOT work, during the progress of a project requiring KDOT Approved Materials, inform the Engineer and agree to pay all costs for additional material testing.

Clean all conveyors, bins and hoppers of any unapproved materials before beginning the manufacture of concrete for KDOT work.

401.5 MORTAR AND GROUT

a. General. Follow the proportioning requirements in **subsections 401.5b.** and **c.** for mortar and grout unless otherwise specified in the Contract Documents, including altering the proportions when a minimum strength is specified.

b. Mortar. Mortar is defined as a mixture of cementitious materials, FA-M aggregate and water, which may contain admixtures, and is typically used to minimize erosion between large stones or to bond masonry units.

Proportion mortar for laying stone for stone rip-rap, slope protection, stone ditch lining or pavement patching at 1 part of portland cement and 3 parts of FA-M aggregate by volume with sufficient water to make a workable and plastic mix.

Proportion mortar for laying brick, concrete blocks or stone masonry at ½ part masonry cement, ½ part portland cement and 3 parts FA-M aggregate, either commercially produced masonry sand or FA-M, by volume with sufficient water to make a workable and plastic mix.

Do not use air-entraining agents in mortar for masonry work.

The Engineer may visually accept the sand used for mortar. The Engineer may visually accept any recognized brand of portland cement or masonry cement that is free of lumps.

c. Grout. Grout is defined as a mixture of cementitious materials with or without aggregate or admixtures to which sufficient water is added to produce a pouring or pumping consistency without segregation of the constituent materials and meeting the applicable specifications.

401.6 COMMERCIAL GRADE CONCRETE

If the Contract Documents allow the use of commercial grade concrete for designated items, then use a commercial grade mixture from a ready mix plant approved by the Engineer.

The Engineer must approve the commercial grade concrete mixture. Approval of the commercial grade mixture is based on these conditions:

- All materials are those normally used for the production and sale of concrete in the vicinity of the project.
- The mixture produced is that normally used for the production and sale of concrete in the vicinity of the project.
- The mixture produced contains a minimum cementitious content of 6 sacks (564 lbs) of cementitious material per cubic yard of concrete.
- The water-cementitious ratio is as designated by the Engineer. The maximum water-cementitious ratio permitted may not exceed 0.50 pounds of water per pound of cementitious material including free water in the aggregate.
- Type I, II, III, IP, IS, 1L or IT cement may be used unless otherwise designated. Fly ash, slag cement and blended supplemental materials may be substituted for the required minimum cement content as specified in **subsection 401.3**. No additives other than air entraining agent will be allowed. The Contractor will not be required to furnish the results of strength tests when submitting mix design data to the Engineer.
- In lieu of the above, approved mix designs (including optimized) for all other grades of concrete, Grade 3.0 or above, are allowable for use as commercial grade concrete, at no additional cost to KDOT.

Exercise good engineering judgment in determining what equipment is used in proportioning, mixing, transporting, placing, consolidating and finishing the concrete.

Construct the items with the best current industry practices and techniques.

Before unloading at the site, provide a delivery ticket for each load of concrete containing the following information:

- Name and location of the plant.
- Time of batching concrete.
- Mix proportions of concrete (or a mix designation approved by the Engineer).
- Number of cubic yards of concrete batched.

Cure the various items placed, as shown in **DIVISION 700**.

The Engineer may test commercial grade concrete by molding sets of 3 cylinders. This is for informational purposes only. No slump or unit weight tests are required.

401.7 CERTIFIED CONCRETE

If KDOT inspection forces are not available on a temporary basis, the Engineer may authorize the use of concrete from approved concrete plants. Approval for this operation is based on certification of the plant and plant personnel, according to KDOT standards. KDOT's approval may be withdrawn any time that certification procedures are not followed. Contact the DME for additional information.

The Engineer will not authorize the use of certified concrete for major structures such as bridges, RCB box bridges, RCB culverts, permanent main line and ramp pavement or other structurally, critical items.

Each load of certified concrete must be accompanied by a ticket listing mix proportions, time of batching and setting on revolution counter, total mixing revolutions and must be signed by certified plant personnel.

401.8 MIXING, DELIVERY AND PLACEMENT LIMITATIONS

a. Concrete Batching, Mixing and Delivery. Batch and mix the concrete in a central mix plant, in a truck mixer or in a drum mixer at the work site. Provide plant capacity and delivery capacity sufficient to maintain continuous delivery at the rate required. The delivery rate of concrete during concreting operations must provide for the proper handling, placing and finishing of the concrete.

Seek the Engineer's approval of the concrete plant/batch site before any concrete is produced for the project. The Engineer will inspect the equipment, the method of storing and handling of materials, the production procedures and the transportation and rate of delivery of concrete from the plant to the point of use. The Engineer will grant approval of the concrete plant/batch site based on compliance with the specified requirements. The Engineer may, at any time, rescind permission to use concrete from a previously approved concrete plant/batch site upon failure to comply with the specified requirements.

Clean the mixing drum before it is charged with the concrete mixture. Charge the batch into the mixing drum such that a portion of the water is in the drum before the aggregates and cementitious material. Uniformly flow materials into the drum throughout the batching operation. All mixing water must be in the drum by the end of the first 15 seconds of the mixing cycle. Keep the throat of the drum free of accumulations restricting the flow of materials into the drum.

Do not exceed the rated capacity (cubic yards shown on the manufacturer's plate on the mixer) of the mixer when batching the concrete. The Engineer may allow an overload of up to 10% above the rated capacity for central mix plants and drum mixers at the work site, provided the concrete test data for strength, segregation and uniform consistency are satisfactory, and no concrete is spilled during the mixing cycle.

Operate the mixing drum at the speed specified by the mixer's manufacturer (shown on the manufacturer's plate on the mixer).

Mixing time is measured from the time all materials, except water, are in the drum. If it is necessary to increase the mixing time to obtain the specified percent of air in air-entrained concrete, the Engineer will determine the mixing time.

If the concrete is mixed in a central mix plant or a drum mixer at the work site, mix the batch between 1 to 5 minutes at mixing speed. Do not exceed the maximum total 60 mixing revolutions. Mixing time begins after all materials, except water, are in the drum, and ends when the discharge chute opens. Transfer time in multiple drum mixers is included in mixing time. Mix time may be reduced for plants utilizing high performance mixing drums provided thoroughly mixed and uniform concrete is being produced with the proposed mix time. Performance of the plant must conform to Table A1.1 of ASTM C94, Standard Specification for Ready Mixed Concrete. Five of the 6 tests listed in Table A1.1 must be within the limits of the specification to indicate that uniform concrete is being produced.

If the concrete is mixed in a truck mixer, mix the batch between 70 and 100 revolutions of the drum or blades at mixing speed. After the mixing is completed, set the truck mixer drum at agitating speed. Unless the mixing unit is equipped with an accurate device indicating and controlling the number of revolutions at mixing speed, perform the mixing at the batch plant and operate the mixing unit at agitating speed while travelling from the plant to the work site. Do not exceed 300 total revolutions (mixing and agitating). An additional 60 mixing revolutions may be allowed by the Engineer when plasticizers are designated in the mix design.

If a truck mixer or truck agitator is used to transport concrete that was completely mixed in a stationary central mixer, agitate the concrete while transporting at the agitating speed specified by the manufacturer of the equipment (shown on the manufacturer's plate on the equipment). Do not exceed 200 total revolutions (additional re-mixing and agitating).

Provide a batch slip including batch weights of every constituent of the concrete and time for each batch of concrete delivered at the work site, issued at the batching plant that bears the time of charging of the mixer drum with cementitious materials and aggregates. Include quantities, type, product name and manufacturer of all admixtures on the batch ticket.

On paving projects and other high-volume work, the Engineer will evaluate the haul time, and whether tickets will be collected for every load. Thereafter, random checks of the loads will be made. Maintain all batch tickets when not collected.

When non-agitating equipment is used for transportation of concrete, place within 30 minutes of adding the cement to the water. Provide approved covers for protection against the weather when required by the Engineer.

When agitating equipment is used for transportation of the concrete, place concrete within the time and temperature conditions shown in **TABLE 401-5**.

TABLE 401-5: AMBIENT AIR TEMPERATURE AND AGITATED CONCRETE PLACEMENT TIME

T = Ambient Air Temperature at Time of Batching (°F)	**Time limit agitated concrete must be placed within, after the addition of cement to water (hours)**	**Admixtures**
$T < 75$	1 ½	All Cases
$75 \leq T < 90$	1	None
$75 \leq T < 90$	1 ½	Set Retarder
T_c = Concrete Temperature at time of placement (°F)	**Time limit agitated concrete must be placed within, after the addition of cement to water (hours)**	**Admixtures**
$90 \leq T_c$ *	¾	All Cases
Other conditions contributing to quick stiffening of concrete	¾	All Cases

Do not use concrete that has developed its initial set. Regardless of the speed of delivery and placement, the Engineer will suspend the concreting operations until corrective measures are taken, if there is evidence that the concrete cannot be adequately consolidated.

Weather conditions and the use of admixtures can affect the set times for the concrete. Do not use the time limits and total revolutions as the sole criterion for rejection of concrete. Exceed the time limits and total revolutions only after demonstrating that the properties of the concrete can be improved. Evaluation of the consistency and workability should be taken into consideration. Reject concrete that cannot be adequately consolidated.

Adding water to concrete after the initial mixing is prohibited, with this exception:
If the concrete is delivered to the work site in a truck mixer, the Engineer will allow water (up to 2 gallons per cubic yard) be withheld from the mixture at the batch site, and if needed, added at the work site to adjust the slump to the specified requirements. Determine the need for additional water as soon as the load arrives at the construction site. Use a calibrated water-measuring device to add the water, and add the water to the entire load. Do not add more water than was withheld at the batch site. After the additional water is added, turn the drum or blades an additional 20 to 30 revolutions at mixing speed. The Engineer will supervise the adding of water to the load, and will allow this procedure only once per load. Conduct all testing for acceptance and produce any required cylinders after all water or admixtures have been added.

Do not add water at the work site if the slump is within the designated slump tolerance, even if water was withheld.

Do not add water at the work site if the percent air is above 8%, regardless of the slump, even if water was withheld.

Do not withhold and add water if plasticizer is added to the concrete mixture at the batch site.

If at any time during the placement of concrete it is determined that redosing with water is adversely affecting the properties of the concrete, the concrete will be rejected and the Engineer will suspend the practice.

b. Placement Limitations.

(1) Placing Concrete at Night. Do not mix, place or finish concrete without sufficient natural light, unless an adequate, artificial lighting system approved by the Engineer is provided.

(2) Placing Concrete in Cold Weather. Submit a cold weather concrete plan for approval to the Engineer prior to placing concrete in cold weather.

Unless authorized by the Engineer, discontinue mixing and concreting operations when the descending ambient air temperature reaches 40°F. Do not begin concreting operations until an ascending ambient air temperature reaches 35°F and is expected to exceed 40ºF.

If the Engineer approves the cold weather concrete plan, aggregates may be heated by either steam or dry heat system before placing them in the mixer. Use an apparatus that heats the mass uniformly and is so arranged as to preclude the possible occurrence of overheated areas which might injure the materials. Do not heat aggregates directly by gas or oil flame or on sheet metal over fire. Aggregates that are heated in bins, by steam-coil or water-coil heating, or by other methods not detrimental to the aggregates may be used. The use of live steam on or through binned aggregates is prohibited. Unless otherwise authorized, maintain the temperature of the mixed concrete between 50 to 90°F at the time of placing. Do not, under any circumstances, continue concrete operations if the ambient air temperature is less than 20°F.

If the ambient air temperature is 35°F or less at the time the concrete is placed, the Engineer may require that the water and the aggregates be heated to between 70 and 150°F.

Do not place concrete on frozen subgrade or use frozen aggregates in the concrete.

Make adjustments for potential longer set time and slower strength gain for concrete with SCMs. Adjust minimum time requirements as stated in **SECTION 710** for concrete used in structures. For concrete paving, be aware of the effect that the use of SCMs (except silica fume) may have on the statistics and moving averages.

401.9 INSPECTION AND TESTING

Unless otherwise designated in the Contract Documents or by the Engineer, obtain samples of fresh concrete for the determination of slump, weight per cubic yard and percent of air from the final point of placement.

The Engineer will cast, store and test strength and permeability test specimens in sets of 3.

KDOT will conduct the sampling and test the samples according to **DIVISION 2500** and the Sampling and Testing Frequency Chart in Part V. For QC/QA contracts, establish testing intervals within the specified minimum frequency.

The Engineer will reject concrete that does not comply with specified requirements.

The Engineer will permit occasional deviations below the specified cementitious content, if it is due to the air content of the concrete exceeding the designated air content, but only up to the maximum tolerance in the air content.

Continuous operation below the specified cementitious content for any reason is prohibited.

As the work progresses, the Engineer reserves the right to require the Contractor to change the proportions if conditions warrant such changes to produce a satisfactory mix. Any such changes may be made within the limits of the specifications at no additional compensation to the Contractor.

APPENDIX A – NON-MANDATORY INFORMATION

SUGGESTED GUIDELINES FOR MEETING KDOT'S PERMEABILITY SPECIFICATIONS

General:

Water and chlorides permeate through the mortar and paste of the concrete mixes. They do not readily permeate through the larger aggregates. Permeability can be improved by decreasing the mortar and paste of the concrete mix and increasing the coarse aggregate portions.

The use of optimized mix designs, blended cements, and/or supplementary cementitious materials (SCMs) can reduce the permeability of concrete. **SECTIONS 1102 and 1116**, Aggregates for Concrete describes optimized aggregate gradations for concrete mixes. Additional testing for alkali silica reaction (ASR) is required when SCMs are used in concrete as per **SECTION 401**. The amount of SCMs required to pass the ASR testing may be different than the amount required to comply with the permeability specifications. SCMs may also lower the necessary water cement (w/c) ratio and may slow set times and strength gain.

Optimizing the coarse aggregate gradations can decrease permeability. This includes mixes with more than 60% retained on the # 8 sieve and gradations with fineness modulus above 4.75. A fineness modulus of over 5.0 can yield even better results. Use the largest practical nominal maximum size aggregate allowed.

In general, keeping the w/c ratio below 0.43 may help meet the permeability specifications, as may lower cementitious content mixes when using Type I/II cements. These two properties control the paste in the mix. Concrete mixes with less than 25% paste (as displayed on KDOT Form 694) are more likely to pass the permeability specifications. Acceptable concrete can be mixed with paste contents of 23% or lower. Water cement ratios below 0.39 often do not provide enough water for all constituents to properly react, especially when admixtures are used, and may be counterproductive. High early strength concrete mixes using Type III cement and higher cementitious contents have also been able to pass the Standard Permeability requirements because of their low w/c ratios.

In general, the use of water reducers is helpful in reducing the paste content. Material compatibilities, following the admixture suppliers' recommendations for dosage rates, and the order of introduction of the chemicals into the mix are paramount to meeting KDOT specifications. Contractors should work with their admixture suppliers to find an admixture that works well with their combination of materials.

Changes made to an approved mix design will change the permeability, especially additional water, or redosing water that was withheld from the mix at a concrete plant. It is also recommended that concrete producers verify their mixes with a minimum of 3 cubic yards after doing their laboratory mix designs.

Standard Permeability Concrete (SPC) Requirements:

Volume of Permeable Voids 12.0% max, or
Surface Resistivity 9.0 kΩ-cm min, or
RCPT 3000 Coulombs max.

The SPC requirements may be met without the use of optimized mix designs, blended cements or SCMs. With certain aggregates, 25% slag cement will be required to pass the ASR testing. With other aggregates, a minimum of 40% slag cement by weight of total cementitious materials is usually needed. Some fly ashes require a minimum of 25% of the total cementitious material to pass the ASR test. Class C fly ash will react differently than Class F fly ash.

Some people believe that lower absorption aggregates have a better chance of meeting the permeability specification, but higher absorption aggregates have been used in concrete mixes utilizing these guidelines and have met the SPC specifications. KDOT has found that the properties of the concrete are often more important than the absorption of the aggregate when meeting this specification.

Moderate Permeability Concrete (MPC) Requirements:

Volume of Permeable Voids 11.0% max, or
Surface Resistivity 13.0 kΩ-cm min, or
RCPT 2000 Coulombs max.

Concrete mixes for MPC will require aggregates with a minimum Soundness of 0.95, a maximum LA Wear of 40, and a minimum Acid Insoluble Residue of 85%. These aggregates, by nature, are harder aggregates with very low absorption. MPC may rely more heavily on optimized gradations, blended cements or SCMs in order to meet the specification. Consideration could be given to ternary blends of cementitious materials, using more than one

SCM, or combining a blended cement with an additional SCM. Combinations of 25% to 30% slag cement with as little as 10% to 25% Class C fly ash have been very effective in keeping permeabilities below the level required for MPC. Incorporation of 20% Class F Fly Ash will often satisfy the requirements of the MPC specification.

Low Permeability Concrete (LPC) Requirements:

Volume of Permeable Voids 9.5% max, or
Surface Resistivity 27.0 kΩ-cm min, or
RCPT 1000 Coulombs max.

LPC will also use harder aggregates with very low absorption. These mixes must be optimized with the MA-6 gradation. Mix designs with 5% silica fume and 95% Type I/II cement often meet the LPC requirements. These mixes have traditionally been known as silica fume concrete. Ternary mix designs are useful in meeting these requirements. Consider using 3% to 5% silica fume with 25% to 30% slag cement, or 25% to 30% slag cements with 10% to 25% Class C fly ash. Class F fly ash alone may also be effective in reducing the permeability to these levels.

Contact KDOT's Bureau of Research or the District Office for additional guidance in meeting the Permeability Specifications.

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 710 and replace with the following:

SECTION 710

CONCRETE STRUCTURE CONSTRUCTION

710.1 DESCRIPTION

Construct concrete structures according to the Contract Documents. When Bridge Deck Grooving is a bid item in the contract, perform the grooving as shown in the Contract Documents.

BID ITEMS	UNITS
Concrete (*) (**) (***) (****)	Cubic Yard
Bridge Deck Grooving	Square Yard

*Grade of Concrete
**AE (air-entrained), if specified
***Aggregate, if specified
****MPC (Moderate Permeability Concrete), if specified

710.2 MATERIALS

Provide materials that comply with the applicable requirements.

Concrete[+]	**SECTIONS 401 & 402**
Aggregates for Concrete Not On Grade	**SECTION 1102**
Concrete Curing Materials	**DIVISION 1400**
Joint Sealing Compounds	**DIVISION 1500**
Type B Preformed Expansion Joint Filler	**DIVISION 1500**
Preformed Elastomeric Compression Joint Seals	**DIVISION 1500**
Bridge Number Plates	**DIVISION 1600**

[+] If Moderate Permeability Concrete (MPC) is not specified, the concrete shall meet the requirements for Standard Permeability Concrete.

710.3 CONSTRUCTION REQUIREMENTS

a. Falsework and Forms. Construct falsework and forms according to **SECTION 708**.

b. Handling and Placing Concrete. At a project progress meeting prior to placing concrete, discuss with the Engineer the method and equipment used for deck placement; include the equipment for controlling the evaporation rate and concrete temperature, procedures used to minimize the evaporation rate, method to place saturated burlap within the specified 15 minute limit. Provide plans to maintain a continuous supply of concrete throughout placement with an adequate quantity of concrete to complete the deck and filling diaphragms and end walls without cold joints.

Fogging using hand-held equipment may be required by the Engineer during unanticipated delays in the placing, finishing or curing operations. If fogging is required by the Engineer, do not allow water to drip, flow or puddle on the concrete surface during fogging, placement of absorptive material, or at any time before the concrete has achieved final set.

When required, produce a fog spray from nozzles that atomize the droplets and a system capable of keeping a large surface area damp without depositing excess water. Use high pressure equipment that generates a minimum of 1200 psi at 2.2 gpm, or low pressure equipment having nozzles capable of supplying a maximum flow rate of 1.6 gpm. Complete all floating before fogging.

Use a method and sequence of placing concrete approved by the Engineer. Do not place concrete until the forms and reinforcing steel have been checked and approved. Before placing concrete, clean all forms of debris. Drive all foundation piling in any one pier or abutment before concrete is poured in any footing or column of that pier or abutment.

On bridges skewed greater than 10º, place concrete on the deck forms across the deck on the same skew as the bridge, unless approved otherwise by State Bridge Office (SBO). Operate the bridge deck finishing machine on the same skew as the bridge, unless approved otherwise by the SBO.

Maintain environmental conditions on the entire bridge deck such that the evaporation rate is less than 0.2 lb/sq ft/hr. This may require placing the deck at night, in the early morning or on another day. The evaporation rate (as determined in the American Concrete Institute Manual of Concrete Practice 305R, Chapter 2) is a function of air temperature, concrete temperature, wind speed and humidity.

Just prior to and at least once per hour during placement of the concrete, the Engineer will measure and record the air temperature, concrete temperature, wind speed and humidity on the bridge deck. The Engineer will take the air temperature, wind and humidity measurements approximately 12 inches above the surface of the deck. With this information, the Engineer will determine the evaporation rate by using KDOT software or by using **FIGURE 710-1** (Figure 2.1.5 from the American Concrete Institute Manual of Concrete Practice 305R, Chapter 2).

When the evaporation rate is equal to or above 0.2 $lb/ft^2/hr$, take actions (such as cooling the concrete, installing wind breaks, sun screens etc.) to create and maintain an evaporation rate less than 0.2 $lb/ft^2/hr$ on the entire bridge deck.

Place concrete to avoid segregation of the materials and displacement of the reinforcement. Do not deposit concrete in large quantities at any point in the forms, and then run or work the concrete along the forms.

Deposit the concrete in the forms in horizontal layers. Perform the work rapidly and continuously between predetermined planes. Vibrate through each plane.

Fill each part of the form by depositing the concrete as near to the final position as possible. If the chutes for placement of concrete are on steep slopes, equip them with baffle boards or assemble in short lengths that reverse the direction of movement. Do not drop concrete in the forms a distance of more than 5 feet, unless confined by clean, smooth, closed chutes or pipes.

Work the coarse aggregate back from the forms and around the reinforcement without displacing the bars. After initial set of the concrete, do not disturb the forms, or place any strain on the ends of projecting reinforcement.

If placing concrete by pumping, place the concrete in the pipeline to avoid contamination or separation of the concrete, or loss of air by fitting the pump with a concrete brake (e.g. french horn or bladder valve) at the end of the pump boom. Obtain sample concrete for slump and air test requirements at the discharge end of the piping.

Do not use chutes, troughs or pipes made of aluminum.

Uniformly consolidate the concrete without voids.

Accomplish consolidation of the concrete on all span bridges that require finishing machines by means of a mechanical device on which internal (spud or tube type) concrete vibrators of the same type and size are mounted (**subsection 154.2**). Observe special requirements for vibrators in contact with epoxy coated reinforcing steel as specified in **subsection 154.2**. Provide stand-by vibrators for emergency use to avoid delays in case of failure.

Operate the mechanical device so vibrator insertions are made on a maximum spacing of 12-inch centers over the entire deck surface. Provide a uniform time per insertion of all vibrators of 3 to 15 seconds, or until the course aggregate particles are fully embedded, unless otherwise designated by the Engineer. Provide positive control of vibrators using a timed light, buzzer, automatic control. Smoothly extract the vibrators from the concrete at a rate to avoid leaving any large voids or holes in the consolidated concrete. Do not drag the vibrators horizontally through the concrete.

Use hand held vibrators (**subsection 154.2**) in inaccessible and confined areas such as along hubguards. When required, supplement vibrating by hand spading with suitable tools to provide required consolidation.

Reconsolidate any voids left by workers.

Deposit concrete in water, only with approval from the Engineer. Do not place concrete in running water.

Use forms that are reasonably watertight to hold concrete deposited under water. Increase the minimum cement factor of the grade of concrete being deposited in water by 10%, obtaining approximately a 6-inch slump. Carefully deposit the concrete in place, in a compact mass, using a tremie pumped through piping, bottom-dumping bucket or other approved method that does not permit the concrete to fall through the water. Do not pump water from the inside of the foundation forms while concrete is being placed. Do not disturb the concrete after being deposited. If necessary to prevent flooding, place a seal of concrete through a closed chute or tremie, and allow it to set.

Continuously place concrete in any floor slab until complete, unless shown otherwise in the Contract Documents.

The method used for transporting concrete batches, materials or equipment over previously placed single pour (non-overlaid) floor slabs or floor units, or over units of structures of continuous design types is subject to approval by the Engineer.

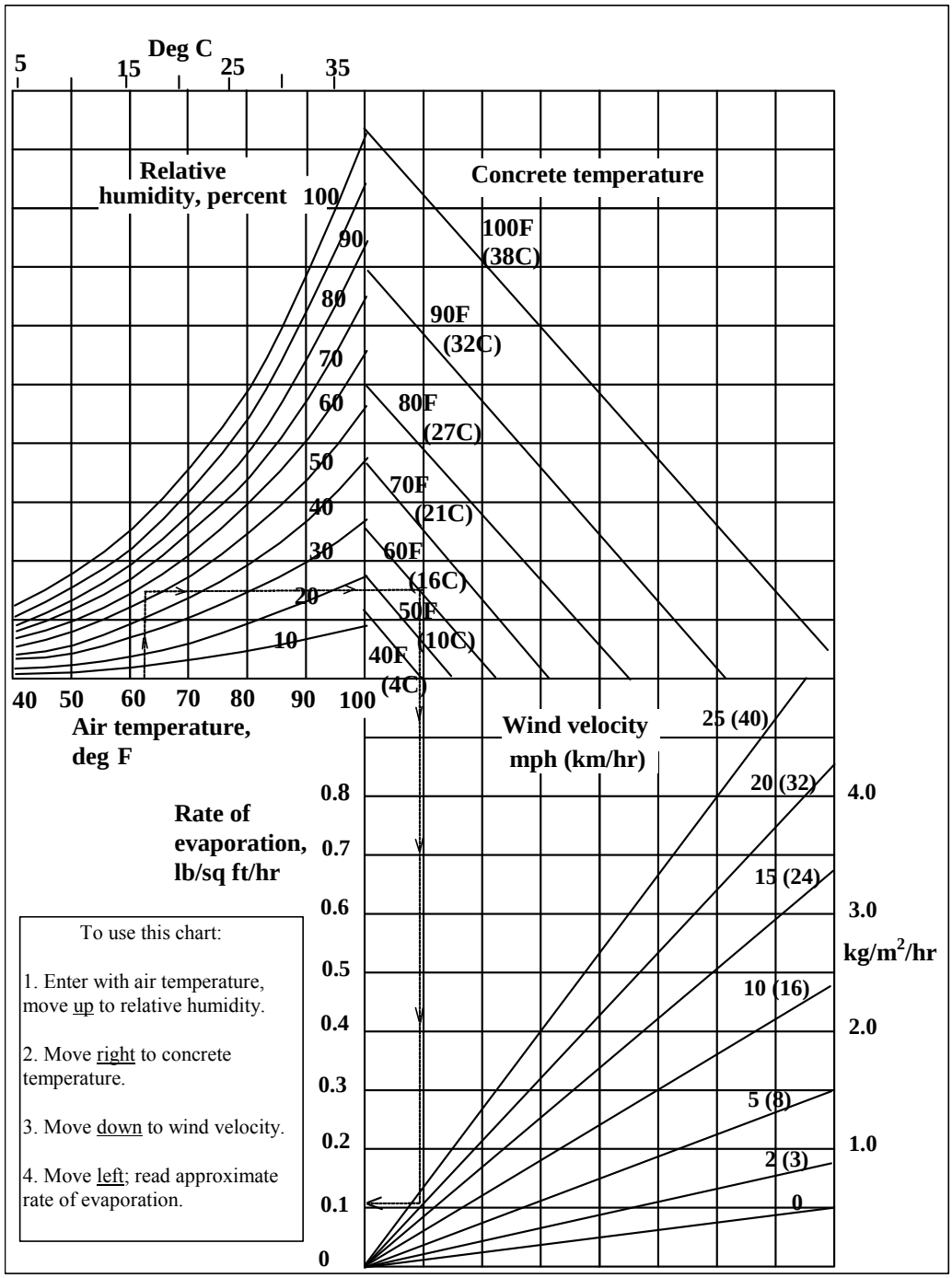
Do not operate bridge deck finishing equipment on previously placed concrete spans until:

- A minimum of 72 hours on structures that are fully supported with falsework;
- A minimum of 72 hours on structures with concrete girder spans with concrete decks; and
- A minimum of 96 hours on structures with steel girder spans with concrete decks.

The time delays begin after the day's pour has been completed.

Follow **TABLE 710-2** for load limitations after concrete placement. Prior to permitting approved traffic on the bridge deck, construct temporary bridge approaches and maintain them in a condition to prevent damage to the bridge ends.

FIGURE 710-1: STANDARD PRACTICE FOR CURING CONCRETE



Effect of concrete and air temperatures, relative humidity, and wind velocity on the rate of evaporation of surface moisture from concrete. This chart provides a graphic method of estimating the loss of surface moisture for various weather conditions. To use the chart, follow the four steps outlined above. When the evaporation rate exceeds 0.2 lb/ft^2/hr (1.0 kg/ m^2/hr), measures shall be taken to prevent excessive moisture loss from the surface of unhardened concrete; when the rate is less than 0.2 lb/ft^2/hr (1.0 kg/m^2/hr) such measures may be needed. When excessive moisture loss is not prevented, plastic cracking is likely to occur.

c. Construction Joints, Expansion Joints and End of Wearing Surface (EWS) Treatment. Locate the construction joints as shown in the Contract Documents. If construction joints are not shown in the Contract Documents, submit proposed locations for approval by the Engineer.

If the work of placing concrete is delayed and the concrete has taken its initial set, stop the placement, saw the nearest construction joint approved by the Engineer and remove all concrete beyond the construction joint. On post-tensioned structures construct a stepped joint as shown in the Contract Documents.

When the Contract Documents show a construction joint in the wall of the RCB 3 inches above the floor, the Contractor has the option of constructing the joint as shown on the Contract Documents, or constructing the joint level with the floor of the RCB. When the Contract Documents show a construction joint in the wall of the RFB 2 inches above the floor haunch, the Contractor has the option of constructing the joint as shown on the Contract Documents, or even with the top of the floor haunch of the RFB.

If dowels, reinforcing bars or other tie devices are not required by the Contract Documents, make a key in the construction joint. Construct keyed joints by embedding water-soaked beveled timbers of a size shown on the Contract Documents, into the soft concrete. Remove the timber when the concrete has set. When resuming work, thoroughly clean the surface of the concrete previously placed, and when required by the Engineer roughen the key with a steel tool. Before placing concrete against the keyed construction joint, the joint shall be cleaned of surface laitance, curing compound, and all other foreign material, use of abrasive blasting may be required to achieve the level of cleanliness required. Thoroughly wash the surface of the keyed joint with clean water, and allow the joint to dry to a saturated surface dry condition immediately prior to placing fresh concrete against the joint key.

(1) Bridges With Tied Approaches. When concrete is placed at the bridge EWS, embed 3 (½-inch by 8-inch) bolts to hold a header board for each traffic lane into the vertical surface of the EWS. Finish the surface of the EWS using an edging tool with a ¼ inch radius. Immediately after the vertical forms on the EWS are removed, protect the exposed EWS by bolting a wooden header (minimum dimension of 2 ⅝ inches by 7 ½ inches) to the exposed vertical surface of the EWS. Extend the header board the full width of the EWS, or use 1 section of header board for each lane of traffic. Shape the header board to comply with the crown of the bridge surface, and install it flush with the concrete wearing surface. Do not bend the reinforcing steel which will tie the approach slab to the EWS or damage the concrete at the EWS.

(2) Bridges Without Tied Approaches. Place the concrete for the approach slab, and at the end of the approach slab away from the EWS place bolts and attach a header board in the same manner required for bridges with tied approaches. If the Contractor needs to drive on the bridge before the approach slabs can be placed and cured construct a temporary bridge from the approach over the EWS capable of supporting the anticipated loads. The method of bridging must be approved by the Engineer.

d. Finishing. Finish all top surfaces, such as the top of retaining walls, curbs, abutments and rails, with a wooden float by tamping and floating, flushing the mortar to the surface and provide a uniform surface, free from pits or porous places. Trowel the surface producing a smooth surface, and brush lightly with a damp brush to remove the glazed surface.

Strike off bridge decks with a self-propelled finishing machine, which may be manually operated by winches to reach a temporary bulkhead when approved by the Engineer. The screed on the finish machine must be self-oscillating, and operate or finish from a position either on the skew or transverse to the bridge roadway centerline.

On decks skewed greater than 10º, operate the finishing machine on the same skew as the bridge, unless approved otherwise by the SBO. Before placing concrete, position the finisher throughout the proposed placement area allowing the Engineer to verify the reinforcing steel positioning.

Irregular sections may be finished by other methods approved by the Engineer. Reinforced concrete box bridges that will be under fill may be struck off by other approved methods.

Float and straightedge the wearing surface so the finished surface is at the cross-section shown in the Contract Documents. Do not add water to the surface of concrete. Do not float the concrete surface if fogging has commenced.

Secure a smooth riding bridge deck, correcting surface variations exceeding ⅛ inch in 10 feet by use of an approved profiling device, or other method approved by the Engineer.

Straightedge decks that are to receive an overlay, leaving them with an acceptable float or machine pan finish.

For decks not receiving an overlay, and without the bid item Bridge Deck Grooving, finish the deck with the rough burlap drag.

For decks not receiving an overlay, and with the bid item Bridge Deck Grooving, see **subsection 710.3f.** for grooving requirements.

Obtain reasonably true and even concrete surfaces, free from stone pockets, excessive depressions or projections on the surface. Strike off with a straightedge and float the concrete in bridge seats and walls flush with the finished top surface.

As soon as the forms are removed and the concrete is ready to hone, rub the concrete surfaces that are not in an acceptable condition, or are designated in the Contract Documents to be surface finished to a smooth and uniform texture with a carborundum brick and clean water. Remove the loose material formed on the surface, due to

the rubbing with a carborundum brick as soon as it dries. The finished surface shall be free from all loose material. Do not use a neat cement wash.

Give handrails, handrail posts, the deck side, and the top and end of all curbs, except curbs of structures having the top of curb below the final shoulder elevation of the road, an acceptable troweled or floated finish. This includes the back of the inside rails of side by side structures, or any rails easily viewed by the traveling public.

Remove the forms as early as possible, and perform the float finish while the concrete is still green. Use mortar during the float finish operation to fill in air and water voids and supplement the float finish. Keep surfaces requiring a rubbed finish moist before and during the rubbing. Do not use a mortar coating after the concrete has cured.

Unless otherwise provided in the Contract Documents, all reasonably true and even surfaces, obtained by use of a form lining, which are of a uniform color, free from stone pockets, honeycomb, excessive depressions or projections beyond the surface, are considered as acceptable surfaces, and a rubbed surface finish is not required.

The Engineer may require the use of a dry carborundum brick for straightening moulding lines, removing fins or requiring a rubbed surface finish on all portions of the structure that do not present an acceptable surface even though a form lining is used.

e. Curing and Protection.

(1) General. Cover concrete surfaces according to **TABLE 710-1**. Cure all pedestrian walkway surfaces in the same manner as the bridge deck. The determination of the time requirement for curing commences after all the concrete for the placement is in place and finished. During cold weather, the specified time limits may be increased at the discretion of the Engineer, based upon the amount of protection and curing afforded the concrete.

Maintain a damp surface until the saturated burlap is placed. Fully saturate burlap before placing on concrete surface. Cover all concrete surfaces with saturated burlap within 15 minutes after finishing the concrete, do not mar concrete during placement of the saturated burlap. When times of delay are expected to exceed 15 minutes, cover all concrete that has been placed, but not finished, with saturated burlap. Maintain the curing so that moisture is always present at the concrete surface.

Place and weight down the saturated burlap so it will remain in intimate contact with the surface covered.

When an impermeable sheeting material is used, lap each unit 18 inches with the adjacent unit. Place and weight down the impermeable sheeting material so it will remain in intimate contact with the surface covered. When any burlap or impermeable sheeting material becomes perforated or torn, immediately repair it, or discard and replace it with acceptable material.

TABLE 710-1: MINIMUM CURE TIMES AND CURING MEDIUMS		
Type of Work	**Minimum Cure Time (days)**	**Curing Medium and Use**
Bridge decks (full-depth decks with multi-layer polymer overlays) Bridge subdecks (decks with overlays)	14 Wet	Saturated burlap covered with white polyethylene sheeting during the 14-day period. See **subsection 710.3e.(5)**.
Bridge decks (full-depth decks with no overlay) Bridge Overlays (new and existing structures)	14 Wet Plus 7 Curing Membrane	Saturated burlap covered with white polyethylene sheeting during the 14-day period. See **subsection 710.3e.(5)**. After the wet cure period, apply 2 coats of Type 2 white liquid membrane forming compound. Place the first coat within 30 minutes of removing the sheeting and saturated burlap. Spray the second coat immediately after and at right angles to the first application. Protect the curing membrane against marring for a minimum of 7 days. The Engineer may limit work during this 7-day period.
Other unformed or exposed surfaces	7 Curing Membrane	Apply 2 coats of Type 2 white liquid membrane forming compound. Place the first coat immediately after completion of the concrete finish just as the surface water disappears. Spray the second coat immediately after and at right angles to the first application. Protect the curing membrane against marring for a minimum of 7 days. The Engineer may limit work during this 7-day period. Should the compound be subjected to continuous damage, the Engineer will require saturated burlap, white polyethylene sheeting or other approved impermeable material to be applied at once for the remainder of the cure time.
Formed sides and ends of bridge wearing surfaces and bridge curbs Other formed surfaces	4 Formed	Formed surfaces will be considered completely cured upon the Engineer's permission to remove the forms, providing the forms have been in place for a minimum of 4 days. If forms are removed before the end of the 4-day cure period, cure the surface with an application of Type 1-D liquid membrane forming compound.

(2) Liquid Membrane Forming Compounds. Use spraying equipment capable of supplying a constant and uniform pressure to provide uniform distribution at the rates required. Agitate the liquid membrane forming compound continuously during application. The surface must be kept wet from the time it is finished until the liquid membrane forming compound is applied. Apply liquid membrane forming compound at a minimum rate per coat of 1 gallon per 200 square feet of concrete surface.

Give marred or otherwise damaged applications an additional coating.

If rain falls on the newly coated concrete before the film has dried sufficiently to resist damage from the rain, or if the film is damaged by any other means, apply a new coat of the membrane to the affected portion equal in curing value to the original application.

(3) Bridge Subdecks and Decks. Provide a work bridge to facilitate application of all curing materials. Maintain the curing so that moisture is always present at the concrete surface.

Maintain the saturated burlap in a fully wet condition using misting hoses, self-propelled, machine-mounted fogging equipment with effective fogging area spanning the deck width, moving continuously across the entire burlap-covered surface, or other approved devices until the concrete has set sufficiently to allow foot traffic. At that time, place soaker hoses on the saturated burlap, and supply running water continuously to maintain continuous saturation of

all burlap material to the entire concrete surface. For bridge decks with superelevation, place a minimum of 1 soaker hose along the high edge of the deck to keep the entire deck wet during the curing period.

If the concrete surface temperature is above 90ºF, do not use polyethylene sheeting in direct sunshine during the day for the first 24 hours of the specified curing period (**TABLE 710-1**). White polyethylene sheeting may be used at night to maintain the required damp condition of the burlap. When polyethylene sheeting is used over the saturated burlap at night during the first 24 hours and the concrete surface temperature is above 90ºF, place the polyethylene sheeting a maximum of 1 hour before sunset, and remove the polyethylene sheeting within 1 hour after sunrise. After the first 24 hours, the polyethylene sheeting may be left in place continuously for the remainder of the curing period provided the saturated burlap is kept saturated.

Construction loads on the new bridge subdeck, new one-course deck or any concrete overlay are subject to the limitations in **TABLE 710-2**. The use of supplemental cementitious materials will require additional time before specified loading is allowed.

TABLE 710-2: CONCRETE LOAD LIMITATIONS ON BRIDGE DECKS

Days after concrete is placed	Element	Allowable Loads
1*	Subdeck, one-course deck or concrete overlay	Foot traffic only.
3*	One-course deck or concrete overlay	Work to place reinforcing steel or forms for the bridge rail or barrier.
7*, Δ	Concrete overlays	Legal Loads; Heavy stationary loads with the Engineer's approval.***
10 *, Δ (15)**, Δ	Subdeck, one-course deck or post-tensioned haunched slab bridges	Light truck traffic (gross vehicle weight less than 5 tons).****
14 *, Δ (21)**, Δ	Subdeck, one-course deck or post-tensioned haunched slab bridges	Legal Loads; Heavy stationary loads with the Engineer's approval.***Overlays on new decks.
28	Bridge decks	Overloads, only with the State Bridge Engineer's approval.***

*Maintain the specified wet cure at all times (**TABLE 710-1**).

** All haunched slab structures.

*** Submit the load information to the appropriate Engineer. Information that will be required is the weight of the material and the footprint of the load, or the axle (or truck) spacing and the width, the size of each tire (or track length and width) and their weight.

****An overlay may be placed using pumps or conveyors until legal loads are allowed on the bridge.

Δ Increase time period by 3 days when supplemental cementitious materials are used October 1 thru April 30.

(4) Surfaces Requiring Rubbed Finish. Apply Type 1-D liquid membrane-forming compound immediately after the surface is completed, and while the concrete is still damp.

(5) Cold Weather Curing. If concrete is placed in cold weather, comply with **SECTION 401**.

If concrete is placed and the ambient air temperature is expected to drop below 40ºF during the entire specified curing period, prior to beginning concrete placement, provide materials on site to maintain the concrete temperature between 40 and 90ºF as measured on the surface of the concrete. Suitable materials consist of straw, additional burlap or other blanketing materials or housing and artificial heat.

Keep the surface of the concrete moist by the use of an approved moisture barrier such as saturated burlap or polyethylene sheeting or both as defined in **TABLE 710-1**. Maintain the moisture barrier in intimate contact with the concrete during the entire specified curing period.

(6) Thermal Shock. After the completion of the required curing period, remove the curing and protection to prevent rapid cooling of the concrete so that the concrete temperature does not fall more than 25°F during the first 24 hours.

(7) If concrete is placed in cofferdams and subsequently flooded with ground water, the specified curing conditions are waived providing the surface of the water does not freeze.

f. Grinding and Grooving. Correct surface variations exceeding ⅛ inch in 10 feet by use of an approved profiling device, or other methods approved by the Engineer after the curing period. Perform grinding on hardened concrete after the specified curing membrane period (**TABLE 710-1**) to achieve a plane surface and grooving of the final wearing surface as shown in the Contract Documents. Apply the corrective measure to the full width of the lane. The corrected areas shall have uniform texture and appearance. The beginning and ending of the corrected areas shall be squared normal to centerline of the paved surface.

If at least 25% of the traveled way of the deck needs ground to correct surface variations, grind the entire deck.

Use a self-propelled grinding machine with diamond blades mounted on a multi-blade arbor. Avoid using equipment that causes excessive ravels, aggregate fractures or spalls. Remove from the project and properly dispose of the material. Do not allow the grinding slurry to flow across lanes being used by traffic, onto shoulder slopes, into streams, lakes, ponds or other bodies of water, or gutters or other drainage facilities. Do not place grinding slurry on foreslopes.

After any required grinding is complete and after the specified curing membrane period (**TABLE 710-1**), give the surface a suitable texture by transverse grooving. Use diamond blades mounted on a self-propelled machine that is designed for texturing pavement. Transverse grooving of the finished surface may be done with equipment that is not self-propelled providing that the Contractor can show proficiency with the equipment. Use equipment that does not cause strain, excessive raveling, aggregate fracture, spalls, disturbance of the transverse or longitudinal joint, or damage to the existing concrete surface. Make the grooving approximately $^{3}/_{16}$ inch in width at ¾ inch centers and the groove depth approximately ⅛ inch. Terminate the transverse bridge deck grooving approximately 2 feet in from the base of the rail, and 1 foot from any deck drains or other appurtenances.

If after corrective measures are made, more than ½ inch of the deck was ground at any location, the Engineer may require a multi-layer polymer concrete overlay over the whole deck, according to **SECTION 729**, at no additional cost to KDOT.

g. Removal of Forms and Falsework. Do not remove forms and falsework without the Engineer's approval. During cold weather, the specified time limits may be increased at the discretion of the Engineer, based upon the amount of protection and curing afforded the concrete.

Do not remove forms and falsework until the minimum amount of time required for strength gain has elapsed regardless if the concrete is fully cured per **TABLE 710-1**.

If forms are removed before expiration of the cure period, maintain the cure as provided in **DIVISION 700**. Remove forms on handrails, ornamental work and other vertical surfaces that require a rubbed finish as soon as the concrete has hardened sufficiently that it shall not be damaged.

Under normal conditions, the Engineer will allow removal of forms and falsework according to **TABLE 710-3**. The determination of the time requirement for the removal of forms commences after all the concrete for the placement is in place and finished. If high early strength concrete is used, the specified time limits may be decreased as determined by the Engineer, and agreed upon before placing the concrete.

TABLE 710-3: MINIMUM STRENGTH GAIN TIME BEFORE REMOVAL OF FORMS & FALSEWORK (DAYS)

Type of Work	Span Length (feet)						
	Less than 10	10 or less	Greater than 10	10 to 20	20 + to 30	Greater than 20	Greater than 30
Cantilevered Piers - Formwork (supporting the pier beam) supported on column		7$^{\Delta}$ [4]*	10$^{\Delta}$ [6]*				
Column Bent Piers - Falsework supporting pier beam**	4$^{\Delta}$			7$^{\Delta}$ [4]*		10$^{\Delta}$ [6]*	
Forms and Falsework under slabs, beams, girders, arches and brackets***	4$^{\Delta}$			7$^{\Delta}$ [4]$^{+}$	10$^{\Delta}$ [6]$^{+}$		15$^{\Delta}$ [10]$^{+}$
RCB and RFB top slabs not re-shored		7$^{\Delta}$ [4]$^{+}$		7$^{\Delta}$ [4]$^{+}$		10$^{\Delta}$ [6]$^{+}$	

Type of Work	Time (Days)$^{++}$
Walls, Wing Walls and vertical sides of RCB and RFB structures	4$^{\Delta}$ [3]*
Footing Supported on Piles - minimum cure before erecting forms and reinforcing steel for columns	4$^{\Delta}$ [2]*
Spread Footing founded in rock – minimum before erecting forms and reinforcing steel for columns	2$^{\Delta}$
Columns for cantilevered piers - 1. minimum before supporting forms and reinforcing steel for the pier beam on the column. 2. minimum before placing concrete for the pier beam	4$^{\Delta}$ [2]$^{+}$ 7$^{\Delta}$ [4]$^{+}$
Columns for bent piers - 1. minimum before erecting formwork and reinforcing steel for the pier beam 2. minimum before placing concrete for the pier beam	2$^{\Delta}$ 4$^{\Delta}$ [2]*
Drilled shafts - minimum before erecting forms and reinforcing steel for the columns	2$^{\Delta}$
Floors for RCB and RFB structures on rock or a seal course - minimum before erecting forms and reinforcing steel	2$^{\Delta}$
Floors for RCB and RFB structures on soil or foundation stabilization - minimum before erecting forms and reinforcing steel	4$^{\Delta}$ [2]*
Do not remove forms or falsework from post tensioned elements until all applied post tensioning forces are transferred.	NA

* Contractors may reduce the time required before form removal to the number of days shown in brackets, provided the concrete is shown to have attained a minimum strength of 65% of the specified f'$_c$. To accomplish this, prepare the necessary cylinders, obtain the services of an approved laboratory to break them at the appropriate time and provide a report to the Engineer. Field cure the cylinders alongside and under the same curing conditions, as the concrete they represent.

** Do not set girders or beams on the pier beams until the falsework under the pier beams is removed.

*** Remove the formwork from subdecks or one-course decks within 6 weeks after the deck has been placed.

$^{+}$ Contractors may reduce the time required before form removal to the number of days shown in brackets, provided the concrete is shown to have attained a minimum strength of 75% of the specified f'$_c$. To accomplish this, prepare the necessary cylinders, obtain the services of an approved laboratory to break them at the appropriate time and provide a report to the Engineer. Field cure the cylinders alongside and under the same curing conditions, as the concrete they represent.

$^{\Delta}$ Increase the time period 3 days when supplemental cementitious materials are used October 1 thru April 30.

$^{++}$ See **SECTION 204**.

Reshoring of RCB and RFB (classified as culverts or bridges) top slab will be permitted if the Contractor uses traveling forms or to reduce the minimum time shown in **TABLE 710-2**. At the Preconstruction Conference, submit calculations, sealed by a Professional Engineer, to the Engineer that show that the concrete tensile stress is below 0.23 $\sqrt{f'_c}$ (ksi) and the shoring has sufficient capacity.

In determining the time for the removal of forms, give consideration to the location and character of the structure, weather and other conditions influencing the setting of concrete. If forms are removed before expiration of the cure period, maintain the cure as provided in **DIVISION 700**.

For additional requirements regarding forms and falsework, see **SECTION 708**.

i. Bridge Number Marking. When designated in the Contract Documents, place bridge numbers on bridges by the use of plates recessed in the concrete during construction, using plates constructed as shown in the Contract Documents. The date placed on the plates is the year in which the structure is completed.

710.4 MEASUREMENT AND PAYMENT

The Engineer will measure the various grades of concrete placed in the structure by the cubic yard. No deductions are made for reinforcing steel and pile heads extending into the concrete. When shown as a bid item in the contract, the Engineer will measure for payment bridge deck grooving by the square yard.

Payment for the various grades of "Concrete" and "Bridge Deck Grooving" at the contract unit prices is full compensation for the specified work.

01-30-18 BSGS/R (JPJ/MLL)
May-18 Letting

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 708 and replace with the following:

SECTION 708

FALSEWORK AND FORM CONSTRUCTION

708.1 DESCRIPTION

Design and construct safe, adequate falsework to provide the necessary rigidity, support the loads imposed and produce the final structure to the lines and grades shown in the Contract Documents.

Perform falsework inspection as required by this specification.

Falsework is defined to be any temporary structure which supports structural members or form work.

BID ITEM	UNITS
Falsework Inspection	Lump Sum

708.2 MATERIALS

Use sound falsework piling to withstand driving, is reasonably straight, and is of sufficient size to provide the strength to safely carry the actual loads imposed. Use sound timber in good condition and free from defects that might impair its strength.

All approved metal or wood forms shall present a smooth surface, be mortar tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incident to the construction operations, including placement and vibration of the concrete.

Do not use aluminum forms in contact with concrete.

708.3 CONSTRUCTION REQUIREMENTS

a. Falsework Design.

(1) General Falsework Design Requirements. Design falsework according to the KDOT Bridge Design Manual, Falsework Design, Analysis and Inspection.

Include the type, size, grade and finish of all lumber used. Provide adequate details of the proposed method of construction. The Engineer may request additional information.

In designing forms and centering, regard concrete as a liquid. In computing loads, assume a weight of 150 pounds per cubic foot for the vertical pressure, and a minimum of 85 pounds per cubic foot in computing horizontal pressure.

Do not place cast-in-place shear bolts, coil inserts or other devices used as falsework support in pier columns without the approval of the Engineer. Through bolts are permitted. Do not drill and grout bolts or other devices into the pier columns unless shown in the Contract Documents.

(2) Category 1 Structures. On the structures listed below, submit to the Engineer for review (See **SECTION 105**) by the State Bridge Office (SBO) (or Bureau of Local Projects) and, if applicable, the railroad company, 7 copies of detailed falsework plans designed and sealed by a Professional Engineer.

- All structures over or under railroad tracks;
- All structures built over highways or streets carrying traffic;
- All structures requiring falsework that directly carries highway traffic loads during construction;
- Deck overhangs greater than beam depth or greater than 54 inches;
- Superstructure forming with "non-typical" support (i.e. needlebeams); and
- All structures that require falsework plans to be submitted to the SBO (or Bureau of Local Projects) as noted in the Contract Documents.

(3) Category 2 Structures. If not included in the Category 1 structures above, submit to the Engineer for review (See **SECTION 105**) by the Field Engineer, 3 copies of detailed falsework plans designed and sealed by a Professional Engineer on the Category 2 structures listed below.

- All cast-in-place span structures supported on falsework;
- Concrete Box Structures with cell spans greater than 16 feet or cell heights greater than 14 feet;

- Decks with girder spacing equal to or greater than 14 feet; and
- Substructure forming with "non-typical" support.

Falsework or formwork details for deck construction are not required for all other structural steel, prestressed concrete girder and reinforced concrete box bridge construction.

b. Falsework Construction. Adhere to all falsework details.

Drive falsework piling to a satisfactory depth and bearing value to support all falsework that is not founded on rock, shale or thick deposits of other compact material in their natural beds. Do not use mudsills on earth, sand, gravel and similar materials, unless otherwise noted in the Contract Documents. Do not support falsework on any part of the structure, except the footings, without written approval from the Engineer. The number and spacing of falsework piling, the adequacy of sills, caps and stringers, and the amount of bracing in the falsework framing is subject to approval of the Engineer.

If the falsework piling or vertical members are of sufficient length to cap at the desired elevation for the horizontal members, cap them and construct frames to the proper elevation. If falsework piling are not of sufficient length, extend them using an approved pile splice. Do not use wedges at pile splices. Cut the ends of the piling or vertical members square for full bearing. If vertical splices are necessary, the abutting members shall be of the same approximate size, with the ends cut square for full bearing. Provide an adequate splice to maintain rigidity of the joint, including inserting a #9 reinforcing bar 18 inches into each end of the abutting members.

Upon completion, remove all forms and falsework according to **SECTION 710**. Pull or cut off falsework piling 12 inches below low water level, the natural ground or the bottom of a channel change. On grade separation structures, pull or cut off the falsework piling 12 inches below subgrade elevation of the roadbed that the piles are driven into. Pull or cut off all other falsework piling 12 inches below finished grade.

Unless the Contract Documents provide for permanent camber, construct the falsework to provide only sufficient camber to prevent final settlement below the finish grades shown in the Contract Documents. Use adequate hardwood wedges or screw jacks in all falsework construction, and place and adjust them to provide the proper form alignment. If required, provide a means for adjusting forms to offset any excessive settlement. When screw jacks are used, adequately brace and secure them to prevent tipping of the jacks in any direction.

c. Falsework Inspection Requirements. For Category 1 structures, the falsework designer of record shall make a Falsework Inspection of the as-built falsework for substantial compliance with the falsework plans prior to placing concrete in the structure.

Conduct an on-site review of the falsework with the Field Engineer. Items to be reviewed include but are not limited to:

- The condition of the materials used for piling, cross bracing, beams, plywood decking, shims and jacks.
- The size and spacing of all structural members regarding their compliance to the submitted falsework plan.
- The condition and compliance of all splices.

Provide written documentation to the Engineer stating the falsework as-built is acceptable and in compliance with the original sealed plans. If the falsework is not in compliance, make corrections to the falsework or submit a revised, sealed falsework design prior to the placement of any concrete. When modifications are made to the falsework, the designer of record shall make Falsework Inspections until written documentation is provided to the Engineer stating that the falsework is in compliance, at no additional cost to KDOT.

For Category 2 falsework plans, conduct a walk-though review of the falsework with the Field Engineer, prior to placing concrete in the structure. Variations and deficiencies from the plan will be noted in writing and supported with photos or sketches. Forward the documentation to the falsework designer. The designer must respond in writing that the deficiencies are minor and the falsework is in substantial compliance, or must propose a new falsework plan which addresses the deficiencies.

The Engineer will refuse approval to proceed with other phases of the work if the falsework is determined to be unsafe or inadequate to properly support the subjected loads.

d. Forms. Do not separate forms at joints. Design the forms to permit easy removal without injury to the concrete. Use form lining such as plywood or metal forms for all exterior exposed surfaces which shall be visible after backfilling. The inside surface of the walls and slab of box culverts and bridges, the inside arch ring of arch culverts and bridges, the underneath surface of all floor slabs and the interior vertical surfaces of girders do not require form lining. Extend the forms to low water level, 1 foot below the bottom of the channel, or the top of the completed backfill. Use forms in the largest practical panels to minimize joints. Do not use small panels. If wooden panels are used, place the adjacent panels so that the grain of the wood shall be in the same general

direction (all horizontal or all vertical). Undressed lumber of uniform thickness may be used as backing for the form lining. Dressed, sized lumber of uniform thickness may be used for all other exposed surfaces. Wooden plyform of adequate thickness, which is supported to meet these requirements, may be used alone in lieu of the lined forms.

Maintain forms to eliminate warping and shrinkage. Check dimensions and condition immediately before placing concrete. The Engineer may at any time require the revision or reconstruction of forms to maintain satisfactory work, and may refuse approval to place concrete within the forms until they are satisfactorily constructed. If during or after placing the concrete, the forms show signs of sagging or bulging, remove the concrete to the extent directed by the Engineer, bring the forms to the proper position and place new concrete.

Metal forms shall be of such thickness that the forms shall remain true to shape, line and grade. Countersink all bolt and rivet heads. Design clamps, pins or other connecting devices to hold the forms rigidly together, and allow removal without injury to the concrete. Exercise care to keep metal forms free from rust, grease or other foreign matter. Any form which will leave permanent impressions or ridges will not be approved.

Before placing the reinforcing steel, oil the inside of all forms for exposed surfaces (except those lined with certain composition materials) with a light, clear, paraffin base oil that will not discolor or otherwise injure the surface of the concrete.

Moisten wooden forms with water before placing the concrete.

Consider the nature of the work when determining the width and thickness of the lumber, and the size and spacing of studs and wales. Provide the size and spacing of studs and wales to maintain rigidity of the forms, and prevent distortion of the forms due to the pressure of the concrete.

Use either steel or non-metallic form bolts, rods and ties. Use the type that permits the major part of the tie to remain permanently in the structure. Hold forms in place by devices attached to the wales capable of developing the strength of the ties. The Engineer may permit the use of wire ties on irregular sections and incidental construction if the concrete pressures are nominal and the form alignment is maintained by other means. Remove the ties on all exposed surfaces. Remove steel ties to a depth a minimum of ½ inch below the concrete surface. Non-metallic ties may be removed flush with the concrete surface. Cut wire ties back a minimum of ¼ inch below the concrete surface. Fill the cavities on exposed surfaces with cement mortar and leave the surface sound, smooth, even and uniform in color. Tar or roofing cement is acceptable for filling cavities on unexposed surfaces. Do not use form ties through forms for handrail. Remove wood, or metal spreaders as the concrete is placed. Do not use cofferdam braces or struts that extend through the forms for any concrete section. An exception may be approved in unusual situations.

Where the bottom of the forms is inaccessible, make provisions so that extraneous material can be removed from the forms immediately before placing the concrete.

Bevel all exposed edges by using dressed, triangular molding having ¾-inch sides unless provided otherwise in the Contract Documents.

Steel traveling forms may be used on reinforced concrete box structures or other applications when approved by the Engineer. Continuance of the use of such forms is based on satisfactory performance. Steel traveling forms may be discontinued at any time the Engineer determines their use is unsatisfactory. If traveling forms are used, provide supports as listed in **TABLE 708-1** before loosening and moving the forms.

TABLE 708-1: MAXIMUM SPACING PERMITTED FOR SUPPORTS	
spans up to 9 feet	1 support located at center of span
spans 9 to 14 feet	2 supports located at third points of span
spans over 14 to 18 feet	3 supports located at quarter points of span

The maximum longitudinal spacing of the supports is at 4-foot centers. The time the supports must be left in place is specified in **TABLE 710-3**. Do not loosen and move the forms until the concrete has been in place a minimum of 14 hours. When concrete is exposed as a result of moving the forms after the minimum 14 hours, but before the stipulated curing time, immediately coat the concrete with liquid membrane-forming compound applied according to **DIVISION 700**.

708.4 MEASUREMENT AND PAYMENT

The Engineer will not measure Falsework Design, Falsework Construction or Forms (design or construction) for payment.

On structures designated as Category 1 by KDOT, the Engineer will measure falsework inspection by the Lump Sum when the report is received stating the falsework is in substantial compliance. Falsework inspection on Category 2 structures is subsidiary to other items of the contract. If KDOT designated the structure as Category 2, and the Contractor's operations (use of non-typical supports) cause the falsework to become Category 1, the Engineer will not measure the falsework inspection for separate payment.

Payment for "Falsework Inspection" on structures designated by KDOT as Category 1 is full compensation for the specified work.

01-15-2020 C&M (SKE)
Sep-2020 Letting

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2015

Delete SECTION 902 and replace with the following:

SECTION 902
TEMPORARY EROSION AND SEDIMENT CONTROL

902.1 DESCRIPTION

Install, maintain and remove temporary erosion and pollution control devices as required during the construction of the project.

BID ITEMS	UNITS
Temporary Berm (Set Price)	Linear Foot
Temporary Slope Drain	Linear Foot
Silt Fence	Linear Foot
Biodegradable Log (***)	Linear Foot
Synthetic Sediment Barrier	Linear Foot
Filter Sock (***)	Linear Foot
Temporary Ditch Check (Rock)	Cubic Yard
Temporary Inlet Sediment Barrier	Each
Temporary Sediment Basin	Cubic Yard
Temporary Stream Crossing	Each
Sediment Removal (Set Price)	Cubic Yard
Temporary Fertilizer (**)	Pound
Temporary Seed (**)	Pound
Soil Erosion Mix	Pound
Erosion Control (*)(**)	Square Yard
Mulching	Ton
Water (Erosion Control) (Set Price)	M Gallon
Geotextile (Erosion Control)	Square Yard

* Class
** Type
*** Size

902.2 MATERIALS

Provide erosion control devices, sediment barriers, fertilizers, seeds, soil erosion mix, erosion control materials and mulch that comply with **DIVISION 2100**.

Provide aggregate that complies with aggregate ditch lining, D_{50} = 6 inches, **DIVISION 1100**. Existing aggregate from the project may be used under this specification, provided all applicable physical requirements are met.

Provide water for erosion control that complies with **DIVISION 2400**.

Provide geotextile (erosion control) that complies with **DIVISION 1700** for separation geotextile.

Provide aggregate filler that complies with Filter Course Type I, **DIVISION 1114**. The Engineer will accept this material on the basis of visual inspection at the point of usage.

Provide metal pipe, plastic pipe or flexible rubber pipe for temporary slope drains. The Engineer will accept the material for temporary slope drain based on the condition of the pipe and visual inspection of the installed drain.

902.3 CONSTRUCTION REQUIREMENTS

a. General. If the contract does not include temporary erosion and sediment control bid items, and such work is required, items will be added as provided for in **SECTION 104**.

Use KDOT's Temporary Erosion Control Manual and standard plan sheets or approved alternate reference documents as a guide for the design, installation and maintenance of temporary erosion and sediment control best management practices (BMPs.).

Alternate BMP references include:

- EPA – Stormwater Menu of BMP: (http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-Stormwater-Run-Off-Control.cfm)
- Mn/DOT – Erosion and Sediment Control Pocketbook Guide: (http://www.dot.state.mn.us/environment/erosion/pdf/2006mndotecfieldhandbook.pdf)
- NDOR – Construction Stormwater Pocket Guide: (http://www.transportation.nebraska.gov/environment/guides/Const-Strmwtr-Pocket%20Guide.pdf)
- Additional reference material available on KDOT's internet website: (http://www.ksdot.org/bureaus/burconsmain/Connections/swppp.asp).

b. Temporary Berms. Use temporary berms to divert storm runoff to stabilized slopes or temporary slope drains. Construct temporary berms as shown in the Contract Documents. Compact the berms until no further consolidation is observed, using a dozer track, grader wheel or other equipment.

c. Temporary Slope Drains. Use temporary slope drains to carry storm runoff down fill slopes and cut backslopes. Construct the temporary slope drains as shown in the Contract Documents.

d. Silt Fence. Install silt fence for slope barriers or ditch checks as shown in the SWPPP. When conditions warrant, supplement the temporary silt fence with a support fence. Reduce the post spacing and drive the posts further in the ground in low and soft, swampy areas. Remove and dispose of sediment deposits when the deposit approaches ⅓ the height of the silt fence.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

e. Biodegradable Logs. Install biodegradable logs for slope barriers or ditch checks as shown in the SWPPP. Remove and dispose of sediment deposits when the deposit approaches ½ the height of the biodegradable log.

Do not use straw logs for ditch checks or inlet sediment barriers.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

f. Synthetic Sediment Barriers. Install synthetic sediment barriers for slope barriers or ditch checks as shown in the SWPPP. Remove and dispose of sediment deposits when the deposit approaches ½ the height of the barrier.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

g. Filter Sock. Install filter socks with approved filler as shown in the SWPPP. Use coarse aggregate filler for protection of curb and gutter inlets.

h. Temporary Ditch Check (Rock). Use rock and aggregate filler to construct temporary rock ditch checks as shown in the SWPPP or the Contract Documents. When deposits reach approximately ½ the height of the temporary rock ditch check, remove and dispose of the accumulated sediment. Aggregate filler may be part of an aggregate ditch lining.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

i. Temporary Inlet Sediment Barrier. Use any of the materials listed in the Contract Documents or the SWPPP to construct temporary inlet sediment barriers. Prefabricated protection devices or alternative systems may be used with the Engineer's approval. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed system. Submit this information with the SWPPP documents for approval under **subsection 901.3.c**.

When temporary silt fence is used, reduce post spacing and drive the posts further into the ground in low and soft, swampy areas. Remove and dispose of the sediment when deposits reach approximately ⅓ the height of the silt fence.

When synthetic sediment barriers are used, remove and dispose of the sediment when deposits reach approximately ½ the height of the barrier.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

j. Temporary Sediment Basins. Before constructing a temporary sediment basin, clear the area of all vegetation. Construct the temporary sediment basin with a wide cross-section and a minimum grade, as shown in the Contract Documents. Dispose of excess excavated material.

Remove and dispose of the accumulated sediment when deposits reach approximately 20% of the basin capacity.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

k. Temporary Stream Crossing.

(1) General. When the Contractor's operations require a temporary stream crossing, and one is not shown in the Contract Documents, the Contractor may install the crossing at no cost to KDOT. Comply with all applicable rules and regulations, obtain all required permits and provide copies of all permits to the Field Engineer. An unanticipated stream crossing may require a permit from the Corps of Engineers if work is performed within Waters of the U.S. and/or a stream obstruction permit from the Kansas Department of Agriculture if the crossing is in a designated stream.

Before beginning work in the streambed, record existing stream channel elevations.

Construct temporary stream crossings as shown in the Contract Documents or the SWPPP.

Place 1 pipe buried 6 inches into the stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing. If the OHW is not designated in the Contract Documents, the Engineer will determine the OHW. The OHW means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Submit to the Engineer for review and approval, the design flow calculations to determine the number and diameter of pipes required. A minimum 12 inch diameter pipe is required.

Place pipes parallel to flow.

Cover pipes with a minimum of 12 inches of clean aggregate fill.

Dispose of sediment on the project at locations approved by the Engineer. When necessary, stabilize the material as directed by the Engineer.

(2) Maintenance. At a minimum, perform weekly inspections to verify that drift and debris are not blocking the flow of water through the pipes. Perform additional inspections, as needed. Remove drift and debris when blockage occurs. Repair eroded areas, if necessary, to prevent washout and allow passage of flows.

(3) Removal. Remove the temporary crossing and all materials as soon as no longer needed. Restore the disturbed bed and bank area of the stream channel to its pre-existing elevations.

l. Temporary Fertilizer, Seed and Mulch. Repair any rills, gullies or other erosion damage prior to seeding. Prepare the seedbed, fertilize, seed and mulch according to **DIVISION 900**. Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents. Apply water to seeded and mulched areas when approved by the Stormwater Compliance Engineer or Local Public Authority to promote the establishment of vegetation in critical areas.

m. Soil Erosion Mix. Prepare the seedbed, fertilize and seed according to **DIVISION 900**. Lightly hand rake broadcasted seed before placement of the erosion control.

Only use the soil erosion mix under Erosion Control (Class 1) or Erosion Control (Class 2).

There are no seasonal placement limitations for the soil erosion mix.

o. Erosion Control. After seeding and fertilizing according to **DIVISION 900**, install erosion control according to the manufacturer's requirements for edge and junction overlaps, staple size and staple pattern. Installation areas shall be free of erosion rills, rocks, clods or other debris that may cause "tenting" or otherwise inhibit uniform contact.

When shown in the plans, install erosion control materials within the time allowed for temporary stabilization under **subsection 901.3b**.

Use Erosion Control materials for the stabilization of all steep slopes (2 ½:1 or steeper) where construction activities have permanently or temporarily ceased and will not resume for a period exceeding 7 calendar days

(1) Areas with Erosion Control (Class 1). Place the Erosion Control (Class 1) on slopes according to the SWPPP. Do not mulch over the Erosion Control (Class 1).

(2) Areas with Erosion Control (Class 2). Place the Erosion Control (Class 2) in channels, ditches or areas of concentrated flow according to the SWPPP.

Do not cover erosion control materials with soil or mulch unless recommended by the manufacturer and approved by the Engineer.

Apply water to completed erosion control installations when approved by the Stormwater Compliance Engineer or Local Public Authority to promote the establishment of vegetation in critical areas.

p. Geotextile (Erosion Control). Install geotextile (erosion control) as a temporary measure to protect steep slopes and other areas where timely installation of the permanent (aggregate or concrete) slope protection is impractical. The installation area should be free of rills, rocks, clods or other debris. Secure geotextile to the ground with staples or other similarly effective methods to achieve uniform contact with minimal "tenting."

Remove geotextile prior to placement of the permanent slope protection.

Install geotextile (erosion control) as a temporary measure to protect temporary slopes, soil stockpiles and other areas where mulching or other means of stabilization is impractical. Preparation of the slopes and the method of securing the fabric shall be as approved by the Engineer.

q. Maintenance and Removal of Temporary Erosion and Pollution Control Devices. Maintain the effectiveness of the temporary erosion and pollution control devices as long as required to contain sediment runoff. Monitor temporary erosion and pollution control devices daily.

Remove the temporary devices according to the SWPPP or when directed by the Engineer. After removing the temporary erosion and pollution control devices, remove and dispose of the silt accumulation. Grade, fertilize, seed and mulch any bare areas.

When temporary erosion and pollution control devices are installed according to the Contract Documents, SWPPP, or as approved by the Engineer and such devices are no longer effective because of deterioration or functional incapacity, payment will be made for replacement of these devices, as directed by the Engineer. No payment will be made for replacing temporary erosion control devices that become ineffective because of improper installation, lack of maintenance or the Contractor's failure to pursue timely installation of permanent erosion control devices according to the Contract Documents.

902.4 MEASUREMENT AND PAYMENT

The Engineer will measure temporary berms, temporary slope drains, silt fence, biodegradable logs, synthetic sediment barriers, and filter sock by the linear foot. The Engineer will measure the top of the device from point to point or each bend/turn in the device, add them together from beginning to end to come up with the total liner feet per device. The length installed up side slopes beyond a point level from the top of the device in the ditch bottom will not be measured for payment.

The Engineer will measure temporary rock ditch checks by the cubic yard.

The Engineer will measure each temporary inlet sediment barrier.

The Engineer will measure each temporary stream crossing when shown as a bid item in the contract.

The Engineer will measure temporary sediment basins by the cubic yard excavated to construct the basin.

The Engineer will measure sediment removal by the cubic yard of sediment removed. If the quantity of sediment removal is approximately 50 cubic yards or greater in one location, the Engineer may pay for sediment removal by force account (**SECTION 109**) rather than paying the contract set price for the bid item ″Sediment Removal″. Whether paid as a set price or by force account, the Engineer will not pay for a quantity or cost that is incurred because of the Contractor's failure to install seed timely or failure to remove sediment timely as **SECTION 901** requires.

The Engineer will measure temporary fertilizer, temporary seed and soil erosion mix by the pound.

The Engineer will measure erosion control by the square yard.

The Engineer will measure mulching by the ton.

The Engineer will measure water used for establishment of vegetation by the M Gallon using calibrated tanks or meters.

The Engineer will measure geotextile (erosion control) by the square yard.

Payment for the various items of temporary erosion and pollution control is full compensation for the specified work. Contract unit prices will govern regardless of overruns or underruns of the estimated quantity unless specifically stated otherwise.

Payment for "Sediment Removal (Set Price)" at the contract set unit prices is full compensation for the specified work.

The Engineer will not measure for separate payment any erosion control devices or seeding installed in Contractor-Furnished borrows and waste locations or plant site locations outside the project limits.

SECTION 904
SEEDING

Page 900-13, delete subsection 904.3a and replace with the following:

a. Seeding Seasons.

(1) Projects less than 1 acre (bid item "Seeding" per lump sum). Seed the area anytime of the year with the seed specified in the Contract Documents.

(2) Projects 1 acre or greater (bid item "Seed (*)" or "(Hydro)(*)" per pound). Determine the seeding season using **TABLE 904-1**.

TABLE 904-1: GRASS & WILDFLOWER SEEDING SEASONS

Type	Season
Cool Season Grasses	February 15 thru April 20 August 15 thru September 30
Warm Season Grasses and Wildflowers	November 15 thru June 1

If cool season grasses are mixed with warm season grasses, seed the area during the seeding season for warm season grasses.

Seed the project during the proper seeding season to protect the finished grading. This may require seeding different parts of the project at different times or seasons. Complete permanent seeding during the first season after the grading work is finished. Complete the area once the seeding operations begin in an area.

The Environmental Scientist or Stormwater Compliance Engineer may extend the seeding season a few days in special situations depending on area and weather conditions.

Page 900-14, delete subsection 904.3e and replace with the following:

e. Seeding/Lump Sum. This item is only used on projects with less than 1 acre of seeding.

Prepare the seedbed, fertilize, seed and mulch all disturbed or cultivated areas within the right-of-way and construction easements according to **DIVISION 900**. This item includes all seeding and mulching necessary to meet stabilization requirements in **SECTION 901,** and includes both temporary and final surfaces. Multiple mobilizations may be required depending on how the Contractor pursues the work.

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Delete SECTION 1102, and replace with the following:

SECTION 1102

AGGREGATES FOR CONCRETE NOT PLACED ON GRADE

1102.1 DESCRIPTION

This specification is for coarse aggregates, intermediate aggregates, fine aggregates, mixed aggregates (coarse, intermediate and fine material) and miscellaneous aggregates for use in construction of concrete not placed on grade.

For Intermediate Aggregates and Mixed Aggregates, consider any aggregate with 30% or more retained on the No. 8 sieve to be Coarse Aggregate.

1102.2 REQUIREMENTS

a. Quality of Individual Aggregates.

(1) Provide Aggregates for Concrete that comply with **TABLE 1102-1**. Crushed Aggregates with less than 20% material retained on the 3/8" sieve must be produced from a source complying with these requirements prior to crushing. Fine Aggregates for Concrete have additional Quality Requirements stated in **subsection 1102.2e.(2).**

TABLE 1102-1: QUALITY REQUIREMENTS FOR CONCRETE AGGREGATES

Concrete Classification	Soundness (min.)	Wear (max.)	Absorption (max.)	Acid Insoluble[5] (min.)
Grade xx (AE)(SW)[1]	0.90	40	-	-
Grade xx (AE)(SA)[2]	0.90	40	2.0	-
Grade xx (AE)(AI)[3]	0.90	40	-	85
Grade xx (AE)(PB)[4]	0.90	40	3.0	-
Bridge Overlays	0.95	40	-	85
All Other Concrete	0.90	50	-	-

[1]Grade xx (AE)(SW) - Structural concrete with select coarse aggregate for wear.
[2]Grade xx (AE)(SA) - Structural concrete with select coarse aggregate for wear and absorption.
[3]Grade xx (AE)(AI) - Structural concrete with select coarse aggregate for wear and acid insolubility.
[4]Grade xx (AE)(PB) - Structural concrete with select aggregate for use in prestressed concrete beams.
[5]Acid Insoluble requirement does not apply to calcite cemented sandstone.

- Soundness (KTMR-21) requirements do not apply to aggregates having less than 10% material retained on the No. 4 sieve.
- Wear (AASHTO T 96) requirements do not apply to aggregates having less than 10% retained on the No. 8 sieve.
- Absorption KT-6 Procedure I for material retained on the No. 4 sieve. Apply the maximum absorption to the portion retained on the No. 4 sieve.

(2) To prevent Alkali Silica Reactions (ASR) all predominately siliceous aggregate must comply with the Wetting & Drying Test requirements or be used with a Coarse Aggregate Sweetener per **TABLE 1102-2**, or will require Supplemental Cementitious Materials (SCM). If using SCM's meet the requirements of **subsection 401.3j.**

Wetting & Drying Test of Siliceous Aggregate for Concrete (KTMR-23)
Concrete Modulus of Rupture:

- At 60 days, minimum ..... 550 psi
- At 365 days, minimum ..... 550 psi

Expansion:

- At 180 days, maximum 0.050%
- At 365 days, maximum 0.070%

Aggregates produced from the following general areas are exempt from the Wetting and Drying Test:

- Blue River Drainage Area.
- The Arkansas River from Sterling, west to the Colorado state line.
- The Neosho River from Emporia to the Oklahoma state line.

(3) Coarse Aggregate Sweetener. Types and proportions of aggregate sweeteners to be used with Mixed Aggregates are listed in **TABLE 1102-2**.

TABLE 1102-2: COARSE AGGREGATE SWEETENER

Type of Coarse Aggregate Sweetener	Proportion Required by Percent Weight
Crushed Sandstone*	40 (minimum)
Crushed Limestone or Dolomite*	40 (minimum)
Siliceous Aggregates meeting **subsection 1102.2a.(2)**	40 (minimum)
Siliceous Aggregates not meeting **subsection 1102.2a.(2)** **	30 (maximum)

*Waive the minimum portion of Coarse Aggregate Sweetener for all intermediate and fine aggregates that comply with the wetting and drying requirements for Siliceous Aggregates.

To be used only with intermediate and fine aggregates that comply with the wetting and drying requirements of Siliceous Aggregates. If none of the aggregates comply with the wetting and drying requirements of Siliceous Aggregates, or Coarse Aggregate Sweeteners do not comply with **TABLE 1102-2, then the mix must contain Supplemental Cementitious Material(s); and meet the requirements of **subsection 401.3j.**

(4) Deleterious Material. Maximum allowed deleterious substances by weight are:

- Clay lumps and friable particles (KT-7) 1.0%
- Coal (AASHTO T 113) 0.5%
- Shale or Shale-like material (KT-8) 0.5%
- Sticks (wet) (KT-35) 0.1%
- Total allowable deleterious 1.5%

b. Mixed Aggregates.

(1) Composition. Provide coarse, intermediate, and fine aggregates in a combination necessary to meet **subsection 1102.2b.(2)**. Use a proven optimization method such as ACI 302.1 or other method approved by the Engineer. Aggregates may be from a single source or combination of sources.

(2) Product Control.

(a) Gradations such as those shown in **TABLE 1102-3** have proven satisfactory in reducing water demand while providing good workability. Adjust mixture proportions whenever individual aggregate grading varies during the course of the work. Use the gradations shown in **TABLE 1102-3**, or other gradation approved by the Engineer.

Optimization is not required for Commercial Grade Concrete. The Engineer may waive the optimization requirements if the concrete meets all the requirements of **DIVISION 400**.

Follow these guidelines:

1. Do not permit the percent retained on two adjacent sieve sizes to fall below 4%;

2. Do not allow the percent retained on three adjacent sieve sizes to fall below 8%; and

3. When the percent retained on each of two adjacent sieve sizes is less than 8%, the total percent retained on either of these sieves and the adjacent outside sieve should be at least 13%. (for example, if both the No. 4 and No. 8 sieves have 6% retained on each, then:

1) the total retained on the 3/8 in. and No. 4 sieves should be at least 13%, and

2) the total retained on the No. 8 and No. 16 sieves should be at least 13%.)

TABLE 1102-3: ALLOWABLE GRADING FOR MIXED AGGREGATES FOR CONCRETE													
Type	**Usage**	**Percent Retained - Square Mesh Sieves**											
		1 ½"	**1"**	**¾"**	**½"**	**⅜"**	**No. 4**	**No. 8**	**No. 16**	**No. 30**	**No. 50**	**No. 100**	**No. 200**
MA-3	Optimized All Concrete		0	2-12	Note[1]	Note[1]	Note[1]	Note[1]	Note[2]	Note[2]	Note[2]	95-100[3]	98-100[4]
MA-4	Optimized All Concrete	0	2-12	Note[1]	Note[1]	Note[1]	Note[1]	Note[1]	Note[2]	Note[2]	Note[2]	95-100[3]	98-100[4]
MA-5	Optimized All Concrete		0	2-12	8 min	22-34		55-65		75 min		95-100	98-100
MA-6	Optimized for Bridge Overlays		0	0	2-12	Note[1]	Note[1]	Note[1]	Note[2]	Note[2]	Note[2]	95-100[3]	98-100[4]
MA-7	Contractor Design KDOT Approved[5]	±2	±2	±6	±6	±6	±5	±5	±4	±4	±4	95-100	98-100

[1]Retain a maximum of 22% (24% for MA-6) and a minimum of 6% of the material on each individual sieve.
[2]Retain a maximum of 15% and a minimum of 6% of the material on each individual sieve.
[3]Retain a maximum of 7% on the No. 100 sieve.
[4]Retain a maximum of 2% on the No. 200 sieve.
[5]Tolerances from approved mix design gradation.

(b) Optimization Requirements for all Gradations, except MA-7.
- Actual Workability must be within ± 5 of Target Workability.

Where: W_A = Actual Workability
W_T = Target Workability
CF = Coarseness Factor

1. Determine the Grading according to KT-2
2. Calculate the Coarseness Factor (CF) to the nearest whole number.

$$CF = \frac{+3/8\text{" Material \% Retained}}{+\#8\text{ Material \% Retained}} \text{x}100$$

3. Calculate the Actual Workability (W_A) to the nearest whole number as the percent material passing the #8 sieve.

$$W_A = 100 - \%\text{ retained on \#8 sieve}$$

4. Calculate the Target Workability (W_T) to the nearest whole number where
For 517 lbs cement per cubic yard of concrete

$$W_T = 46.14 - (CF/6)$$

For each additional 1 lb of cement per cubic yard, subtract 2.5/94 from the Target Workability.

Maintain an Actual Workability within ± 5 of the Target Workability for the combined aggregate.

(c) Deleterious Substances. **Subsection 1102.2a.(4),** as applicable.
(d) Uniformity of Supply. Designate or determine the fineness modulus (grading factor) for each aggregate according to the procedure listed Part V, Section 5.10.5-Fineness Modulus of Aggregates (Gradation Factor) before delivery, or from the first 10 samples tested and accepted. Provide aggregate that is within ±0.20 of the average fineness modulus.
Provide a single point grading for the combined aggregates along with a plus/minus tolerance for each sieve. Use plus/minus tolerances to perform quality control checks and by the Engineer to perform aggregate grading verification testing. The tests may be performed on the combined materials or on individual aggregates, and then theoretically combined to determine compliance.

(3) Handling of All Aggregates.

(a) Segregation. Before acceptance testing, remix all aggregate segregated by transit or stockpiling.
(b) Stockpiling.

- Maintain separation between aggregates from different sources, with different gradings or with a significantly different specific gravity.
- Transport aggregate in a manner that promotes uniform grading.
- Do not use aggregates that have become mixed with earth or foreign material.
- Stockpile or bin all washed aggregate produced or handled by hydraulic methods for 12 hours (minimum) before batching. Rail shipment exceeding 12 hours is acceptable for binning provided the car bodies permit free drainage.
- Provide additional stockpiling or binning in cases of high or non-uniform moisture.
- Stockpile accepted aggregates in layers 3 to 5 feet thick. Berm each layer so that aggregates do not "cone" down into lower layers.

c. Coarse Aggregates for Concrete.

(1) Composition. Provide coarse aggregate that is crushed or uncrushed gravel or crushed stone meeting the quality requirements of **subsection 1102.2a.** Consider limestone, calcite cemented sandstone, rhyolite, quartzite, basalt and granite as crushed stone.

Mixtures utilizing siliceous aggregate not meeting **subsection 1102.2a.(2)** may require supplemental cementitious materials to prevent Alkali Silica Reactions. Provide the results of mortar expansion tests of ASTM C 1567 using the project's mix design concrete materials at their designated percentages. Provide a mix with a maximum expansion of 0.10% at 16 days after casting. Provide the results to the Engineer at least 15 days before placement of concrete on the project.

(2) Product Control. Use gradations such as those in **TABLE 1102-4** which have been shown to work in Optimized Mixed Aggregates, or some other gradation approved by the Engineer that will provide a combined aggregate gradation meeting **subsection 1102.2b.**

(3) Deleterious Substances. **Subsection 1102.2a.(4),** as applicable.

TABLE 1102-4: ALLOWABLE GRADING FOR COARSE AGGREGATES

Type	Composition	Percent Retained - Square Mesh Sieves							
		1½"	1"	¾"	½"	⅜"	No. 4	No. 8	No. 200
SCA-1	Siliceous Gravel or Crushed Stone	0	0-10	14-35	-	50-75	-	95-100	98-100
SCA-2	Siliceous Gravel or Crushed Stone			0	0-35	30-70	75-100	95-100	98-100
SCA-4	Siliceous Gravel or Crushed Stone		0	0-20				95-100	98-100

d. Intermediate Aggregate for Concrete.

(1) Composition. Provide intermediate aggregate for mixed aggregates (IMA) that is crushed stone, natural occurring sand, or manufactured sand meeting the quality requirements of **subsection 1102.2a.**

(2) Product Control. Provide IMA grading when necessary to provide a combined aggregate gradation meeting **subsection 1102.2b.**

(3) Deleterious Substances. **Subsection 1102.2a.(4),** as applicable.

(4) Organic Impurities (AASHTO T 21). The color of the supernatant liquid is equal to or lighter than the reference standard solution.

e. Fine Aggregates for Concrete.

(1) Composition.

(a) Type FA-A. Provide either singly or in combination natural occurring sand resulting from the disintegration of siliceous or calcareous rock, or manufactured sand produced by crushing predominately siliceous materials meeting the quality requirements of **subsection 1102.2a.** and **1102.2e.(2)**.

(b) Type FA-C. Provide crushed siliceous aggregate, steel slag, or chat that is free of dirt, clay, and foreign or organic material.

(2) Additional Quality Requirements for FA-A.

(a) Mortar strength and Organic Impurities. If the DME determines it is necessary, because of unknown characteristics of new sources or changes in existing sources, provide fine aggregates that comply with the following:

- Mortar Strength (KTMR-26). Compressive strength when combined with Type III (high early strength) cement:
  - At age 24 hours, minimum 100%*
  - At age 72 hours, minimum 100%*

  *Compared to strengths of specimens of the same proportions, consistency, cement and standard 20-30 Ottawa sand.
- Organic Impurities (AASHTO T 21). The color of the supernatant liquid is equal to or lighter than the reference standard solution.

(b) Provide FA-C for Multi/Single-Layer and Slurry Polymer Concrete Overlay complying with **TABLE 1102-5**. Provide FA-F for High Friction Surface complying with **TABLE 1102-5**.

TABLE 1102-5: QUALITY REQUIREMENTS FOR MULTI/SINGLE-LAYER AND SLURRY POLYMER CONCRETE OVERLAY

Property	Requirement	Test Method
Soundness, minimum	0.92	KTMR-21
Wear, maximum	30%	AASHTO T 96
Acid Insoluble Residue, minimum	55%	KTMR-28
Uncompacted Voids Fine Aggregate, minimum	45	KT-50
Moisture Content, maximum	0.2%	KT-11

(3) Product Control.

(a) Size Requirements. Provide FA-C for Multi/Single-Layer and Slurry Polymer Concrete Overlays complying with **TABLE 1102-6**. Provide FA-F for High Friction Surface complying with **TABLE 1102-6.** Provide FA-A that comply with **TABLE 1102-6** or some other gradation approved by the Engineer that will provide a combined aggregate gradation meeting **subsection 1102.2.b.**

TABLE 1102-6: GRADING REQUIREMENTS FOR FINE AGGREGATES FOR CONCRETE

Type	Percent Retained-Square Mesh Sieves							
	⅜"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
FA-A	0	0-10	0-27	15-55	40-77	70-93	90-100	98-100
FA-C	0	0	25-70	95-100	98-100	98-100	98-100	98-100
FA-F	0	0	0-15	95-100	98-100	98-100	98-100	98-100

(b) Deleterious Substances.

- Maximum allowed deleterious substances by weight are :
  - Coal (AASHTO T113) …… 0.5%
  - Sticks (wet) (KT-35) …… 0.1%
  - Sum of all deleterious ……0.5%

f. Miscellaneous Aggregates for Concrete.

(1) Aggregates for Mortar Sand, Type FA-M.

(a) Composition. Provide aggregates for mortar sand, Type FA-M that is natural occurring sand.

(b) Quality.

- Mortar strength and Organic Impurities. If the DME determines it is necessary, because of unknown characteristics of new sources or changes in existing sources, provide aggregates for mortar sand, Type FA-M that comply with the following:
  - Mortar Strength (KTMR-26). Compressive strength when combined with Type III (high early strength) cement:
    - At age 24 hours, minimum 100%*

- At age 72 hours, minimum 100%*

* Compared to strengths of specimens of the same proportions, consistency, cement and standard 20-30 Ottawa sand.

- Organic Impurities (AASHTO T 21). The color of the supernatant liquid is equal to or lighter than the reference standard solution.

(c) Product Control.

- Size Requirements. Provide aggregates for mortar sand, Type FA-M that comply with **TABLE 1102-7**.

TABLE 1102-7: GRADING REQUIREMENTS FOR MORTAR SAND

Type	Percent Retained - Square Mesh Sieves							Gradation Factor
	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
FA-M	0	0-2	0-30	20-50	50-75	90-100	98-100	1.70-2.50

- Deleterious Substances. **Subsection 1102.2a.(4),** as applicable.

(2) Lightweight Aggregate.

(a) Composition. Provide a lightweight aggregate consisting of expanded shale, clay or slate produced from a uniform deposit of raw material.

(b) Quality.

- Soundness, minimum (KTMR-21) 0.90
- Loss on Ignition 5%

(c) Product Control.

- Size Requirements. Use gradations such as those in **TABLES 1102-4** and **1102-6** which have been shown to work in Optimized Mixed Aggregates, or some other gradation approved by the Engineer that will provide a combined aggregate gradation meeting **subsection 1102.2b**.
- Deleterious Substances. **Section 1102.2a.(4)** as applicable.
- Organic Impurities (AASHTO T 21). The color of the supernatant liquid is equal to or lighter than the reference standard solution.
- Unit Weight (dry, loose weight) (max.) ..... 1890 lbs/cu yd

(d) Concrete Making Properties. Drying shrinkage of concrete specimens prepared with lightweight aggregate proportioned as shown in the Contract Documents cannot exceed 0.07%.

(e) Uniformity of Supply. Designate or determine the fineness modulus (grading factor) according to procedure listed in Part V, Section 5.10.5-Fineness Modulus of Aggregates (Gradation Factor) before delivery, or from the first 10 samples tested and accepted. Provide aggregate that is within ±0.20 of the average fineness modulus.

(f) Proportioning Materials. Submit mix designs for concrete using lightweight aggregate to Construction and Materials for approval prior to use.

(g) Stockpile accepted aggregates in layers 3 to 5 feet thick. Berm each layer so that aggregates do not "cone" down into lower layers.

1102.3 TEST METHODS

Test aggregates according to the applicable provisions of **SECTION 1115**.

1102.4 PREQUALIFICATION

Aggregates for concrete must be prequalified according to **subsection 1101.4**.

1102.5 BASIS OF ACCEPTANCE

The Engineer will accept aggregates for concrete based on the prequalification required by this specification and **subsection 1101.5**.

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

SECTION 1404

LIQUID MEMBRANE FORMING COMPOUNDS

1404.1 DESCRIPTION

This specification covers liquid membrane forming compounds (also referred to as concrete curing compounds) suitable for spraying on horizontal and vertical concrete surfaces to retard the loss of water during the early hardening period and subsequent curing period.

1404.2 REQUIREMENTS

a. Provide liquid membrane forming compound that complies with ASTM C 309 for Type 1-D, clear or translucent with fugitive dye, or Type 2, white pigmented compound.

b. Type 2 white pigmented compound will be further classified into Type 2 (Wax Based) and Type 2 (Other). This is to allow specifying of wax-based compound for certain applications where a bond breaker is desired. Either formulation base may be supplied except when wax based is specified.

c. Do not allow water-emulsion based material to freeze. Material that has been subjected to freezing temperatures will be rejected.

1404.3 TEST METHODS

Test materials in accordance with ASTM C 309. Fingerprinting and screening of verification samples by infrared spectroscopy is done according to ASTM E 1252.

Water emulsion-based material is not subject to the long-term settling test by the freeze thaw cycling method.

Wax-based material for Cement Treated Base (CTB) with the following exceptions:

Moisture Loss, kg/sq m (max.).....0.60
Daylight Reflectance (min.) 50%

1404.4 PREQUALIFICATION

Submit two 1-quart samples of material and a copy of the manufacturer's test results on samples of the same lot of material to the Engineer of Tests. Include a copy of the Material Safety Data Sheet (MSDS). For Type 2 white pigmented compounds, include a statement regarding whether the formulation is wax based or other, unless it is specifically addressed in the MSDS.

Samples will be tested for compliance with this specification. The manufacturer will be notified of the test results on the samples submitted.

Results of tests from the AASHTO National Transportation Product Evaluation Program (NTPEP) will be accepted in lieu of the sample requested above. Include the most recent NTPEP test report along with the other documentation requested. Include evidence that the product being offered is identical to the one reported in the NTPEP report.

Manufacturers whose products comply with this specification will be placed on a prequalified list. Manufacturers will remain on the list as long as the results of verification samples and performance in the field are satisfactory. Any changes in formulation will require re-submittal for prequalification testing.

Effective March 1, 2020, all liquid membrane forming compounds must be listed with the NTPEP. To be NTPEP listed by March 1, 2020, product testing must have occurred in 2017, 2018, or 2019. Retesting every three years as detailed in the NTPEP Concrete Curing Compounds (CCC) work plan is required to maintain prequalification. Failure to retest and a consequent removal from the NTPEP website will result in the product's removal from the list of

prequalified products. Follow the instructions on the NTPEP's website (www.ntpep.org) to participate in the CCC evaluation program.

1404.5 BASIS OF ACCEPTANCE

a. Prequalification as required by **subsection 1404.4** above.

b. Receipt and approval of a Type C certification as specified in **DIVISION 2600**.

09-25-18 C&M (CFN)
Feb-19 Letting

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 2001 and replace with the following:

SECTION 2001

PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENT

2001.1 DESCRIPTION

This specification governs the requirements for portland and blended hydraulic cement utilized in the production of concrete.

2001.2 REQUIREMENTS

a. General. Cement types are to be designated according to the classifications of AASHTO M 85 for portland and AASHTO M 240 for blended cement.

Utilize Type I, IL(x), IP(x), IS(x), IT(Ax)(By), II(MH) or III cement as allowed in **SECTION 401**. The "x" and "y" in the previous sentence equals the targeted percentage of limestone, pozzolan or slag cement in the product expressed as a whole number by mass of final blended product. Likewise, "A" and "B" are either "L" for limestone, "P" for pozzolan or "S" for slag cement with "A" being the larger material by mass and "B" the smaller. If the "x" and "y" are equal, list "A" and "B" alphabetically.

A cement type and source must be prequalified before it can be utilized in KDOT projects.

Cements of differing types and or sources cannot be intermixed within any singular component of a structure.

A contractor must have moisture protective facilities to store the cement required for 3 active construction days. The Engineer's representative may waive this requirement if it is determined that a well-regulated supply from the cement producer can be maintained. Any cement that has been contaminated by moisture or reclaimed by any method is not acceptable.

Previously approved cement bulk stored at the source plant or terminal for over 6 months or in bulk or packaged and stored at a contractor or distributor facility for over 3 months after the initial test date is subject to re-sampling, testing, and the requirements of this subsection.

Cement stored at facilities, other than those described in the preceding paragraphs, before the initiation of construction or delivered to such facilities during construction of KDOT projects is to be sampled and tested and is subject to the requirements of this Section. This requirement may be waived if certifications documenting that the cement is a prequalified type from a prequalified source are provided to the Engineer's representative.

b. Portland Cement. Provide Type I, Type II(MH), and Type III portland cement that comply with all applicable requirements (including the optional chemical and physical requirements, annexes, and appendices) of AASHTO M 85, except as modified by the following:

(1) The time of setting may be determined by use of the Gillmore needles method (AASHTO T 154), or the Vicat needle method (AASHTO T 131). Identify which method is being used on the report. KDOT will test using the Vicat method.

(2) Optimized SO_3 – Provide supporting expansion data whenever SO_3 results exceed the requirements stated in AASHTO M 85, Table 1, footnote d applies.

(3) If processing additions are used, report the percentage, composition, and the source of the additions in writing to KDOT.

(4) Heat of hydration requirements as stated in AASHTO M 85, Table 4 will not be enforced.

c. Blended Hydraulic Cement. Supply blended hydraulic cements Type IL(x), IP(x), Type IS(x) and Type IT(Ax)(By) that comply with AASHTO M 240 except as modified by the following:

(1) Provide the following in written statements:

(a) The specific proportions and materials being blended to produce the blended hydraulic cement.

(b) That the amount of pozzolan (except silica fume) or slag cement in the finished cement will not vary more than ± 5.0% by mass of the finished cement from lot to lot or within a lot.

(c) That the amount of silica fume or limestone in the finished cement will not vary more than ±2.5% by mass of the finished cement from lot to lot or within a lot.

(2) Report the amount retained on the No. 325 sieve, and the fineness by the air permeability method in accordance with the procedures specified in ASTM C 204 at the time of shipment.

(3) Mortar expansion of the finished cement must be within the limits included in Table 2 of AASHTO M 240 or the job specific mixture requirements in **subsection 2001.2d.(1)(d).**

(4) The equivalent alkalis, as defined in Table 1 of AASHTO M 85, may not exceed 1.5% in any application. For prequalification, or to increase the equivalent alkalis above current production levels, submit results from ASTM C441 testing showing mortar expansion within 0.020 at age 14 days, max percent and 0.060 at age 56 days, max percent, for the maximum equivalent alkalis level intended for production. Submit a sample to the Engineer of Tests for verification testing. Monthly quality control test reports will be monitored to verify the equivalent alkalis level of regular production remains below this maximum level. If production at a higher level is desired, complete requalification which establishes a new maximum limit will be required.

d. Field Blended Cements.

(1) Cements for use in concrete that are blended in the field by substituting any pozzolan or slag cement for portland cement whether in the mixer or otherwise, must comply with the following:

(a) Provide a written statement specifying the proportions and materials being blended to produce the total cementitious content, and that the amount of pozzolan or slag cement will not vary more than ± 1.0% by weight of the total cement from batch to batch.

(b) Use portland cement or blended hydraulic cement from sources prequalified under this specification.

(c) Use pozzolan or slag cement from approved or prequalified sources.

(d) Test and provide project mix design results complying with **SECTION 401**.

(e) Concrete made with these mixtures is subject to strength and other requirements detailed in other parts of the specifications.

(2) Silica fume, which is specified elsewhere, is excluded from the requirements in **subsection 2001.2d.(1)**.

(3) Refer to **SECTION 401** for more specific information regarding the substitution of any pozzolan or slag cement for portland cement as a field blended cement.

2001.3 TEST METHODS

Conduct all tests required by the applicable AASHTO, ASTM or other specifications of **subsection 2001.2** according to the procedures specified in that standard. Field sample cement in accordance with the procedures of Part V, KT-29. Obtain all other cement samples in accordance with the requirements and procedures of ASTM C183.

2001.4 PREQUALIFICATION

a. Becoming Prequalified.

(1) Submit the following to the Engineer of Tests:

(a) A copy of the quality control plan for the source. The plan should include information on what cement types are produced, where and how sampling is done, frequency, and what standards (AASHTO, ASTM, etc.) are applied.

(b) A 2-gallon sample of each cement type produced by the source and permitted through this Section that is representative of the product intended for use on KDOT projects.

(c) Certified quality control test results of cement, by type, that was produced by the source during the 6 months immediately before the prequalification request. Provide the high, low and average values or statistical analysis for each month. Include applicable statements and test reporting as described in **subsections 2001.2b.** or **2001.2c**. If no processing additions were used during the previous 6 month reporting period, report this fact also.

(d) Documentation of the source nominal cement production levels, by quantity of each type produced, for the 6 months preceding the prequalification request.

(e) Documentation of routine Cement and Concrete Reference Laboratory (CCRL) inspection of the source laboratory performing the cement quality control testing. Include the results of the most recent evaluation.
(f) The names of the individuals responsible for the quality control for cement production at the source.

(2) Prequalification of a cement source, by type, will be based on cement produced when the source is utilizing specific materials, equipment and processes. Any change in materials, materials sources, equipment or processes voids the source prequalification, and a new prequalification will be required.

b. Maintaining Prequalified Status. After a cement source has acquired prequalified status, the source will be permitted to provide cement, by prequalified type, for use on KDOT projects provided the following conditions are complied with:

(1) The quality-monitoring program meets the minimum sampling and testing frequencies established in ASTM C 183. This frequency may be altered somewhat with the approval of the Bureau Chief, Construction and Materials.

(2) Submit monthly quality control reports for all prequalified cement types within 2 weeks after completion of the testing. Include applicable statements and test reporting as described in **subsections 2001.2b. or c.** If no processing additions were used for cement produced during the month, report that fact also for each product.

(3) Utilize an approved laboratory to conduct quality control tests. The laboratory will be considered approved if it is properly equipped, has the capabilities to perform the tests required through this subsection and is routinely inspected through the CCRL program. Continued approval of the control laboratory and the source, by cement type, will depend on satisfactory comparison of its test results with the results obtained by the Materials and Research Center on random verification samples of cement produced by the source.

(4) The source has not changed materials, material sources, equipment, or processes since prequalification.

2001.5 BASIS OF ACCEPTANCE

a. Prequalification as specified in **subsection 2001.4**.

b. A proper certification must accompany each shipment of cement. Provide a copy of the bill of lading which includes the following certification statement and the signature of a responsible source representative to the Field Engineer responsible for the project.

Certification Statement

The material herein has been sampled and tested as prescribed by KDOT and complies with the applicable specification requirements for Type __ cement (or blended cement) in accordance with the requirements of AASHTO_____.

Date_____ Signed_____

If a processing addition is used in the manufacture of the cement, include the following as a part of the certification statement:

A processing addition, consisting of __% of _____ and complying with the requirements of AASHTO M 85, has been used in the manufacture of this cement.

c. Identify the bills of lading with a project number, and denote the cement source, the type, and the quantity in the shipment. Retain this copy at the project or Contractor or distributor facility for the Engineer's representative's records.

d. In the case of more than one project being supplied by a contractor or distributor facility, the facility must provide the Engineer's representative either a copy of the bill of lading, or a signed listing of the bills of lading representing the cement, by type and source, incorporated into each project.

Note: Verification samples will be obtained by KDOT personnel at the project site. Test results that do not comply with the specifications of this subsection may be considered sufficient cause to rescind approval to furnish cement, by type, on a certification basis.

10-12-20 C&M (CL)
Mar-2021 Letting

KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2015 EDITION

Delete SECTION 2007 and replace with the following:

SECTION 2007

SLAG CEMENT FOR USE IN CONCRETE AND MORTARS

2007.1 DESCRIPTION

This specification covers slag cement for use in concrete and mortars.

2007.2 REQUIREMENTS

Provide material that complies with the requirements of ASTM C 989, "Slag Cement for Use in Concrete and Mortars."

2007.3 TEST METHODS

As specified in ASTM C 989.

2007.4 PREQUALIFICATION

a. Manufacturers desiring to provide material under this specification are to submit the following to the Engineer of Tests:

(1) A 2-gallon prequalification sample of each product they wish to prequalify.

(2) Complete instructions on the use of the material and a Safety Data Sheet (SDS).

(3) Copies of quality control test reports for the 6 months prior to the date of submittal to substantiate a history of satisfactory quality control. Also, provide evidence that the quality control laboratory is accredited by a national accrediting body, such as AASHTO Resource, and regularly inspected receiving satisfactory ratings by the Cement and Concrete Reference Laboratory (CCRL).

b. If the prequalification samples comply with the requirements of **subsection 2007.2**, and the other submittals are satisfactory, the name of the product will be placed on a list of prequalified products maintained by the Bureau of Construction and Materials.

c. Semi-annual results of the producer's quality control testing, as defined above, are required to be forwarded to the Bureau of Construction and Materials to maintain status on the prequalified list. A prequalified plant will retain its prequalified status as long as test results of verification samples obtained by KDOT and quality control test results obtained by the producer indicate that the plant is exercising acceptable quality control.

d. A terminal established by a prequalified plant will be considered prequalified to supply slag cement under this specification.

2007.5 BASIS OF ACCEPTANCE

a. Prequalification as required by **subsection 2007.4**.

b. Receipt and approval of a Type C certification as specified in **DIVISION 2600.**

c. Verification samples will be taken by each District, at the rate of one per year, for each slag producer supplying material to that District's projects.

DOCUMENT 830
SUBMITTAL CONTROL SHEET

Project: SW 107th Street over Elm Run/OSN 332 Project Manager:

Project No.: S-121045.00 Contractor:

☑ Section No.	Specifications Section Title	Samples	Shop Dwgs.	Matl. Or Parts List	Descriptive Data	Mfrgs Literature	Mix Designs	Certifications	Operation Instr.	Tests	Date of Submittal	Date Rejected	Date Revise & Resubmit	Date Make Corrections Noted	Date No Exceptions Taken	Notes
1	Progress Schedule				X											
1	Demolition Plan				X											
5	Portland Cement							X								
5	Aggregates-Fine							X		X						
5	Aggregates-Coarse							X		X						
5	Water															
5	Admixtures - Air Entrainment							X								
5	Admixtures - Water Reducers							X								
5	Reinforcing Steel (Gr.60)							X		X						
5	Welded Steel Wire Mesh							X								
5	Liquid Membrane Curing Membrane							X								
2	Backfill Material				X					X						Standard Proctor
2	Supplementary Borrow Material															Standard Proctor
4	Seed							X								
4	Fertilizer							X								
SS	Traffic Control Devices			X				X								
SS	Concrete Grade 4.0 (AE)						X									

Note: Contractor shall furnish all specified submittal's indicated on the Submittal Control Sheet.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	1	45

STATE OF KANSAS

SHAWNEE COUNTY PROJECT NO. S–121045.00

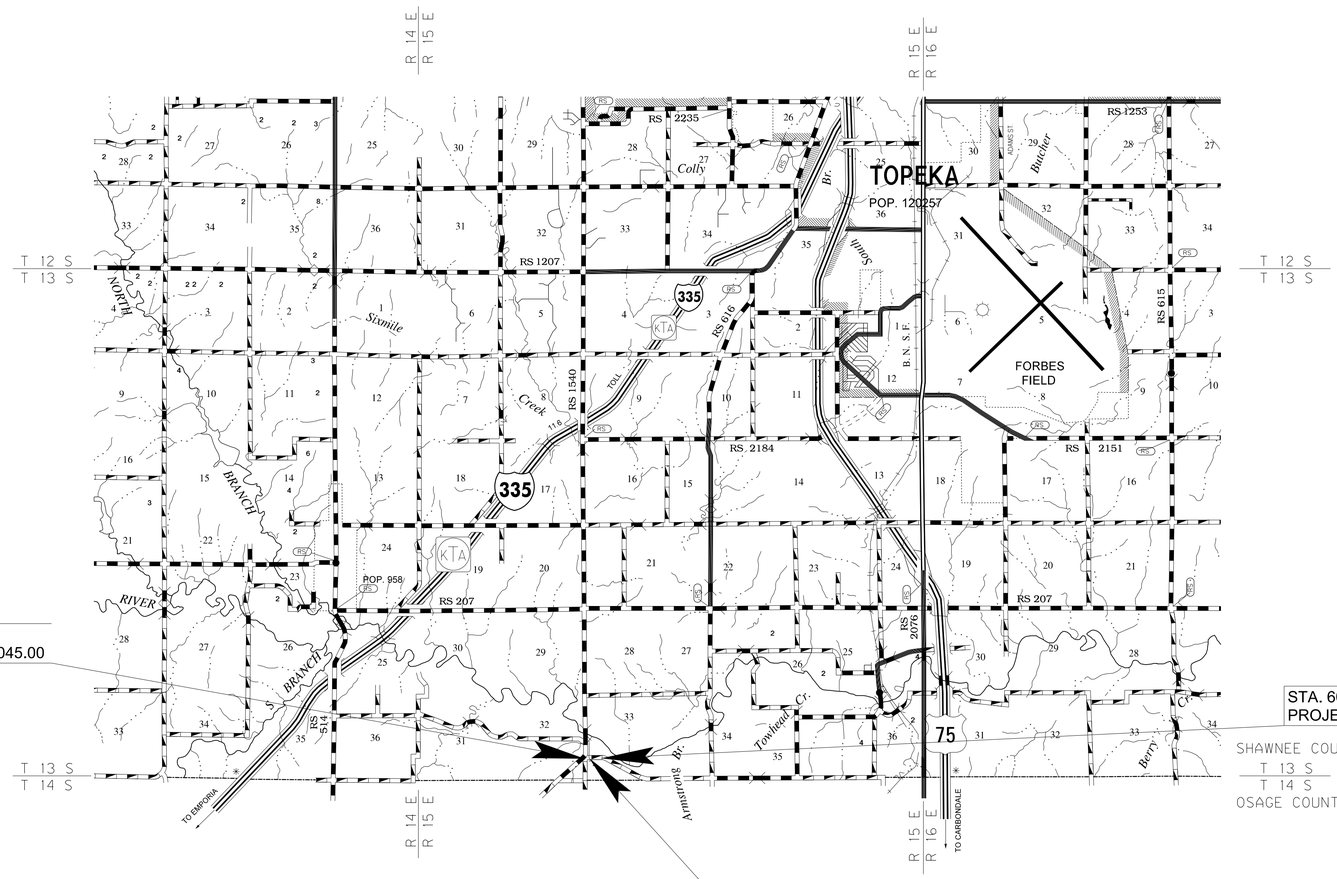
SW 107TH STREET OVER ELM RUN CREEK

50 VEHICLES PER DAY
DESIGN SPEED 30 MPH

PROJ. NO. S–121045.00

GRADING
SURFACING
BRIDGE
SEEDING

INDEX OF SHEETS



STA. 53+50, BEGIN
PROJECT NO. S-121045.00

STA. 60+25 END
PROJECT NO. S-121045.00

Sta. 17+07.55 CONSTRUCT
Br. No. OSN 332
3-14'x9'x52'-3" Reinforced Concrete Box(RFB)
24'-0" Roadway, Rotate 2° Rt.

1 0 1 2
SCALE IN MILES

NOTE: ROAD TO BE CLOSED TO TRAFFIC DURING CONSTRUCTION.

CONVENTIONAL SIGNS

COUNTY LINE		CENTER LINE OF PROJECT	5+00 6
CITY LIMITS		TERRACE	
STATE OR NATIONAL LINE		CULVERTS	
TOWNSHIP, SECTION or GRANT LINE		DROP INLET & STORM SEWER	
PROPERTY LINE		ACCESS CONTROL	
HIGHWAY FENCE		POWER POLE	
EXISTING FENCE		TELEPHONE POLE	
GUARD FENCE		MARSH	
CONSTRUCTION LIMITS		HEDGE	
RIGHT OF WAY LINE		TREES	
TRAVELED WAY		PROFILE ELEVATION	1172.18 +503
RAILROADS		STREAM or CREEK	

GROSS LENGTH OF PROJECT	675 ft	
EXCEPTIONS	0 ft	
NET LENGTH OF PROJECT	675.00 ft	0.128 miles
NET LENGTH OF BRIDGES	45.00 ft	0.009 miles
NET LENGTH OF ROAD	675.00 ft	0.128 miles

PLANS PREPARED BY

FINNEY & TURNIPSEED
TRANSPORTATION AND CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

TIMOTHY A. REED LICENSED 15024 8-4-23 KANSAS PROFESSIONAL ENGINEER

RELEASED FOR CONSTRUCTION	DATE: 8/4/2023
for DIRECTOR OF PUBLIC WORKS SHAWNEE COUNTY	M. Walsh, P.E.

DATE	BY
	Finney & Turnipseed, T. Reed
	Finney & Turnipseed
	Finney & Turnipseed, TAR, CAM

SURVEY
CADD TECHNICIAN
DESIGNERS
SQUAD

8/4/2023
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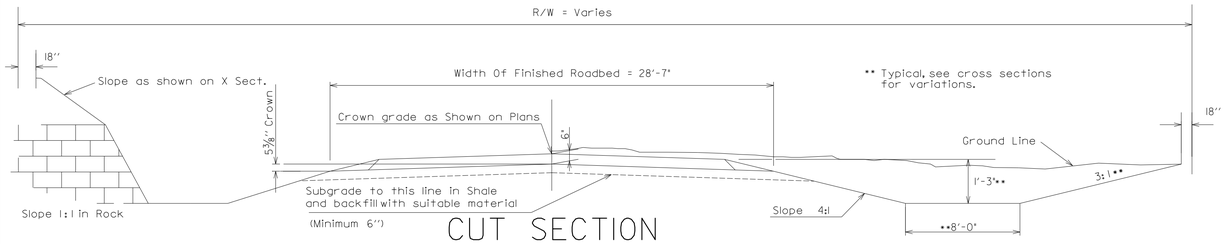
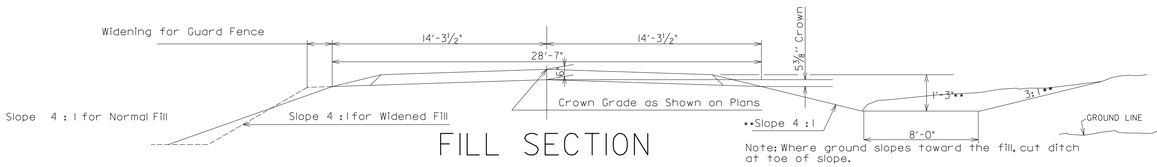
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	2	45



CUT SECTION

NOTE: For overbreakage in limestone, sandstone or shale see Special Provisions



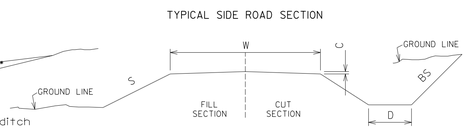
FILL SECTION

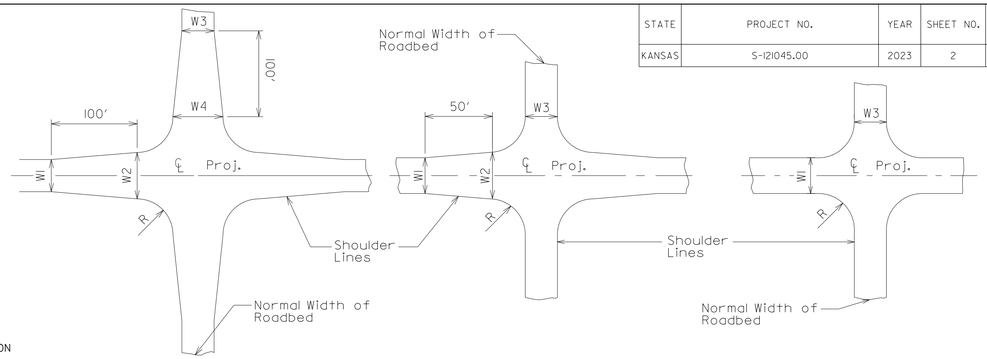
Shoulder Slopes at ends of Guard Fence should be no steeper than 3 : 1.

When fill exceeds 6' Shoulder Slopes may be steepened

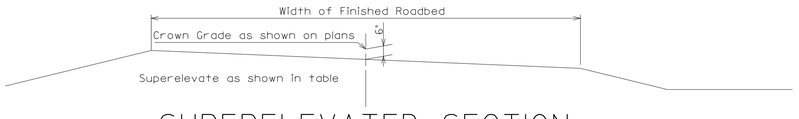
Note: Where ground slopes toward the fill, cut ditch at toe of slope.

TYPICAL SIDE ROAD SECTION

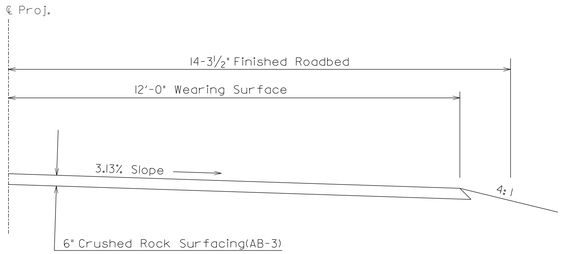




TYPICAL INTERSECTION DETAILS



SUPERELEVATED SECTION

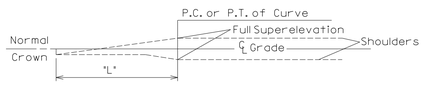


TYPICAL 1/2 SECTION SURFACING

Mainline(107th) and Side Road(Wanamaker Rd.)

SUMMARY OF INTERSECTIONS AND SIDEROADS

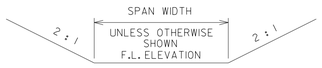
STATION	SIDE OR QUADRANT	TYPE	W	WI	W2	W3	W4	R	C	S	D	BS
56+35	Rt.	C				24'		30'				
56+35	Lt.	C				24'		30'				
59+50	Rt.	C				20'		20'				



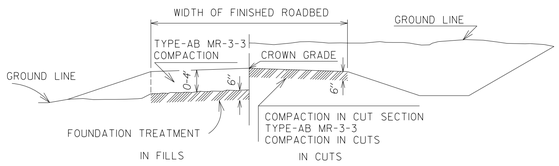
PROFILE SHOWING METHOD OF ATTAINING SUPERELEVATION

SUPERELEVATION DATA

Station P.I. of Curve	Degree Curve	Design Speed	Super Per Ft.	Transition Length Lin. Ft.	
				P.C.	P.T.

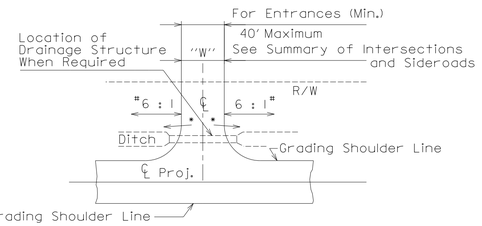


TYPICAL INLET AND OUTLET CHANNEL EXCAVATION SECTION FOR BOX STRUCTURES & PIPE CULVERTS



ALL EMBANKMENT SHALL BE COMPACTED EXCEPT DITCHPLUGS AND WASTE BERMS.

FOUNDATION TREATMENT AND COMPACTION OF EARTHWORK



TYPICAL SIDE ROAD OR ENTRANCE DETAIL

• On side roads and entrances which slope toward the roadway, construct a low point approx. 6'' deep to divert surface drainage into the roadway ditch.

* On ditch plugs and side roads or entrances without drainage structures use 8 : 1 slopes where feasible.

GENERAL NOTES

All signs shown on the plans, and other signs furnished and installed by the County with their own forces and funds will be installed in conformance with the Manual of Uniform Traffic Control Devices (latest edition).

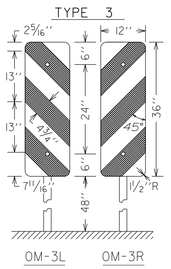
County to furnish all easements and additional right of way (unless otherwise noted).

Owners will move and adjust public and private utility facilities as necessary to fit the new construction unless noted otherwise on the plans or in the proposal.

Consider stations shown for all drainage structures as approximate only. The Project Engineer will be responsible to place all structures in locations that fit the natural drainage and meet the grade requirements.

Cut channels at all box structures (except where otherwise noted) to flowline elevations and to a width of 2' outside of each outside wall and with slopes 2 : 1 prior to installation or construction of box structure. Excavation and embankment required for this work are included in the earthwork quantities.

OBJECT MARKER



Furnish 5/16'' x 2 1/4'' SF Truss Head or Round Head Machine Screw STEEL Bolts with Plain Washer STEEL on front and 5/16" Reg. SF Hex Nut STEEL with Light Lock Washer STEEL on back. 12" x 36" Steel Blank (16 Ga. Metal)

SUMMARY OF OBJECT MARKERS AND SIGNS

STATION TO STATION	SIDE	TYPE OF STRUCT.	TYPE OF SIGN	OBJECT MARKER TYPE	OBJECT MARKER NO.	REMARKS
56+83.0	Rt.	RFB		OM-3R		
56+86.5	Lt.	RFB		OM-3L		
57+30.5	Rt.	RFB		OM-3L		
57+30.0	Lt.	RFB		OM-3R		
Ø As you face bridge end from approach						
•Back-to-Back [Sign(s) on Both Sides of Post]						

Install Object Markers Type OM-3(R)(L) at all span bridges and when indicated on the plans at box structures. Install with the inside edge of the marker in line with the inside clearance line of the structure. Install an object marker retroreflectorized on one side on both left and right sides of each end of a structure.

Mount object markers on 11' galvanized flanged channel posts (2 lbs./ft.) punched with 3/8" diameter holes on 1" centers for the top 4'.

Pay for Object Markers directly.

All items of fastening accessories will be zinc or cadmium plated. The machine screws, nuts, and washers will comply with the current Standard Specifications for State Road and Bridge Construction. All sign blanks will have rounded corners.

NO.	DATE	REVISIONS	BY	APP'D
6	11-9-04	Changed 'Culvert' to 'Structure'	DMK	RJS
5	12-1-03	Rem. Delin.'s/Add Typ. Sect./Changed OM notes	DMK	RJS
4	5-14-03	Rev. Contractor note in Gen. Notes	DMK	RJS

KANSAS DEPARTMENT OF TRANSPORTATION

TYPICAL GRADING SECTION

~~LP907~~

FHWA APPROVAL	12-06-04		APP'D	RJS	
DESIGNED	DETAILED	DMK	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	RJS	QUAN.CK.	TRACE CK.	

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	3	45

GENERAL NOTE

THE GEOLOGICAL INFORMATION SHOWN ON THESE PLANS IS FROM STUDIES MADE IN THE FIELD AND REPRESENTS THE BEST INFORMATION AVAILABLE TO SHAWNEE COUNTY.

AT BORROW AREA LOCATIONS ADJACENT TO THE RIGHT OF WAY, UTILITY POLES MAY BE SET AT THE PERMANENT LOCATIONS PRIOR TO CONSTRUCTION AS APPROVED BY THE ENGINEER PROVIDED A MINIMUM VERTICAL CLEARANCE, IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, IS OBTAINED. THE CONTRACTOR WILL BE REQUIRED TO WORK AROUND THESE POLES TO COMPLETE THE WORK.

ALL BORROW TO BE OBTAINED FROM AREAS PROVIDED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER, BOTH AS TO SUITABILITY OF MATERIAL AND SITE LOCATION. LOCATIONS WHICH, IN THE OPINION OF THE ENGINEER, CONTAIN UNSUITABLE MATERIAL OR WILL LEAVE AN UNSIGHTLY APPEARANCE ON THE PROJECT WILL NOT BE APPROVED.

CHANNELS SHALL BE CUT AT BOX CULVERTS (UNLESS OTHERWISE NOTED) TO FLOW LINE ELEVATIONS AND TO A WIDTH OF ONE FOOT OUTSIDE OF EACH OUTSIDE WALL AND WITH SLOPES 2 TO 1 PRIOR TO CONSTRUCTION OF THE CULVERT.

EMBANKMENT QUANTITIES FOR INITIAL CONSOLIDATION AND SETTLEMENT SHOWN IN THE EARTHWORK QUANTITIES ARE SUBSIDIARY TO OTHER EARTHWORK ITEMS. MATERIAL FOR THE EMBANKMENT IS INCLUDED IN THE EXCAVATION QUANTITIES.

EXCAVATION REQUIRED FOR PLACING SELECT SOIL IS INCLUDED IN THE COMMON EXCAVATION QUANTITIES.

EXCAVATION SHOWN TO BE WASTED SHALL BE WASTED ON SITES PROVIDED BY THE CONTRACTOR. THESE SITES SHALL BE APPROVED BY THE ENGINEER AS TO SUITABILITY, APPEARANCE, AND SITE LOCATION. LOCATIONS THAT, IN THE OPINION OF THE ENGINEER, WILL LEAVE AN UNSIGHTLY APPEARANCE WILL NOT BE APPROVED.

ALL TREES, HEDGE ROWS, SHELTERBELTS, AND WOODY SHRUBS NOT SHOWN TO BE REMOVED AND LOCATED BETWEEN THE CONSTRUCTION LIMITS AND THE RIGHT-OF-WAY LINE OR EASEMENT LINE SHALL BE SPARED UNLESS DIRECTED BY THE ENGINEER TO BE REMOVED. ALL TREES WITHIN THE APPROPRIATE CLEAR ZONE SHALL BE REMOVED.

DATE	BY	REFERENCES NOTED / REFERENCES CHECKED
1/5/2021	JAH	

SCALE
50′ 0 50′ 100′
PLAN: Lat. & Long.
PROFILE: Horiz. same as above
Vert.

UTILITY OWNERS

Water: Osage Co. RWD No. 8
116 N. Topeka Avenue
Burlingame, KS 66413
Phillip Cooper
philip@ruralwater8.com
(785) 221-8146

Electric: Freestate Electric
1100 SW Auburn Rd.
Topeka, Kansas 66615
Corey Calvert
linedepartment@freestate.coop
(785) 478-3444

Telephone: AT&T Kansas
220 SE 6th St., Room 360
Topeka, KS 66603
Daniel Jackson
dj2685@att.com
(816) 772-0419

℄ Prop. Imp. P.O.T. Sta. 10+00
1. Not Set, Office Location.
2. Coord.: 204176.41 N, 1948876.52 E

℄ Prop. Imp. P.I. Sta. 52+23.33
1. Not Set, Office Location.
2. Coord.: 204124.84 N, 1949093.81 E

Sta. 56+35, 40.32′ Lt. Construct 50′x24′ Culvert(RCP), Class II with 24" End Sections(RCP).

℄ Prop. Imp. P.I. Sta. 56+45.18
1. Not Set, Office Location.
2. Coord.: 204411.22 N, 1949433.31 E

℄ Prop. Imp. P.O.T. Sta. 61+13.38
1. Not Set, Office Location.
2. Coord.: 204392.02 N, 1949922.56 E

Reference Point #1
1. Set ½"x24" bar, 2" below ground.
2. ℄ 107th St., to the east 50′ S
3. West edge of mat, Vawter Rd. 20′ E
4. Metal pull post 12′ W
5. Coord.: 204235.86 N, 1948851.47 E

Reference Point #2, Prop. Imp. Sta. 55+99.88, 56.15′ Lt.
1. Set ½"x24" bar, 3" below ground.
2. Edge of mat, Wanamaker Rd. 5.3′ WNW
3. Telephone pedestal 46′ SSE
4. Top, W. end 15" CMP 62.8′ SE
5. Coord.: 204409.83 N, 1949393.82 E

Reference Point #3
1. Set ½"x24" bar, 4" below gravel.
2. Mag nail in W. face PP 10.95′ N
3. Mag nail in top, E. end 12" CMP 28.10′ SSW
4. ℄ Travelled way SW 107th St. 9′ S
5. Coord.: 204398.08 N, 1950277.87 E

Ricky W. Vawter
Tract in SE ¼ Sec. 32, T13S, R15E

Robert G. and Laura M. Alexander
Tract in SE ¼ Sec. 32, T13S, R15E

Robert G. and Laura M. Alexander
Tract in SW ¼ Sec. 33, T13S, R15E

Bolejack Irrevocable Trust
Tract in SE ¼ Sec. 32, T13S, R15E

Jones, Jessica Marie & Joshua Edwin
Tract in SE ¼ Sec. 32, T13S, R15E

Jones, Jessica Marie & Joshua Edwin
Tract in SW ¼ Sec. 33, T13S, R15E

Curve Data-℄ Prop. Imp.
P.I. Sta. 52+23.33 Bk.=
P.I. Sta. 52+01.00 Ahd.
Δ=53°-30′-00"
T=151.21′
R=300.00′
L=280.13′
E=35.95′
Superelevation=none

Curve Data-℄ Prop. Imp.
P.I. Sta. 56+45.18 Bk.=
P.I. Sta. 56+23.75 Ahd.
Δ=42°-23′-45"
T=232.70′
R=600.00′
L=443.97′
E=43.54′
Superelevation=none

Sta. 53+50 BEGIN
Proj. No. S-121045.00

Sta. 56+35, 43.46′ Rt. Construct 58′x24′ Culvert(RCP), Class II with 24" End Sections(RCP).

Sta. 57+06, 23′ Lt. REMOVE 12′ Simple Concrete Span (RCSS) Concrete/Masonry Abutments on Spread Footings, Concrete Deck 16′-6" Roadway

Sta. 57+07.55 Construct Bridge No. OSN 332 3-14′x9′x52′-3" Reinforced Concrete Rigid Frame Box (RFB), Rotate 2° Rt. See Sheet Nos. 9-17.

Sta. 59+50, 24.7′ Rt. Construct 30′x15" Culvert(CSP)(16ga.) with two 15" End Sections(CS).

Sta. 60+25 END
Proj. No. S-121045.00

W ¼ Corner Sec. 33, T13S, R15E
1. Found ⅝" bar, 3" below ground
2. Spike & washer, SE face 15" Ø walnut 9.80′ WSW
3. Spike & washer in N face power pole 95.65′ SE
4. Coord.: 205716.65 N, 1949538.88 E

SW Corner Sec. 33, T13S, R15E
1. Found ⅝" bar, 4" below gravel
2. Spike & washer, N face 8" Ø hackberry 16.82′ WNW
3. Spike & washer in S face power pole 37.17′ ESE
4. Coord.: 203063.26 N, 1949610.71 E

Datum BM=BM #3: "D" cut in top end SW rail of old Wanamaker Rd. bridge over Wakarusa. Sta. 58+08.7, 919.6′ Lt. Elev. 988.73

BM #4: Brass disc in top SE rail Wanamaker bridge over Wakarusa. Sta. 57+30.2, 1258.7′ Lt. Elev. 993.03

BM #2: "D" cut in top, NE corner of the N. headwall. Sta. 57+14.6, 29.6′ Lt. Elev. 986.92

BM #1: Railroad spike in North face power pole. Sta. 60+43.3, 23.6′ Rt. Elev. 991.21

LEGEND
Class I Riprap
Class II Riprap
Pavement Removal

† 3,081 cu. yds. Unclassified Excavation (VMF=0.75)
115 cu. yds. Rock Excavation (to be wasted)
231 cu. yds. Supplementary Borrow (VMF=0.75)
2,484 cu. yds. Embankment in Place

†Includes 962 cu. yds. from SW 107th St.;
Includes 580 cu. yds. from SW Wanamaker Rd.;
Includes 1,539 cu. yds. from clear channel, RFB Sta. 57+07.55;

Includes 1,252 cu. yds. for SW 107th St.;
Includes 34 cu. yds. for restoring Pavement Removal
Includes 893 cu. yds. for SW Wanamaker Rd.;
Includes 283 cu. yds. for clear channel, RFB Sta. 57+07.55;
Includes 22 cu. yds. for Ent. Sta. 59+50, Rt..

PLAN AND PROFILE
SW 107TH STREET
STA. 51+00 TO STA. 61+00

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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	4	45

℄ Side Rd. P.O.T. Sta. 7+25.76
1. Not Set, Office Location.
2. Coord.: 204636.02 N, 1949435.85 E

℄ Side Rd. P.I. Sta. 8+69.23
1. Not Set, Office Location.
2. Coord.: 204495.93 N, 1949404.91 E

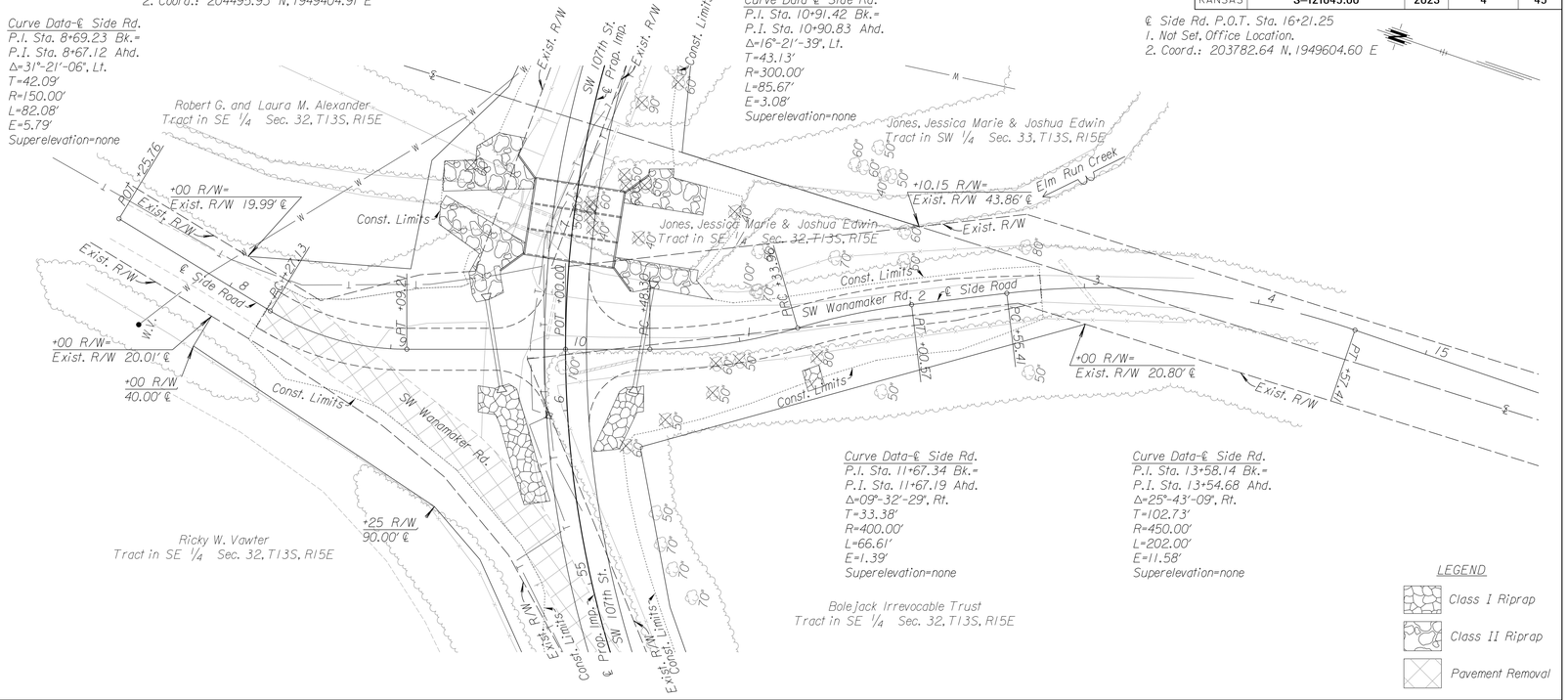
℄ Side Rd. P.O.T. Sta. 10+00.00=
℄ Prop. Imp. Sta. 56+35.00
1. Not Set, Office Location.
2. Coord.: 204495.93 N, 1949404.91 E

℄ Side Rd. P.I. Sta. 10+91.42
1. Not Set, Office Location.
2. Coord.: 204283.71 N, 1949477.57 E

℄ Side Rd. P.I. Sta. 11+67.34
1. Not Set, Office Location.
2. Coord.: 204221.24 N, 1949521.74 E

℄ Side Rd. P.I. Sta. 13+58.14
1. Not Set, Office Location.
2. Coord.: 204049.21 N, 1949604.60 E

℄ Side Rd. P.O.T. Sta. 16+21.25
1. Not Set, Office Location.
2. Coord.: 203782.64 N, 1949604.60 E



SCALE
50' 0 50' 100'

PLAN: Lat. & Long.

PROFILE: Horiz. same as above
Vert. ——→

10'
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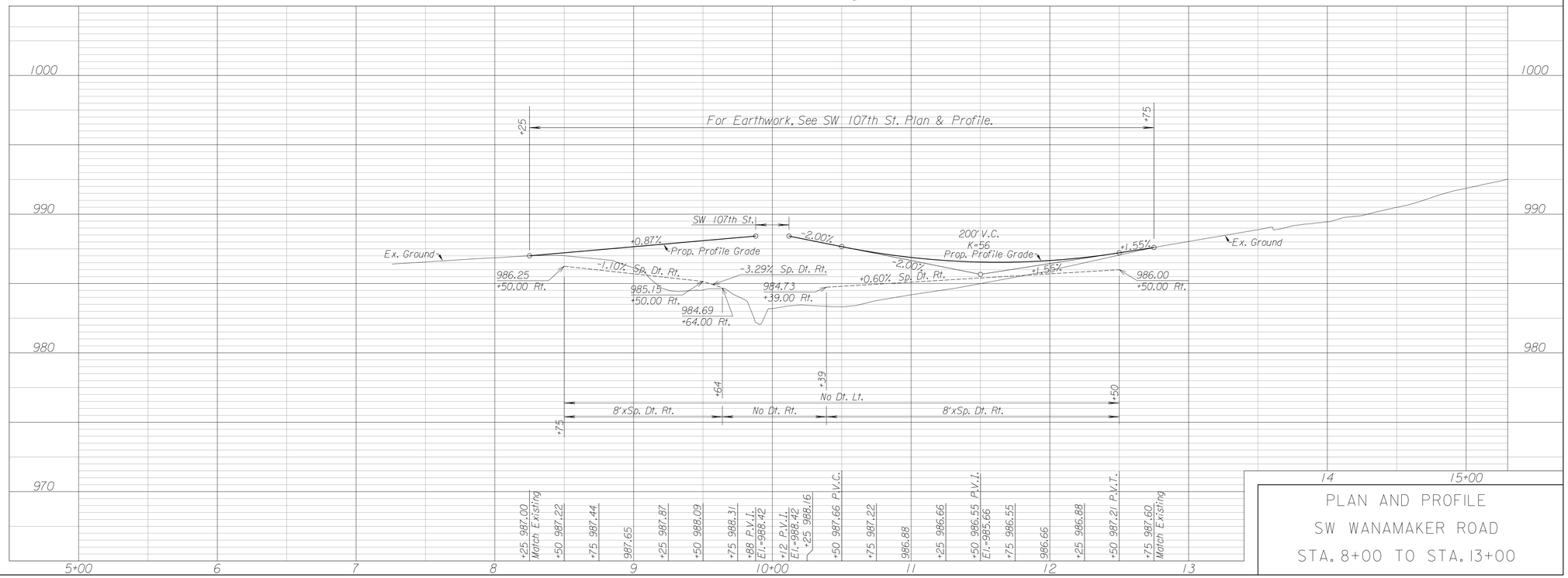

PLAN AND PROFILE
SW WANAMAKER ROAD
STA. 8+00 TO STA. 13+00

BY	DATE
JAH	1/5/2021

REFERENCES NOTED
REFERENCES CHECKED

8/4/2023
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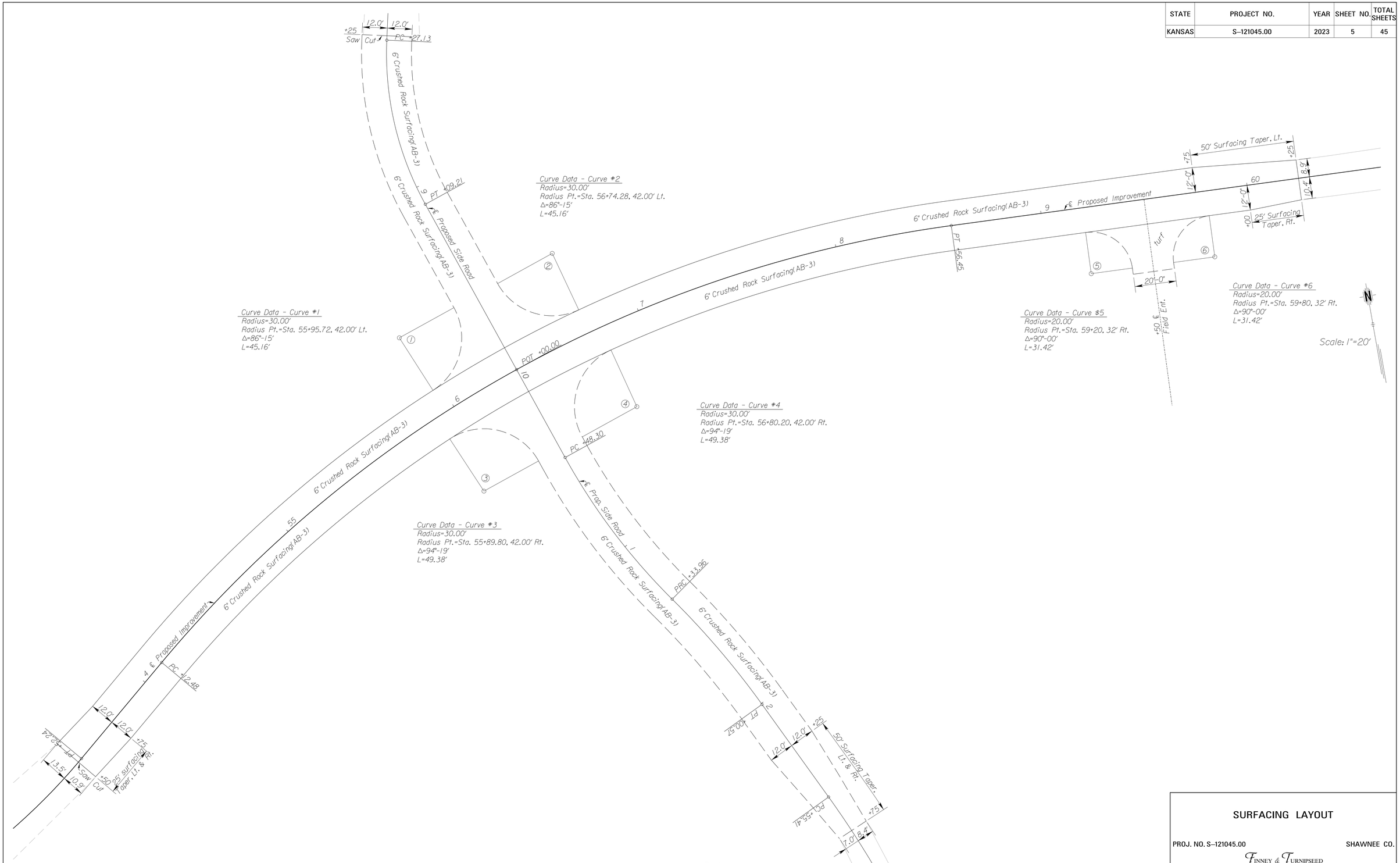
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	5	45



PLAN

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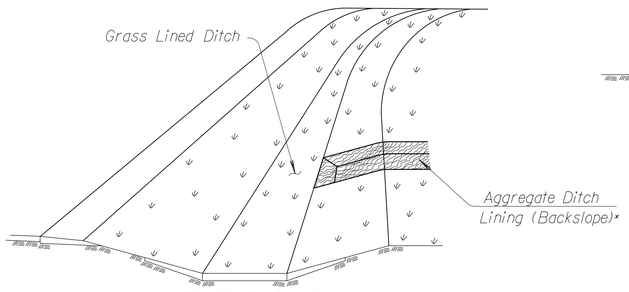
SURFACING LAYOUT

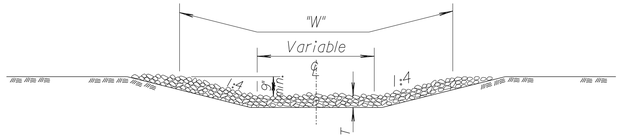
PROJ. NO. S-121045.00 SHAWNEE CO.

FINNEY & TURNIPSEED
TRANSPORTATION & CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

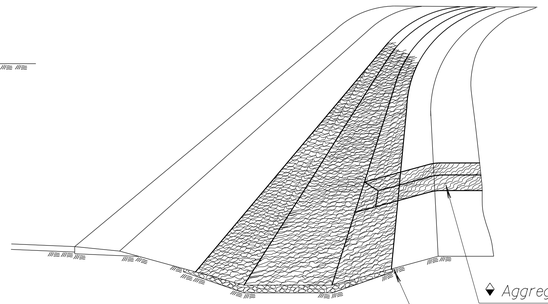
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	6	45



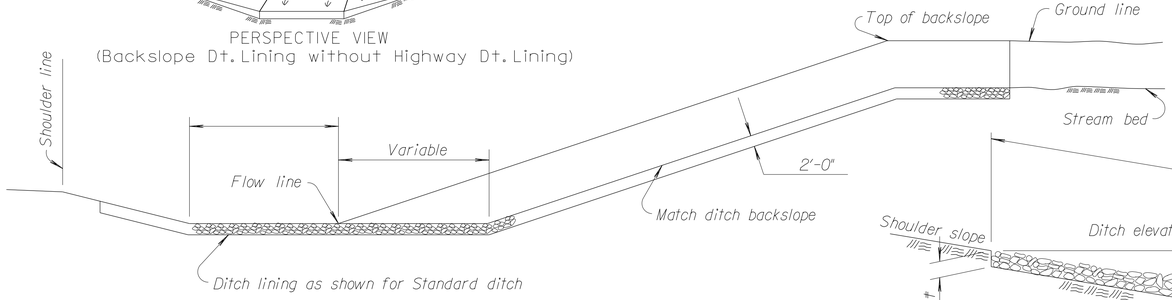
PERSPECTIVE VIEW
(Backslope Dt. Lining without Highway Dt. Lining)



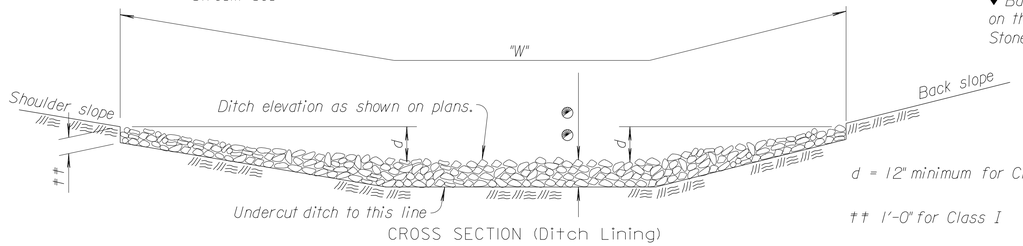
CROSS SECTION (Backslope)



PERSPECTIVE VIEW



LONGITUDINAL SECTION (Backslope)



CROSS SECTION (Ditch Lining)

CLASS I OR CLASS II STONE RIPRAP

GENERAL NOTE

All work and materials required for this construction shall be paid for by the square yard of "Class I Stone Riprap".

Dumped aggregate shall be spread in reasonable conformity with the ditch section as shown and as directed by the Engineer.

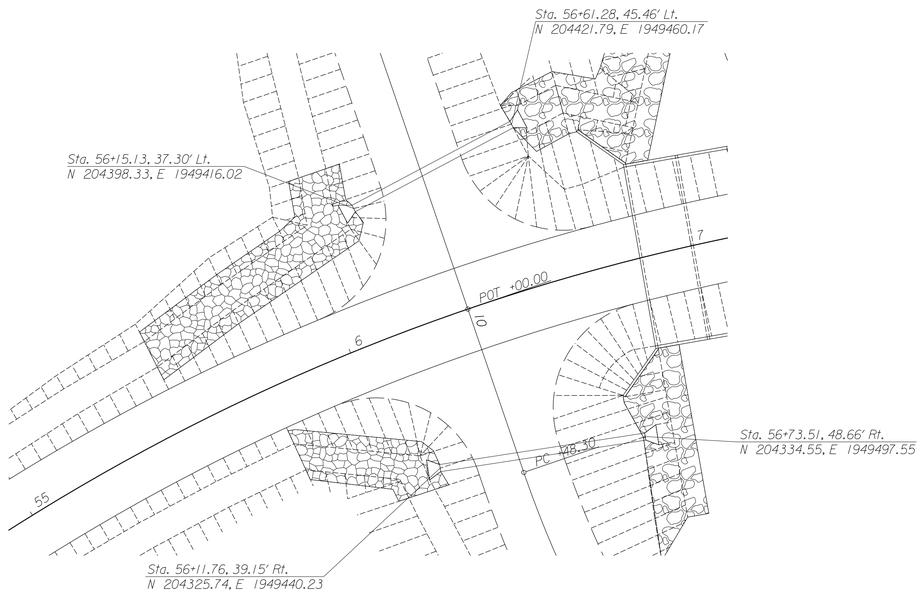
Class I Stone Riprap shall be measured and paid for by the square yard as placed at the location designated by the plans or by the Engineer and shall be full compensation for excavation for undercutting, furnishing, hauling, placing and maintaining the material as specified to complete the work.

◆ *Backslope slope protection, constructed as indicated on this sheet, shall be paid for by the square yard of "Class I Stone Riprap".*

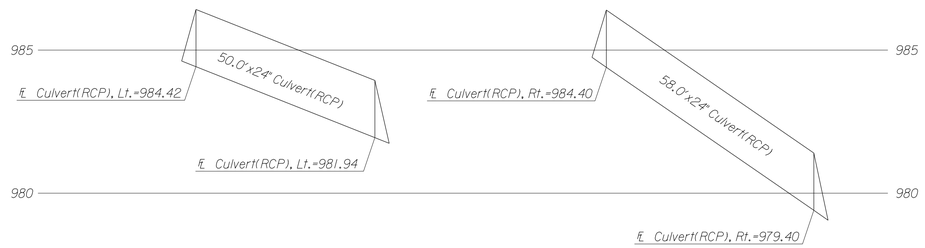
d = 12" minimum for Class I

†† 1'-0" for Class I

◔ ◔ *2'-0" for Class I*



PLAN



PROFILE

NO.	DATE	REVISIONS	BY	APP'D
8	3-20-08	Rev. agg. edge thickness and quant.	S.W.K.	J.O.B.
7	11-07-07	Revised aggregate to 120 PCF	S.W.K.	J.O.B.
6	3-22-05	Changed conc. grade, reinforcing	S.W.K.	J.O.B.
5	5-23-00	Added aggregate backslope	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

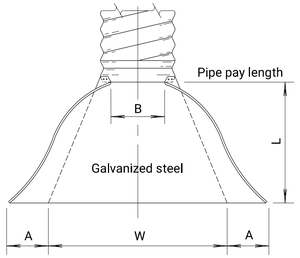
DITCH LINING & PIPE DETAILS

~~RD502~~

FHWA APPROVAL	5-28-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

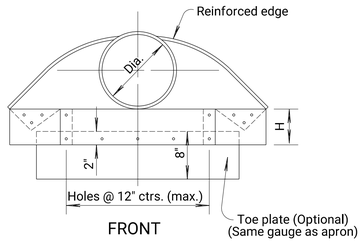
Plotted : 8/4/2023 4:32:20 PM
Drawn By : CAM
File : RD 502 Mod.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	7	45

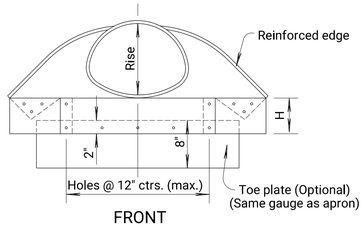


PLAN

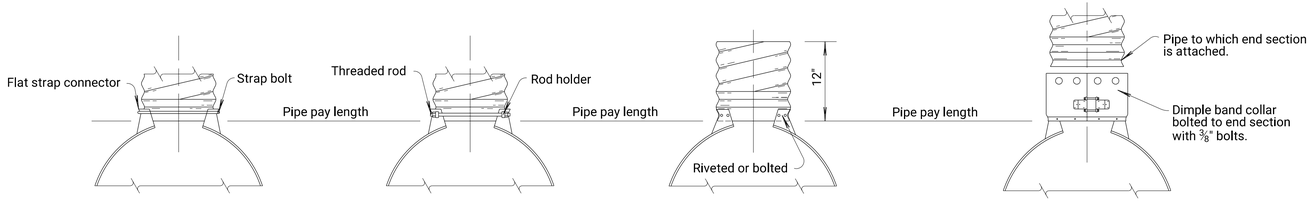
(Illustrated with Type #3 Connection)



FRONT



FRONT



TYPE 1

Available in sizes 12" through 24" only.

TYPE 2

Available in sizes 30" and 36" Round and 17"x13" through 57"x38" Pipe-Arches.

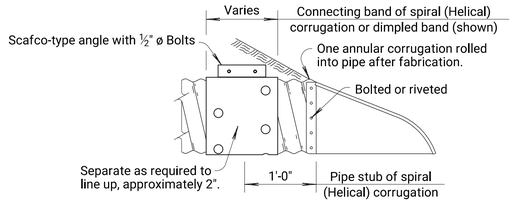
TYPE 3

Available in sizes 42" through 96" Round and 60"x46" through 81"x59" Pipe-Arches.

TYPE 5

Available for all Round and equivalent Pipe-Arch sizes, (Type 1 and Type 2 connections are recommended for the smaller sizes with annular ends).

Note: Type 3 connection may be furnished instead of Type 1 or Type 2 for smaller round or arch pipe.



SPIRAL (HELICAL) CORRUGATION

For all sizes of round and arch culvert pipes having Spiral (Helical) corrugations, the end sections and connecting bands shall be as shown above.

Thickness CSP/ACSP	Thickness CAP	Gauge
0.064"	0.060"	16 ga.
0.079"	0.075"	14 ga.
0.109"	0.105"	12 ga.
0.138"	0.135"	10 ga.
0.168"	0.164"	8 ga.

Pipe Dia. (In.)	CS, ACS or CA Gauge	Dimensions in Inches A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
12"	16	5	7	6	21	22	2½: 1
15"	16	6	8	6	26	28	2½: 1
18"	16	7	10	6	31	34	2½: 1
21"	16	8	12	6	36	40	2½: 1
24"	16	9	13	6	41	46	2½: 1
30"	14	11	16	8	51	55	2½: 1
36"	14	13	19	9	60	70	2½: 1
42"	12	15	25	10	69	82	2½: 1
48"	12	17	29	12	78	88	2¼: 1
54"	12	17	33	12	84	100	2¼: 1
60"	12/10	17	36	12	87	112	2: 1
66"	12/10	17	39	12	87	118	2: 1
72"	12/10	17	44	12	87	120	2: 1
78"	12/10	17	48	12	87	130	1½: 1
84"	12/10	17	52	12	87	136	1½: 1
90"	12/10	17	58	12	87	142	1½: 1
96"	12/10	17	58	12	87	144	1½: 1

Bid Designation Sq. Ft.	Nom. W.W. Area Sq. Ft.	Pipe Arch Span & Rise	Dimensions in Inches 2⅔" x ½" Corrugations CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Dimensions in Inches 3" x 1" or 5" x 1" Corr. CS, ACS or CA Gauge	A (min.)	B (max.)	H (min.)	L (±2")	W (min.)	Approx. Slope
1.0	1.1	17" x 13"	16	5	9	6	20	28							2½: 1
1.5	1.6	21" x 15"	16	6	11	6	24	34							2½: 1
2.0	2.2	24" x 18"	16	7	12	6	28	40							2½: 1
2.5	2.9	28" x 20"	16	7	16	6	32	46							2½: 1
3.0 or 4.0	4.5	35" x 24"	14	9	16	6	39	58							2½: 1
5.0 or 6.0	6.5	42" x 29"	14	11	18	7	46	73							2½: 1
7.0 or 8.5	8.9	49" x 33"	12	12	21	9	53	82							2½: 1
10.0 or 11.0	11.7	53" x 41"							12	17	26	12	63	88	2: 1
10.0 or 11.0	11.6	57" x 38"	12	16	26	12	62	88							2: 1
12.5 or 14.0	15.6	60" x 46"							12	17	36	12	70	100	2: 1
12.5 or 14.0	14.7	64" x 43"	12	17	30	12	69	100							2: 1
16.5	19.3	66" x 51"							12/10	17	36	12	70	112	1½: 1
16.5	18.1	71" x 47"	12/10	17	36	12	77	112							1½: 1
21.0	23.2	73" x 55"							12/10	17	36	12	77	124	1½: 1
21.0	21.9	77" x 52"	12/10	17	36	12	77	124							1½: 1
25.0	27.4	81" x 59"							12/10	17	44	12	77	136	1½: 1
25.0	26.0	83" x 57"	12/10	17	44	12	77	130							1½: 1
32.0	32.1	87" x 63"							12/10	17	44	12	77	136	1½: 1
36.0	37.0	95" x 67"							12/10	17	44	12	87	160	1½: 1
42.0	42.4	103" x 71"							12/10	17	44	12	87	172	1½: 1
47.0	48.0	112" x 75"							12/10	17	44	12	87	172	1½: 1

(Information listed in these tables are nominal and may vary by manufacturer.)

GENERAL NOTE for END SECTIONS

End section material shall follow KDOT Pipe Policy for geographic location. Location shall govern use of CS (Galvanized), ACS (Aluminized) or CA (Aluminum) (Type I) End Section. Pipe material and End Section material shall be the same with no mixing of types per location.

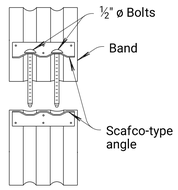
Toe plate extension, when specified, is an accessory and shall be the same gauge and metal as end section. Toe plate shall be punched to match holes in apron lip and attached with furnished 3#8" diameter nuts & bolts.

W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 84" diameter pipes inclusive.
W + 10" for pipe-arches with a rise of 13" to 29" inclusive.
W + 20" for pipe-arches with a rise of 33" to 59" inclusive.

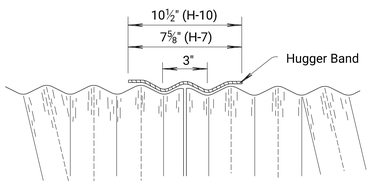
Multiple panel end sections may contain dual gauges of like metal and shall have lap seams which are tightly joined with rivets or bolts. For 60" and larger diameter round pipe end sections and 77"x52" arch pipe end sections, the reinforced edges are supplemented with stiffener angles. The angles are attached with nuts and bolts. Angle reinforcement may be required uder the center panel seams of 73"x55" and larger arch pipe end sections depending on manufacturer.

Other approved designs may be used in lieu of type shown.

Connection of end sections by welding will not be permitted.

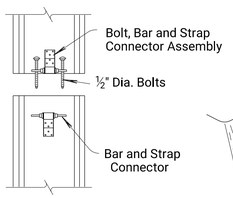


CONNECTION DETAIL
H-7 or H-10 BAND

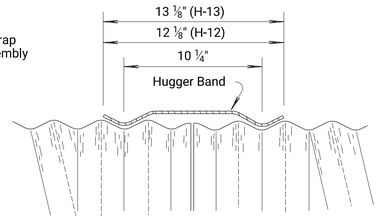


UNIVERSAL REFORMED END with
H-7 or H-10 HUGGER BAND

DETAILS FOR H-7 HUGGER BAND (12" thru 36")
or H-10 HUGGER BAND (12" thru 120")



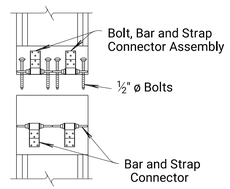
CONNECTION DETAIL
SINGLE HARNESS



UNIVERSAL REFORMED END with
HUGGER BAND

DETAILS FOR H-12 or H-13 HUGGER BAND

Pipe Dia. Inches	Minimum Gauge of Round Pipe 2⅔" x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
12"	14			16	
15"	14			16	
18"	14			16	
21"	14			16	
24"	14			16	
30"	14			14	
36"	14			14	16
42"	14			12	16
48"	12	14	16	14	16	12	16
54"	12	14	16	14	16	12	16
60"	10	14	16	14	16	10	16
66"	10	14	16	14	16	8	16
72"	10	14	16	14	16	8	16
78"	8	14	14	14	14		14
84"	8	14	14	14	14		12
90"		14	14	14	14		12
96"		12	12	12	12		12
102"		12	12	12	12		10
108"		12	12	12	12		10
114"		12	12	12	12		8
120"		10	10	10	10		8



CONNECTION DETAIL
DOUBLE HARNESS

Bid Designation Sq. Ft.	Pipe Dimension Span & Rise	Sq. Ft.	Equiv. Round Pipe Diameter	Minimum Gauge of Arch Pipe 2⅔"x ½" Corr. CSP or ACSP	3" x 1" Corr. CSP or ACSP	5" x 1" Corr. CSP or ACSP	2⅔"x ½" Corr. CAP	3" x 1" Corr. CAP
1.0	17" x 13"	1.1	15"	14			16	
1.5	21" x 15"	1.6	18"	14			16	
2.0	24" x 18"	2.2	21"	14			16	
2.5	28" x 20"	2.9	24"	14			14	
3.0 or 4.0	35" x 24"	4.5	30"	14			14	
5.0 or 6.0	42" x 29"	6.5	36"	14			12	
7.0 or 8.5	49" x 33"	8.9	42"	14			12	
10.0 or 11.0	53" x 41"	11.7	48"		14			
10.0 or 11.0	57" x 38"	11.6	48"	12			10	
12.5 or 14.0	60" x 46"	15.6	54"		14			14
12.5 or 14.0	64" x 43"	14.7	54"	12			10	
16.5	66" x 51"	19.3	60"		14			14
16.5	71" x 47"	18.1	60"	10			8	
21.0	73" x 55"	23.2	66"		14			14
21.0	77" x 52"	21.9	66"	8				
25.0	81" x 59"	27.4	72"		14	12		12
25.0	83" x 57"	26.0	72"	8				
32.0	87" x 63"	32.1	78"		12	12		12
36.0	95" x 67"	37.0	84"		12	12		12
42.0	103" x 71"	42.4	90"		12	12		10
47.0	112" x 75"	48.0	96"		12	12		8
54.0	117" x 79"	54.2	102"		10	10		
60.0	128" x 83"	60.5	108"		10	10		
67.0	137" x 87"	67.4	114"		10	10		
74.0	142" x 91"	74.5	120"		8	8		

GENERAL NOTE for METAL PIPE

Culvert "Type" listed may be CSP, ACSP, CAP, RCP, PVCP & PEP within guidelines of KDOT Pipe Policy for geographic location. More than one pipe "Type" may be acceptable for a design location with allowable types listed for each site.

There shall be no payment for gain in pipe length due to fit of pipe at connecting band.

When Hugger Bands are used, the H-7 Hugger Band may be used on circular pipes 36" diameter and smaller or pipe arches 42"x 29" and smaller. The H-10 Hugger Band may be used on 12" thru 120" pipe. The H-12 or H-13 Hugger Band are for pipe sizes larger than 36" diameter or 42"x29" arch pipe.

⊛ Pipe gauge listed in the tables on this sheet are minimum for E'=750 p.s.i. soil. Pipe gauge will be determined for each site based on the Design Manual Volume I- Part C Fill Height Tables and shall shall be listed in the Pipe Culvert Summary. Gauges shown on this Standard Drawing are KDOT minimum and may not be industry minimum gauge.

In geographic areas that allow CSP (24" or smaller arched or round pipe) for entrance and side road installation with less than 3,000 AADT, 16 gauge ACSP may be substituted for 14 gauge CSP.

Aluminum or aluminized pipes or end sections shall be coated with an asphaltic paint when in contact with fresh concrete in accordance with the Standard Specifications.

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

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NO.	DATE	REVISIONS	BY	APP'D
4	9-10-09	Rev. Round and Arch tables, add. Alum.	S.W.K.	J.O.B.
3	1-20-09	Rev. Round Pipe Gauges	S.W.K.	J.O.B.
2	4-1 8-08	Rev. layout, details, tables and notes	S.W.K.	J.O.B.
1	4-27-98	Added pipe corrugation option note	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

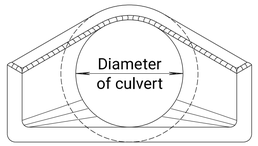
METAL END SECTION FOR ROUND & ARCH METAL CULVERTS (TYPE I) & PIPE GAUGE TABLES

RD660

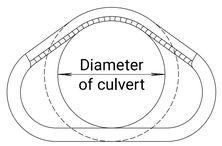
FHWA APPROVAL 12-16-09		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	5-121045.00	2023	8	45

Note to Designer: KDOT Pipe Policy provides guidance in identifying the prohibited and/or restricted uses of CSP, ACSP, PEP, PVCP, CAP & RCP. Provide end sections of the same type and coating as the pipe. Exceptions to this are noted in the Standard Specifications. Refer to the KDOT Design Manual, Volume I (Part C), Road Section, "Elements of Drainage & Culvert Design" for structural pipe design information which includes: corrugations, sizes, gauges, maximum/minimum fill heights and classes of pipe.

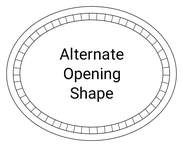


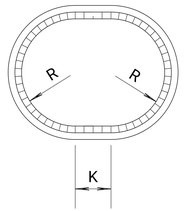
END ELEVATION (TYPE I)



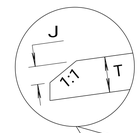
SECTION A-A

Showing rounding of inside edge of end section.





END ELEVATION
(TYPE III)

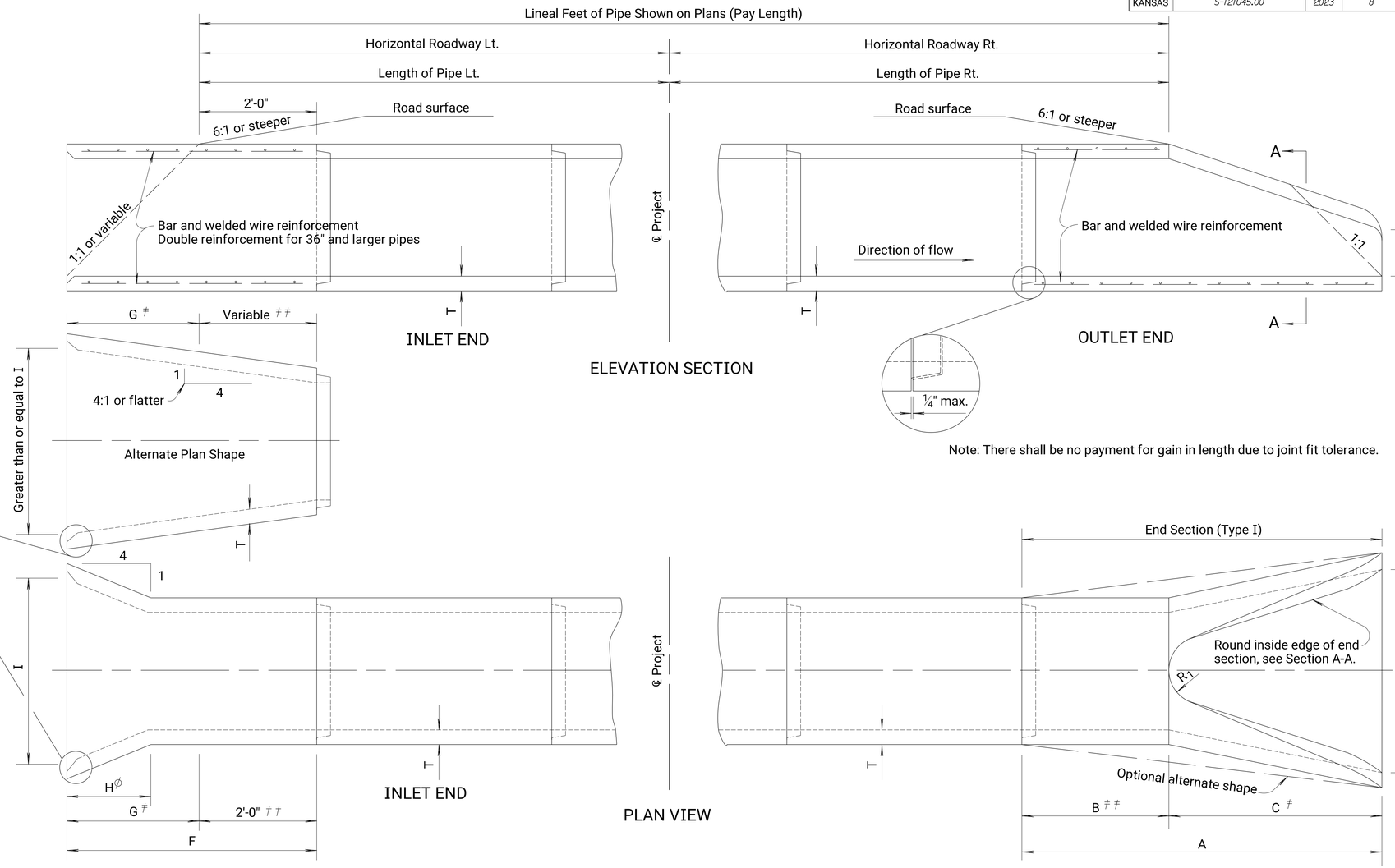


ϕ Transition to round pipe.

≠ Paid for as separate item of End Section, except when structures shall bid as alternates. In that case End Sections shall be subsidiary to bid item. "Drainage Structure No. ".

≠≠ Included in pay length of pipe.

⚹ Minimum waterway area is calculated at the inside of the bevel.



Note: There shall be no payment for gain in length due to joint fit tolerance.

END SECTION (TYPE I) NOMINAL DIMENSIONS

Diam.	A	B ≠≠	C ≠	D	E	R_I	Slope	T
12"	6'-0 7/8"	4'-0 7/8"	2'-0"	2'-0"	4"	9	3:1	2"
15"	6'-1"	3'-10"	2'-3"	2'-6"	6"	11	3:1	2 1/4"
18"	6'-1"	3'-10"	2'-3"	3'-0"	9"	12	3:1	2 1/2"
24"	6'-1 1/2"	2'-6"	3'-7 1/2"	4'-0"	9 1/2"	14	3:1	3"
30"	6'-1 3/4"	1'-7 3/4"	4'-6"	5'-0"	1'-0"	15	3:1	3 1/2"
36"	8'-1 3/4"	2'-10 3/4"	5'-3"	6'-0"	1'-3"	20	3:1	4"
42"	8'-2"	2'-11"	5'-3"	6'-6"	1'-9"	22	3:1	4 1/2"
48"	8'-2"	2'-2"	6'-0"	7'-0"	2'-0"	22	3:1	5"
54"	8'-2 1/4"	2'-9 1/4"	5'-5"	7'-6"	2'-3"	24	2.4:1	5 1/2"
60"	8'-3"	3'-3"	5'-0"	8'-0"	2'-11"	24	21	6"
72"	8'-3"	1'-9"	6'-6"	9'-0"	3'-0"	24	1.86:1	7"
84"	9'-3 1/2"	1'-9"	7'-6 1/2"	10-0"	3'-0"	24	1.6:1	8"

SIDE TAPERED INLET SECTION (TYPE III)-NOMINAL DIMENSIONS

Diam.	Min. W.W. ⚹ Area Sq. Ft.	F	G	H	I	J	K	R	T
24"	4.5	4'-3"	2'-3"	1'-5 1/8"	2'-8"	1 1/2"	8"	1'-0"	3"
30"	7.0	4'-9 1/2"	2'-9 1/2"	1'-9 1/2"	3'-4"	2"	10"	1'-3"	3 1/2"
36"	10.1	5'-4"	3'-4"	2'-1 1/2"	4'-0"	2"	1'-0"	1'-6"	4"
42"	13.7	5'-10 1/2"	3'-10 1/2"	2'-5 7/8"	4'-8"	2 1/2"	1'-2"	1'-9"	4 1/2"
48"	17.9	6'-5"	4'-5"	2'-10 1/8"	5'-4"	3"	1'-4"	2'-0"	5"
54"	22.7	6'-11 1/2"	4'-11 1/2"	3'-2 1/2"	6'-0"	3 1/2"	1'-6"	2'-3"	5 1/2"
60"	28.0	7'-6"	5'-6"	3'-6 7/8"	6'-8"	4"	1'-8"	2'-6"	6"
72"	40.3	8'-7"	6'-7"	4'-3 5/8"	8'-0"	5"	2'-0"	3'-0"	7"
84"	54.8	9'-8"	7'-8"	5'-0 3/8"	9'-4"	6"	2'-4"	3'-6"	8"

Dimensions for alternate shapes shall be equal to or greater than those shown in the table, unless otherwise shown.

NO.	DATE	REVISIONS	BY	APP'D
2	4-18-08	Added ref. to KDOT Pipe Policy	S.W.K	J.O.B
1	4-05-05	Revised reinforcement callout	S.W.K	J.O.B

KANSAS DEPARTMENT OF TRANSPORTATION

CONCRETE END SECTIONS FOR CONCRETE PIPES TYPE I & SIDE TAPERED INLET SECTION (TYPE III)

RD662

FHWA APPROVAL 6-27-08		APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

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Drawn By : CAM
File : Road Stds.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	9	45

SUMMARY OF QUANTITIES

Item / Location	Class III Excavation yd³	Concrete Grade 4.0 (AE) yd³	Reinforcing Steel Grade 60 lbs.		Foundation Stabilization (Set Price) yd³	Class II Stone Riprap yd²	Geotextile (Erosion Control) yd²
OSN 332	236	258.2	63,620		53	459	275
Total	236	258.2	63,620		53	459	275

LFD & LRFR RATING FACTORS

Truck / Rating Level		Inventory	Operating
HS-20	(36T)	2.04	2.65
Type HET	(110T)		2.67

2002 LFD Rating, 17th Edition AASHTO

INDEX TO BRIDGE DRAWINGS

GENERAL NOTES

REMOVAL OF EXISTING STRUCTURE: Removal of existing structure is included in the bid item, "Removal of Existing Structures", Lump Sum. Remove the structure to the limits shown on the plans. All materials removed from the existing structure shall become the property of the Contractor. Remove this material from the site.

BRIDGE EXCAVATION: All excavation shall be Class III. See Bridge Excavation sheet for the limits of pay excavation. Any excavation adjacent to bridge that is not shown on the Bridge Excavation sheet shall be subsidiary to other items of the contract.

BACKFILL COMPACTION: Compact backfill to Shawnee County Type A (MR 3-3).

CONCRETE: All concrete shall be bid as Concrete Grade 4.0 (AE). Bevel all exposed edges of all concrete with a ¾" triangular moulding, except where otherwise noted on the plans. Construction joints are optional with the Contractor, but if used, place only at locations shown, or at locations approved by the Engineer.

REINFORCING STEEL: All reinforcing steel dimensions are to centerline of bars unless otherwise noted. All reinforcing steel shall conform to the requirements of ASTM A615, Grade 60.

SEAL COURSE: A Seal Course shall be required on this project. The seal course shall be unreinforced concrete (2000 psi minimum) to a minimum depth of 3 inches or as determined by the Engineer. The seal course shall not be paid for directly, but shall be subsidiary to "Concrete Grade 4.0 (AE)".

FOUNDATION STABILIZATION: A concrete seal course is required. Foundation stabilization material shall be placed as directed by the Engineer. Any material placed beyond the limits determined as needed by the Engineer shall be at the Contractor's expense.

CLASS II Stone Riprap: Place Class II Stone Riprap to the limits and thicknesses shown on the plans or as directed by the Engineer. Riprap stone shall be a minimum of 2'-6" in thickness.

BACKFILL MATERIAL FOR STRUCTURE: The soil excavated for the existing channel shall be stockpiled on the project site. This soil shall be placed as the final grading of the channel and on the buried floor of the RFB.

QUANTITIES: Items not listed separately in the Summary of Quantities are subsidiary to other items in the proposal.

DIMENSIONS: All dimensions shown on these design plans are horizontal dimensions unless otherwise noted. Make necessary allowances for roadway grade and cross slope.

GEOTEXTILE (EROSION CONTROL): The bid item "Geotextile (Erosion Control)" shall be placed as directed by the Engineer on the temporary cut slopes for erosion protection. Quantity is estimated and shall be measured by the square yard for material actually used. This bid item includes all materials, labor, tools and incidentals necessary to install and remove the geotextile fabric. Fabric material shall be in accordance with Section 1700 of the KDOT Standard Specifications for erosion control.

DESIGN DATA

DESIGN LOADING: HL-93 AASHTO Specifications, 2018 Edition, with Interims, Load and Resistance Factor Design.

UNIT STRESSES:

Concrete Grade 4.0 (AE)	f'c = 4,000 psi
Reinforcing Steel (Grade 60)	fy = 60,000 psi

BR. NO. OSN 332 STA. 57 + 07.55

SUMMARY OF QUANTITIES & GENERAL NOTES

SW 107th STREET OVER ELM RUN

PROJ. NO. S-121045.00 SHAWNEE CO.

FINNEY & TURNIPSEED
TRANSPORTATION & CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

8/4/2023
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℄ Prop. Imp. P.O.T. Sta. 10+00
1. Not Set, Office Location.
2. Coord.: 204176.41 N, 1948876.52 E

℄ Prop. Imp. P.I. Sta. 52+23.33
1. Not Set, Office Location.
2. Coord.: 204124.84 N, 1949093.81 E

℄ Prop. Imp. P.I. Sta. 56+45.18
1. Not Set, Office Location.
2. Coord.: 204411.22 N, 1949433.31 E

℄ Prop. Imp. P.O.T. Sta. 61+13.38
1. Not Set, Office Location.
2. Coord.: 204392.02 N, 1949922.56 E

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	10	45

Reference Point #1
1. Set ½"x24" bar, 2" below ground.
2. ℄ 107th St. to the east 50' S
3. West edge of mat, Vawter Rd. 20' E
4. Metal pull post 12' W
5. Coord.: 204235.86 N, 1948851.47 E

Reference Point #2, Prop. Imp. Sta. 55+99.88, 56.15' Lt.
1. Set ½"x24" bar, 3" below ground.
2. Edge of mat, Wanamaker Rd. 5.3' WNW
3. Telephone pedestal 46' SSE
4. Top, W. end 15" CMP 62.8' SE
5. Coord.: 204409.83 N, 1949393.82 E

Reference Point #3
1. Set ½"x24" bar, 4" below gravel.
2. Mag nail in W. face PP 10.95' N
3. Mag nail in top, E. end 12" CMP 28.10' SSW
4. ℄ Travelled way SW 107th St. 9' S
5. Coord.: 204398.08 N, 1950277.87 E

Sta. 57+06, 23' Lt. REMOVE
12' Simple Concrete Span (RCSS)
Concrete/Masonry Abutments Spread
Footings, Concrete Deck 16'-6" Roadway

+00 R/W=
Exist. R/W 20.01' ℄

+00 R/W
40.00' ℄

+00 R/W=
Exist. R/W 19.99' ℄

PC=+27.13

+30 R/W
85.00' ℄

+75 R/W
90.00' ℄

Robert G. and Laura M. Alexander
Tract in SE ¼ Sec. 32, T13S, R15E

+25 R/W
90.00' ℄

Exist. R/W

SW Wanamaker Rd.

℄ Side Road

POT +09.21

+75 R/W
50.00' ℄

+25 R/W
60.00' ℄

Robert G. and Laura M. Alexander
Tract in SW ¼ Sec. 33, T13S, R15E

Ricky W. Vawter
Tract in SE ¼ Sec. 32, T13S, R15E

Const. Limits

Sta. 60+25 END
Proj. No. S-121045.00

+25 R/W=
Exist. R/W 29.01' ℄

Curve Data-℄ Prop. Imp.
P.I. Sta. 52+23.33 Bk.=
P.I. Sta. 52+01.00 Ahd.
Δ=53°-30'-00"
T=151.21'
R=300.00'
L=280.13'
E=35.95'
Superelevation=none

+06.60 R/W=
Exist. R/W 37.02' ℄

+75 R/W
40.00' ℄

POT +00.00

PC=+42.12

Exist. R/W

Sta. 53+50 END
Proj. No. S-121045.00

℄ Prop. Improvement

SW 107th St.

PC=+48.30

+75 R/W
40.00' ℄

+75 R/W
40.00' ℄

+75 R/W
40.00' ℄

+25 R/W=
Exist. R/W 24.50' ℄

Bolejack Irrevocable Trust
Tract in SE ¼ Sec. 32, T13S, R15E

W ¼ Corner Sec. 33, T13S, R15E
1. Found ⅝" bar, 3" below ground
2. Spike & washer, SE face 15" Ø walnut 9.80' WSW
3. Spike & washer in N face power pole 95.65' SE
4. Coord.: 205716.65 N, 1949538.88 E

Curve Data-℄ Prop. Imp.
P.I. Sta. 56+45.18 Bk.=
P.I. Sta. 56+23.75 Ahd.
Δ=42°-23'-45"
T=232.70'
R=600.00'
L=443.97'
E=43.54'
Superelevation=none

PRC +33.96

SW Wanamaker Rd.

Const. Limits

℄ Side Road

Elm Run Creek

Exist. R/W

+00 R/W=
Exist. R/W 20.80' ℄

+59.80 R/W
55.00' ℄

+25 R/W
45.00' ℄

+75 R/W
40.00' ℄

+50 R/W=
Exist. R/W 10.64' ℄

Jones, Jessica Marie & Joshua Edwin
Tract in SE ¼ Sec. 32, T13S, R15E

Sta. 57+07.55 Construct
Bridge No. 00089
3-14'x9'x52'-3" Reinforced Concrete
Rigid Frame Box (RFB), (Embedded)
Rotate 2° Rt. See Sheet Nos. 9-17.

Jones, Jessica Marie & Joshua Edwin
Tract in SW ¼ Sec. 33, T13S, R15E

+10.15 R/W=
Exist. R/W 43.86' ℄

SW Corner Sec. 33, T13S, R15E
1. Found ⅝" bar, 4" below gravel
2. Spike & washer, N face 8" Ø hackberry 16.82' WNW
3. Spike & washer in S face power pole 37.17' ESE
4. Coord.: 203063.26 N, 1949610.71 E

Datum BM=BM #3: "□" cut in top end SW rail of old Wanamaker Rd. bridge over Wakarusa.
Sta. 58+08.7, 919.6' Lt. Elev. 988.73

BM #4: Brass disc in top SE rail Wanamaker bridge over Wakarusa.
Sta. 57+30.2, 1258.7' Lt. Elev. 993.03

BM #2: "□" cut in top, NE corner of the N. headwall.
Sta. 57+14.6, 29.6' Lt. Elev. 986.92

BM #1: Railroad spike in North face power pole.
Sta. 60+43.3, 23.6' Rt. Elev. 991.21

BR. NO. OSN 332 STA. 57 + 07.55

CONTOUR MAP
SW 107th STREET OVER ELM RUN

PROJ. NO. S-121045.00 SHAWNEE CO.

FINNEY & TURNIPSEED
TRANSPORTATION & CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

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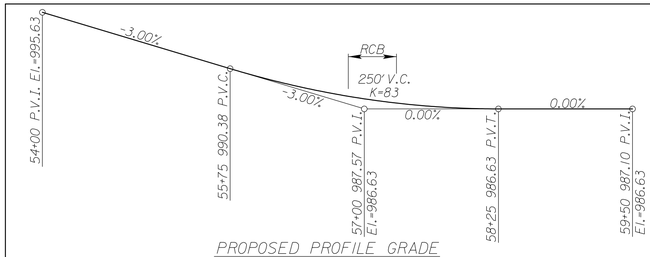
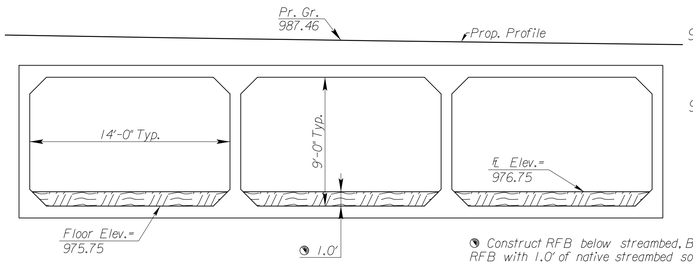
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	11	45

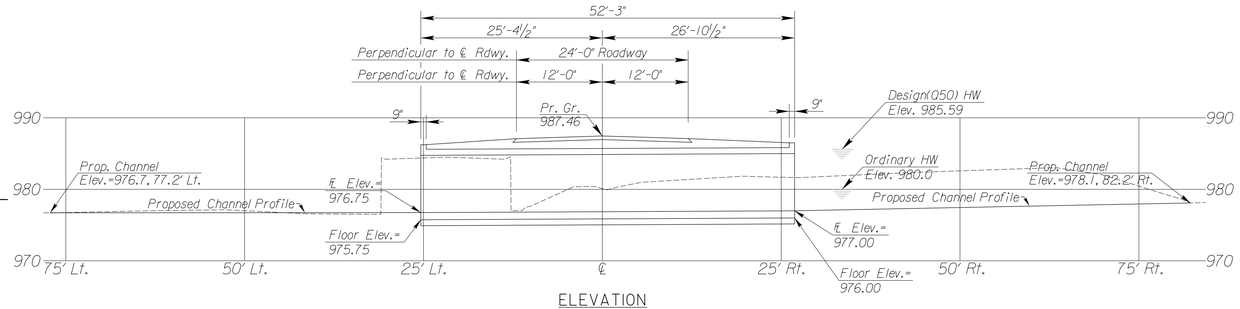


PROPOSED PROFILE GRADE
(not to scale)



SECTION OF RFB

Construct RFB below streambed. Backfill RFB with 1.0' of native streambed soil to proposed ℄.



ELEVATION
Along ℄ RFB, Sta. 57+07.55
3-14'x9'x52'-3" RFB
(Embedded Structure)

DRAINAGE DATA

Drainage Area	2.6 Sq. Mi.
Design Frequency	50 Yr.
Design Discharge (Q_{50})	2,476 cfs
Design High Water Elevation	985.59 Ft.
Change in Design Backwater	-0.99 Ft.
Design Backwater Elevation	985.71 Ft.
Overtopping Elevation (Sta. 58+25)	986.64 Ft.
Overtopping Discharge	2,960 cfs
Overtopping Frequency	50+ Yr.
Discharge at Q_{100}	3,115 cfs
Change in Backwater @ Q_{100}	-0.17 Ft.
Backwater Elevation @ Q_{100}	986.82 Ft.
Historic Highwater Elevation	N/A Ft.
Ordinary Highwater Elevation	980.0 Ft.
Total Waterway Provided	336 Sq. Ft.
Design Waterway Provided	336 Sq. Ft.
Estimated Ordinary High Water Discharge	260 cfs
Average Velocity at Q_{50}	6.0 fps
Average Velocity at Q_{100}	7.1 fps

BM #4: Brass disc in top SE rail Wanamaker bridge over Wakarusa. Sta. 57+30.2, 1258.7' Lt. Elev. 993.03

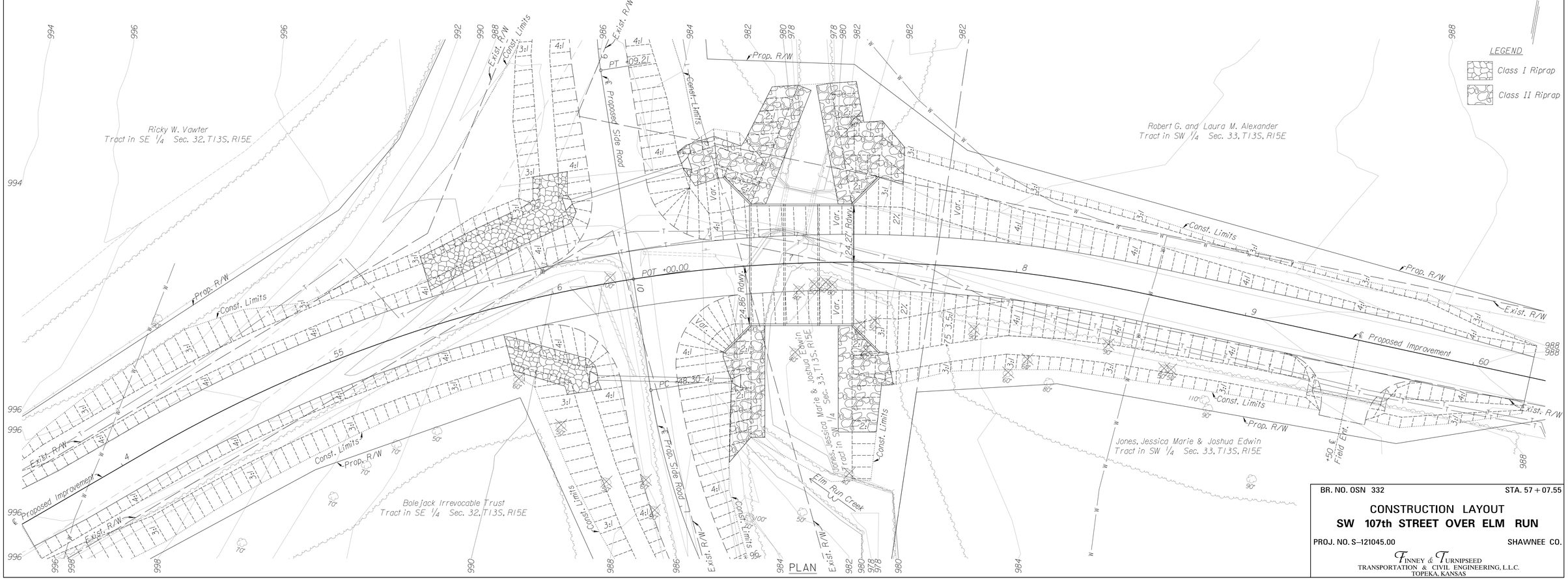
BM #3: "O" cut in top end SW rail of old Wanamaker Rd. bridge over Wakarusa. Sta. 58+08.7, 919.6' Lt. Elev. 988.73

BM #2: "O" cut in top, NE corner of the headwall. Sta. 57+14.6, 29.6' Lt. Elev. 986.92

BM #1: Railroad spike in North face power pole. Sta. 60+43.3, 23.6' Rt. Elev. 991.21

Plan Scale: 1"=20'
Elevation Scale: 1"=10'
Section Scale: 1"=5'

LEGEND
Class I Riprap
Class II Riprap



PLAN

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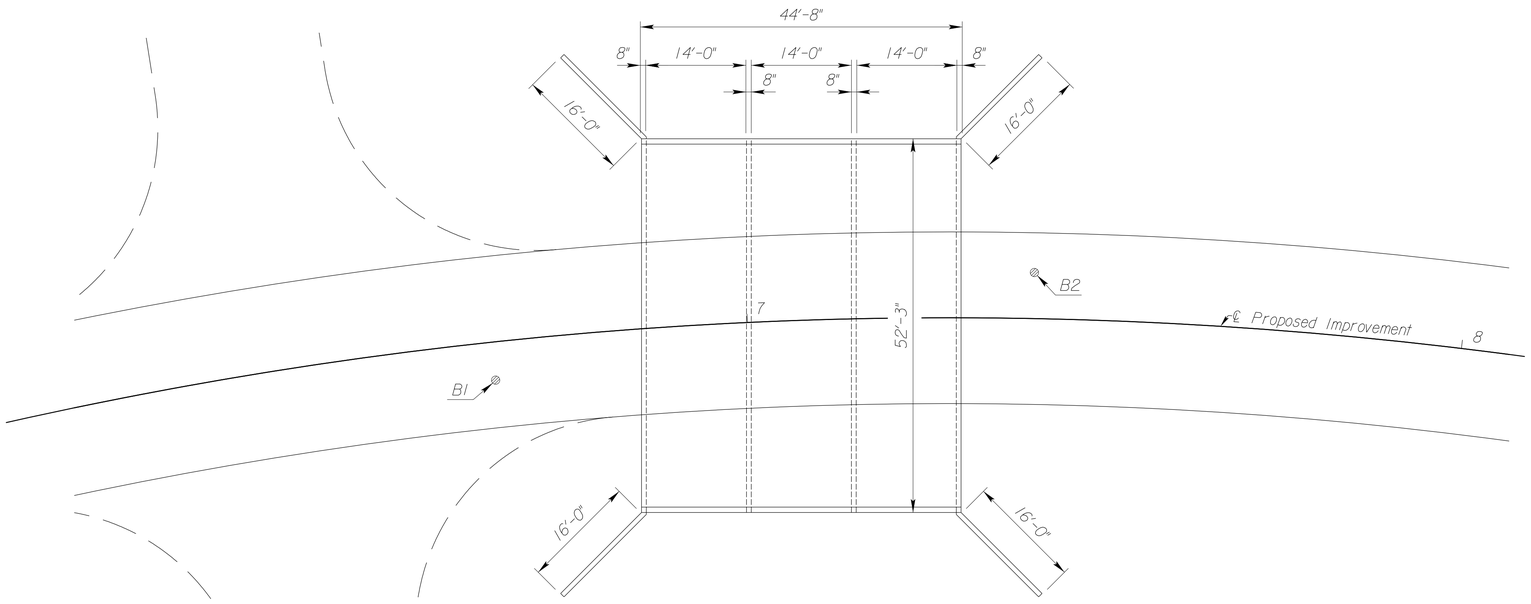
BR. NO. OSN 332 STA. 57 + 07.55

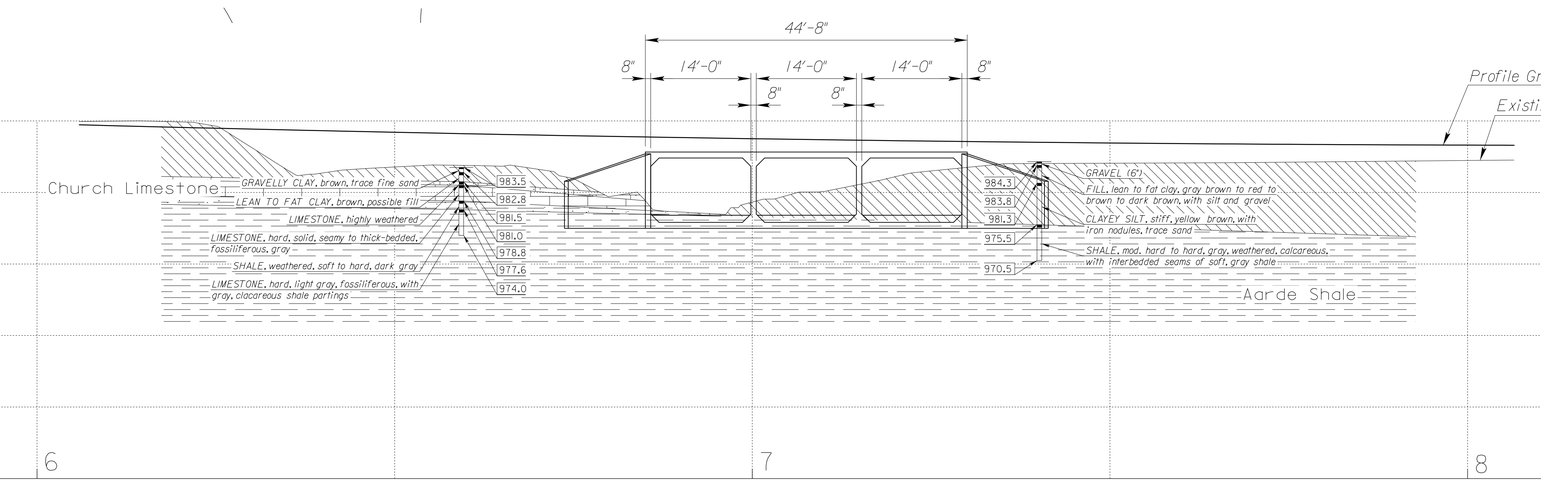
CONSTRUCTION LAYOUT
SW 107th STREET OVER ELM RUN

PROJ. NO. S-121045.00 SHAWNEE CO.

FINNEY & TURNIPSEED
TRANSPORTATION & CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	12	45





N

SCALE: 1"=10'

STANDARD GEOLOGIC SYMBOLS

- Clay or Underclay
- Silty Clay
- Silt
- Sand
- Gravel
- Boulders
- Caliche
- Silty Clayey Shale
- Limy Shale
- Black or Fissile Shale
- Sandy Shale
- Gypsiferous Shale
- Weathered Shale
- Sandstone
- Shaly Sandstone
- Gypsum bed
- Dolomite
- Cross-bedded Sandstone
- Limestone
- Cherty Limestone
- Shaly Limestone
- Sandy Limestone
- Weathered or Broken Limestone
- Loess
- Mortar bed
- Coal
- Siltstone
- Chalk
- Wavy limestone
- Chalky limestone

SOUNDINGS

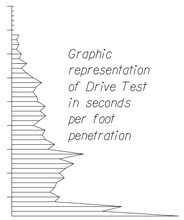
- Core drill
- Power auger
- Hand tools
- Air hammer
- Cone (CPT) penetrometer
- Shelby tube
- Water level

GEOLOGIC PROFILE

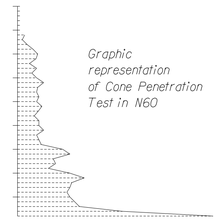
- 000.0 Elevation interpolated or from adjacent soundings
- 000.0 Actual sounding elevation

UNCONFINED COMPRESSION TEST
Elevation
Tons/sq. ft.
000.0 00
000.0 00

STANDARD PENETRATION TEST
Elevation
Blows/ft.
000.0 00
000.0 00



AIR HAMMER DRIVE TEST
Graphic representation of Drive Test in seconds per foot penetration
Scale: 1"= 100 Seconds Horiz. 1"= 10' Vert.



CONE (CPT) PENETROMETER TEST
Graphic representation of Cone Penetration Test in N60
Scale: N60.

NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are in the files of Shawnee County Public Works and and are available at their offices in Topeka, Kansas for inspection by interested and qualified bidders.

SCALE: 1"= 10' Horiz. 1"= 10' Vert.

BR. NO. OSN 332 STA. 57 + 07.55

ENGINEERING GEOLOGY
SW 107th STREET OVER ELM RUN

PROJ. NO. S-121045.00 SHAWNEE CO.

FINNEY & TURNIPSEED
TRANSPORTATION AND CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

8/4/2023
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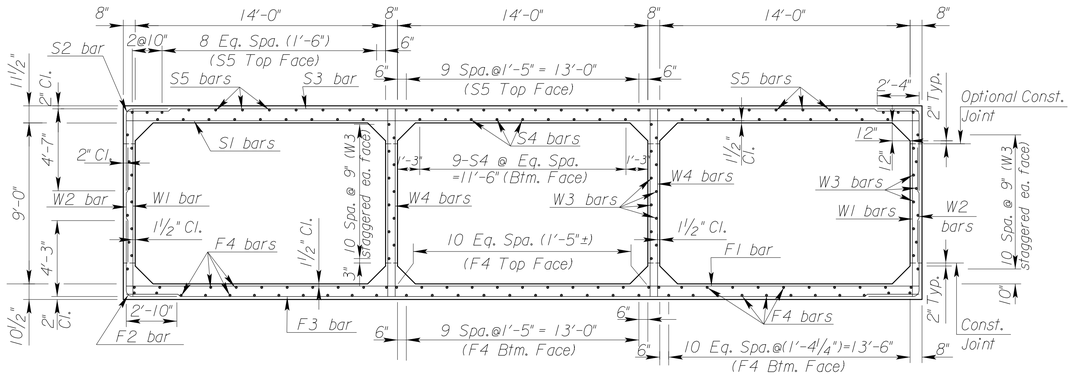
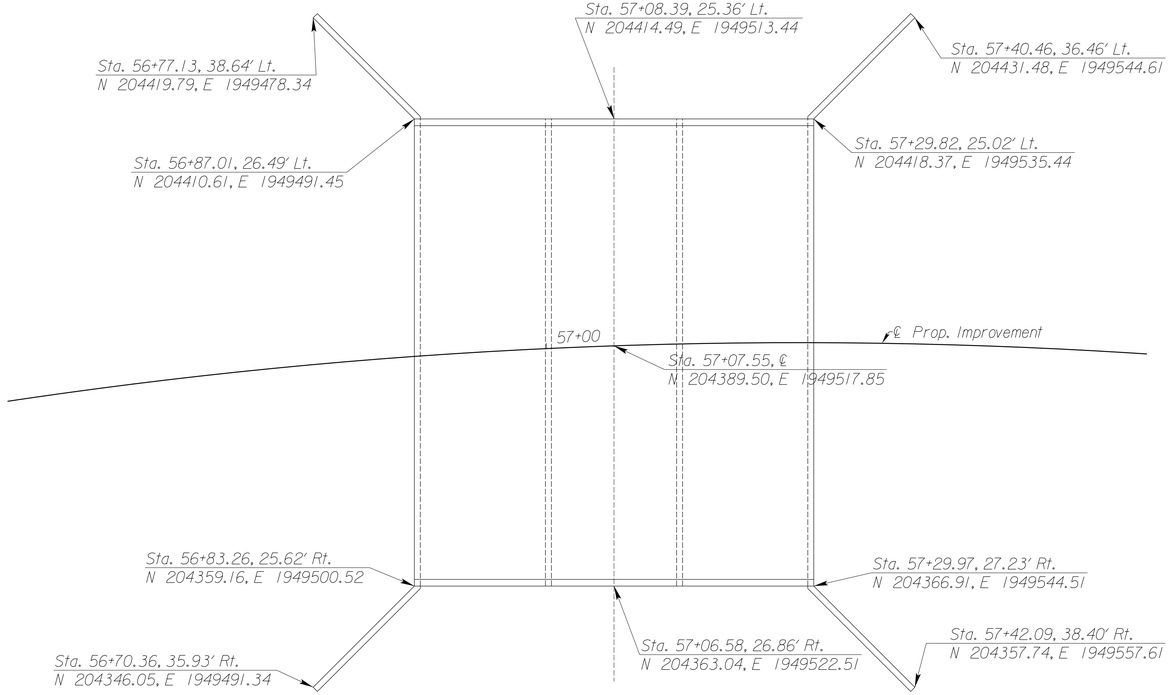
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	13	45



TYPICAL SECTION



GENERAL NOTES

DESIGN SPECIFICATION: AASHTO LRFD Spec., 2007 Ed., 2009 Int.
DESIGN LOADING: HL93
UNIT STRESSES: Grade 4.0 Concrete f'c = 4,000 p.s.i.
Reinforcing Steel fy = 60,000 p.s.i.

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Grade 4.0 Concrete. Bevel all exposed edges with a ¾" triangular molding. Where Grade 4.0(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615, Grade 60. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for RFB bridges shall be paid for as Class III Excavation.

SEAL COURSE: A seal course is required by Shawnee County. The seal course shall be unreinforced Concrete(Commercial Grade) with a minimum depth of 3 inches or as determined by the Engineer.

FOUNDATION STABILIZATION: The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor will underrun Foundation Stabilization under the unless approved by the Engineer.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

NO.	DATE	REVISIONS	BY	APP'D
1				

BR. NO. OSN 332 STA. 57+07.55

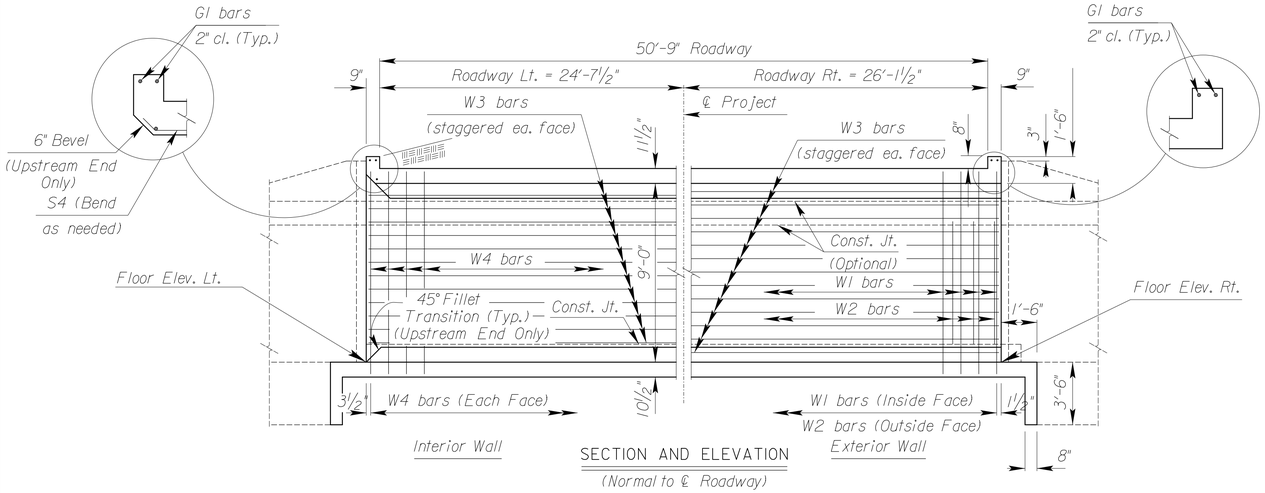
TRIPLE - 14'-0" x 9'-0" RFB
DETAILS

PROJ. NO. S-121045.00 SHAWNEE CO.

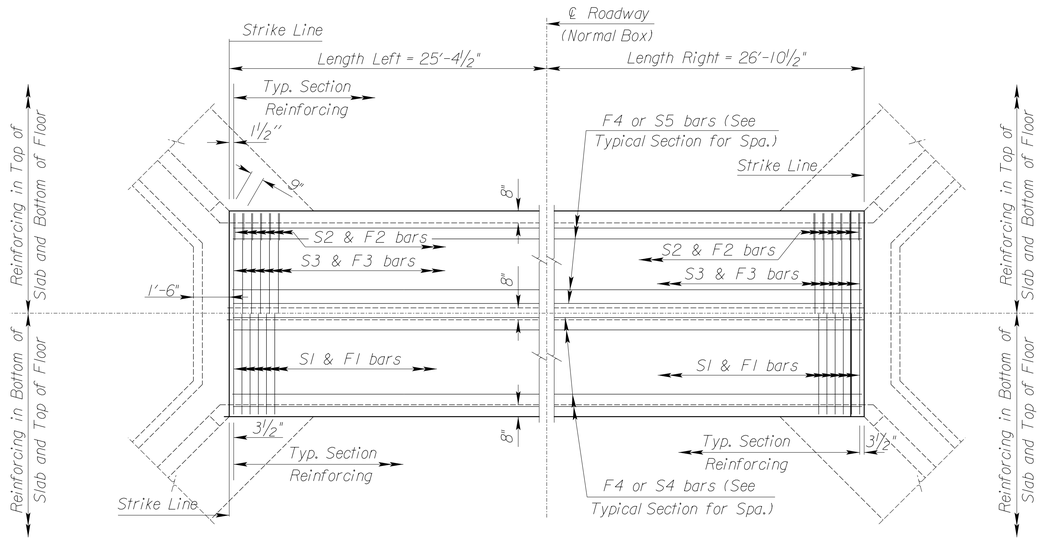
DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

Plotted By: CAM
File: 3-14x9x52-31Box1.dgn
Plot Date: 8/4/2023 4:32:40 PM
Plot Location: $UNIT$

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	14	45



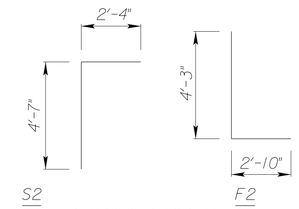
SECTION AND ELEVATION
(Normal to ℄ Roadway)



PLAN

See RCB Auxiliary Details for Optional Splice.

Note: Use only cast-in-place construction at this location.



BENDING DIAGRAM
All Dimensions are out to out of bars.

Minimum Splice Lengths	
#4	1'-5"
#5	1'-9"

▲For design purposes ONLY. Do NOT use for Construction — CULVERT SUMMARY — ◔ includes any welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	▲Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete: Barrel (Cu.Yds.)	Concrete: Wings (Cu.Yds.)	Concrete: Total (Cu.Yds.)	Reinf. Steel (Gr. 60): Barrel (Lbs.)	Reinf. Steel (Gr. 60): ◔Wings (Lbs.)	Reinf. Steel (Gr. 60): Total (Lbs.)	LRFR RATING FACTORS: HL-93 Loading: Inventory	LRFR RATING FACTORS: HL-93 Loading: Operating
850.50	850.50	867.03	2	0	Flared	Flared	No	No	229.56	28.64	258.20	59767	3850	63617	2.04	2.65

*See Bending Diagram

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 * Size	F2 * Spa.	F2 * No.	F2 * Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 * Size	S2 * Spa.	S2 * No.	S2 * Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
5	5"	125	44'-4"	7	6"	210	8'-1"	7	6"	105	44'-4"	4	65	51'-11"	8	5"	125	44'-4"	6	6"	210	6'-11"	7	6"	105	44'-4"	5	27	51'-11"	4	32	51'-11"

W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	GI Size	GI No.	GI Length
5	10"	126	10'-6"	6	1'-0"	106	6'-8"	4	88	26'-8"	7	10"	252	10'-6"	6	4	44'-4"

SUMMARY OF QUANTITIES	
Concrete (Grade 4.0)(AE)	258.2 C.Y.
Reinforcing Steel (Gr. 60)	63620 Lbs.
Foundation Stabilization	53 C.Y.
Class III Excavation	236 C.Y.

NO.	DATE	REVISIONS	BY	APP'D
1				

BR. NO. OSN 332 — STA. 57+07.55

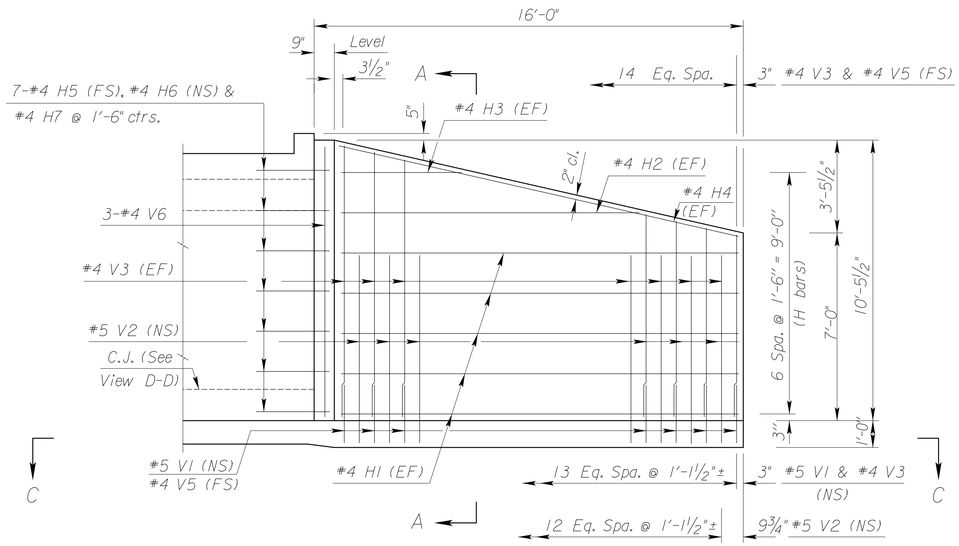
TRIPLE - 14'-0" X 9'-0" RFB
DETAILS

PROJ. NO. S-121045.00 — SHAWNEE CO.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

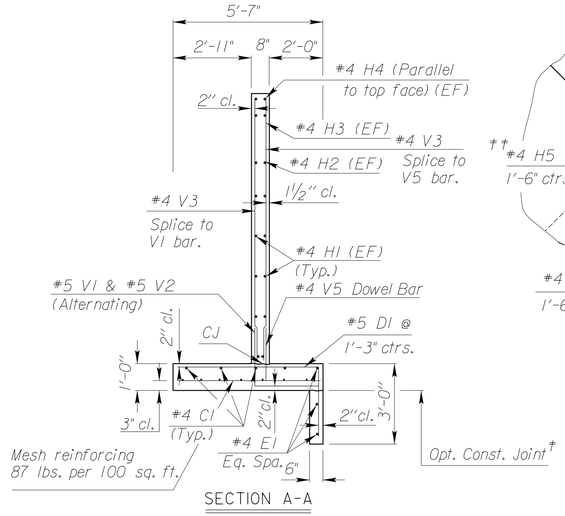
Plotted By: CAM
Plot Location: $UNIT$
File: 3-14x9x52-3(Box).dgn
Plot Date: 8/4/2023 4:32:41 PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	15	45

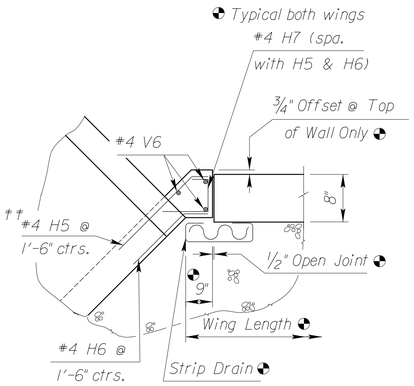


ELEVATION OF WINGWALL

(Backface Shown)



SECTION A-A

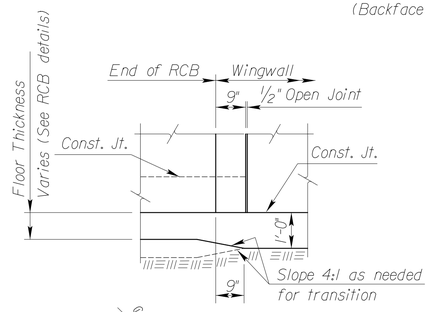


WINGWALL JOINT DETAIL

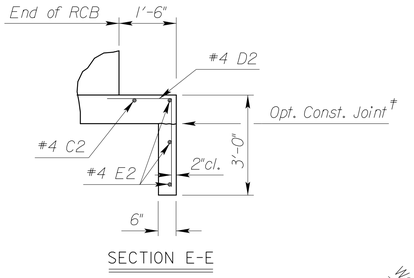
(Plan View)

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. DI bars or mesh may be spliced thus: ⌐¬ Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

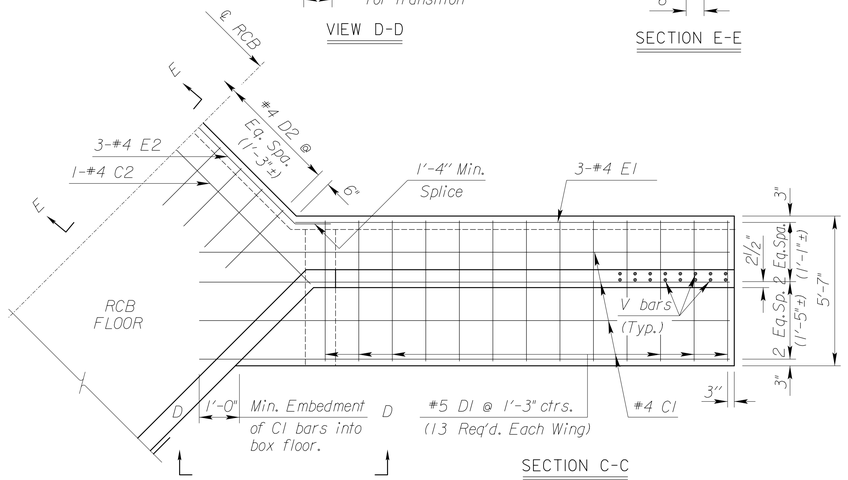
See "RCB Aux. Details" sheet for additional requirements.



VIEW D-D

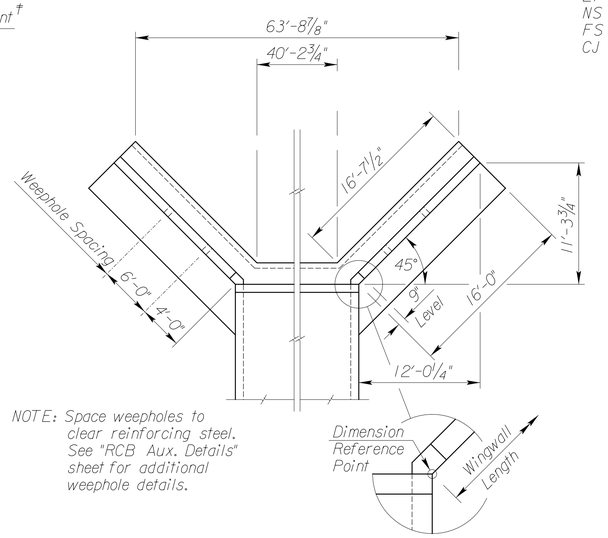


SECTION E-E



SECTION C-C

(Plan of Footing)



NOTE: Space weepholes to clear reinforcing steel. See "RCB Aux. Details" sheet for additional weephole details.

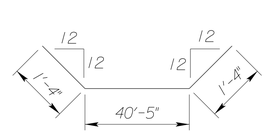
WING DIMENSIONS FOR NORMAL BOX

(3½:1 Embankment Slope)

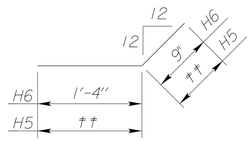
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint

Var. 6'-9" to 10'-0" by equal increments (3") — 4 Req'd. each length

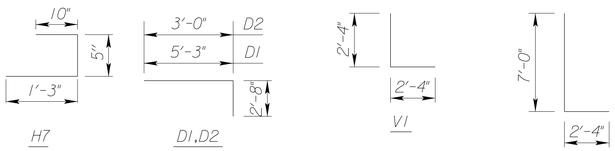
V3



E2



H5, H6



BENDING DIAGRAM

(All dimensions are out to out of bars.)

†† Bend in Field

Quantities listed below are included in the Summary of Quantities shown on the RCB details.

WINGWALL QUANTITIES (One End Only)		
	Foundation Stabilization	Concrete (Gr. 4.0)
Wingwalls	4.7 (C.Y.)	14.32 (C.Y.)
Reinforcing Steel (Gr. 60)	1770	Lbs.
Welded Wire Fabric (Wings)	155	Lbs.

NOTE: Reinforcing Bar List is for both wings at one end of box only.

* See Bending Diagram

	Mark	#4C1	#5D1	#4E1	#4C2	#4D2	#4E2	#5V1	#5V2	#4V3	#4H1	#4H2	#4H3	#4H4	#4H5	#4H6	#4H7	#4V5	#4V6
0° Skew	Number	8	26 *	6	2	33*	3 *	28 *	26 *	56	20	4	4	4	14 *	14 *	14 *	30	6
	Length	20'-0"	7'-11"	16'-3"	17'-2"	5'-8"	43'-1"	4'-8"	9'-4"	*	14'-10"	11'-1"	4'-6"	15'-3"	1'-10"	2'-1"	2'-6"	2'-2"	10'-0"

NO.	DATE	REVISIONS	BY	APP'D
2				
1				

BR. NO. OSN 332 STA. 57+07.55

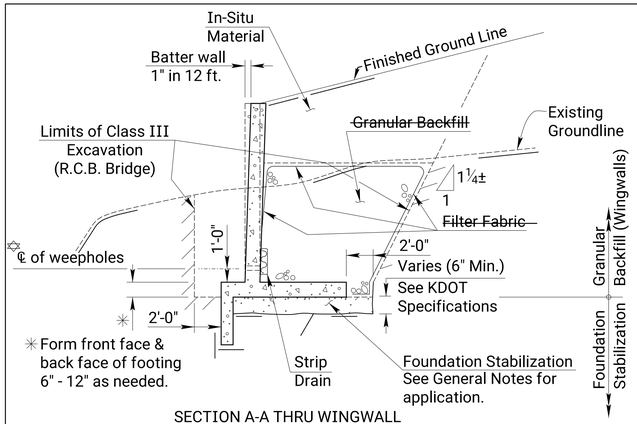
WINGWALL DETAILS

PROJ. NO. S-121045.00 SHAWNEE CO.

DESIGNED	DETAILED	QUANTITIES	CADD
DESIGN CK.	DETAIL CK.	QUAN. CK.	CADD CK.

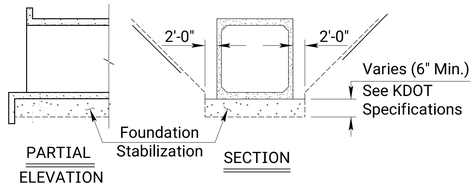
Plotted By: CAM
Plot Location: $UNIT$
File: 3-14X9 (WingS).dgn
Plot Date: 8/4/2023 4:32:44 PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	16	45



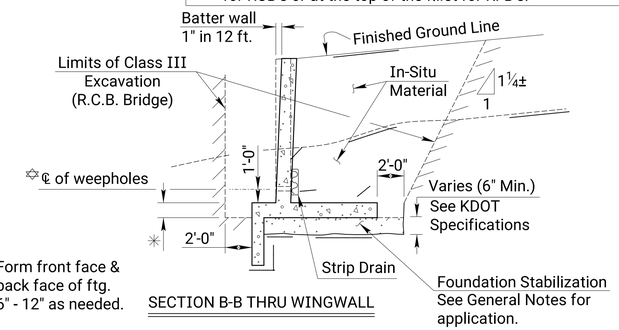
SECTION A-A THRU WINGWALL

Granular Backfill And ~~Foundation Stabilization~~

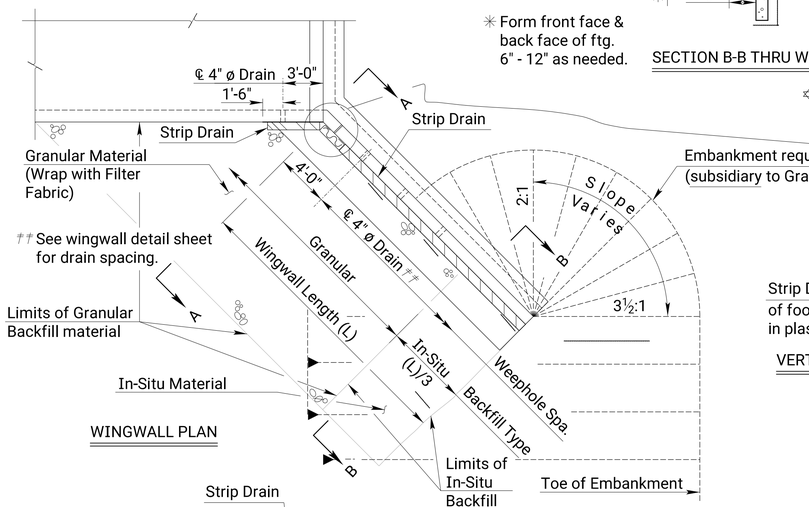


PARTIAL ELEVATION

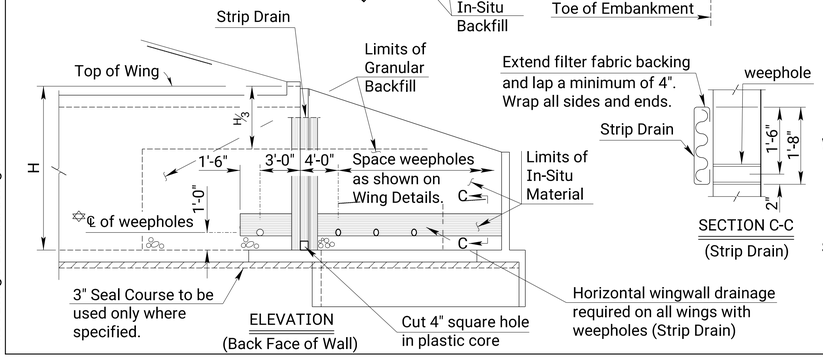
SECTION



SECTION B-B THRU WINGWALL

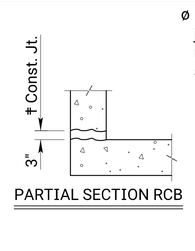


WINGWALL PLAN



ELEVATION

(Back Face of Wall)



PARTIAL SECTION RFB

OPTIONAL BAR DETAIL

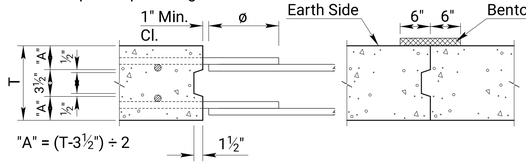
The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar laps.

† OPTIONAL COLD JOINT

The Contractor has the option of placing the Lower Horizontal Construction Joint at the top of the slab for RCB's or at the top of the fillet for RFB's.

PARTIAL SECTION RCB

ø Longitudinal bars shall extend through the joint to provide a minimum lap equal to the required splice length. See RCB Details sheet for required splice length.

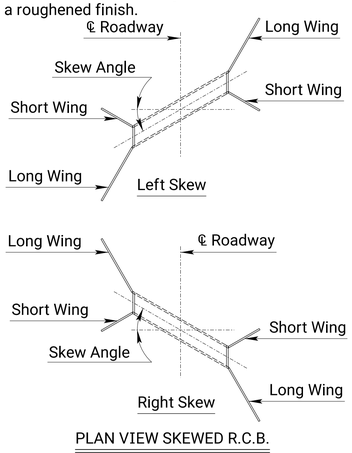


VERTICAL CONSTRUCTION JOINTS

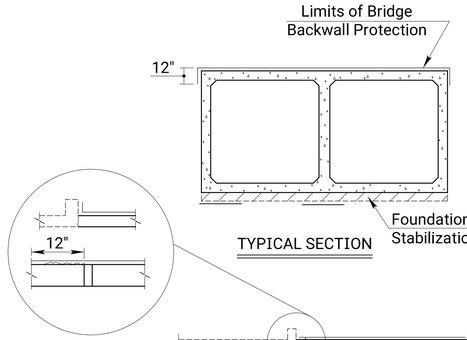
NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System". Material and installation of the bentonite system shall be subsidiary to the bid item "Grade 4.0 Concrete".



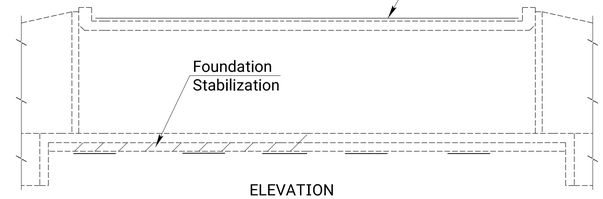
PLAN VIEW SKEWED R.C.B.



TYPICAL SECTION

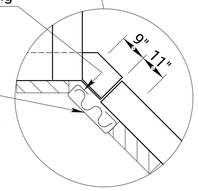
⊗ BOX EXTENSION

⊗ See "Typical Culvert Extension" RD080 for additional information.



ELEVATION

(New Construction)



VERTICAL STRIP DRAIN

SECTION C-C

(Strip Drain)

GENERAL NOTES

Wingwall Drainage:

1. All wingwalls with weepholes shall have horizontal and vertical wingwall drainage as shown. Strip drains will be used. See KDOT Specifications for "Abutment Strip Drains" for strip drain requirements.
2. Construction and materials for wingwall drainage, including weepholes, and strip drain shall be subsidiary to the bid item, "Grade 4.0 Concrete". Weepholes may be a formed opening or corrugated polyethylene tubing.

Wingwall Foundation Stabilization:
The Foundation Stabilization quantity has been calculated to the limits shown in the Section Thru Wingwall. The depth may be increased by the Engineer. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

Seal Course:
Seal Course consisting of 3" min. of Commercial Grade Concrete shall be constructed to the limits directed by the Engineer. No reinforcing in the floor of the slab or wall footing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.

✳ Weep holes will be adjusted up by the amount of embeddment shown on BR025A if the structure is embedded.

GENERAL NOTES

Foundation Stabilization:
The depth of Foundation Stabilization may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.

Granular Backfill (Wingwalls):

1. Granular Backfill shall be used to backfill behind wingwalls to the limits shown in the WINGWALL PLAN and Elevation detail. Granular Backfill construction may be used separately or combined with Foundation Stabilization as directed by the Engineer.
2. Measurement for the bid item, "Granular Backfill (Wingwalls)", shall be measured in Cubic Yards to the theoretical limits as shown.
3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of SB-1, SB-2, SCA-1 or SCA-2.
4. Consolidate Granular Backfill using hand equipment only. Avoid over consolidation.
5. Use filter fabric complying with Section 1710. Use only within the limits of Granular Backfill to separate from the In-Situ Material. Filter Fabric is subsidiary to "Granular Backfill".

In-Situ Backfill (Wingwalls):

1. Use any material found within the project limits except Highly Plastic Clay(s) or organic material. The material is subsidiary to "Granular Backfill".
2. Use Type "B" Compaction.
3. Use only hand or walk behind equipment for Compaction.

GENERAL NOTES

Bridge Backwall Protection System:

1. For all structures with less than or equal to 2'-0" of fill, apply a "Bridge Backwall Protection System" from Section 1700 to the limits shown. Do not place hot mix asphalt directly on this material.
2. Use a "non-coal tar" material from KDOT's approved list.
3. Protect this material from damage during backfilling. Repair at no additional cost.
4. When the Plans show hot mix asphalt placed directly on the slab, substitute "Pavement Water Proofing" material from Section 800, this material shall be subsidiary. Wait 28 days after top slab is completed before applying this material.

NO.	DATE	REVISIONS	BY	APP'D
07	02-06-18	Filter Fabric Clarification	M.L.L.	J.P.J.
06	06-07-17	Filter Fabric Modification	J.P.J.	J.P.J.
05	10-11-13	Granular Backfill Limits	J.P.J.	L.R.R.

KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS (LRFD)

~~BR020B~~

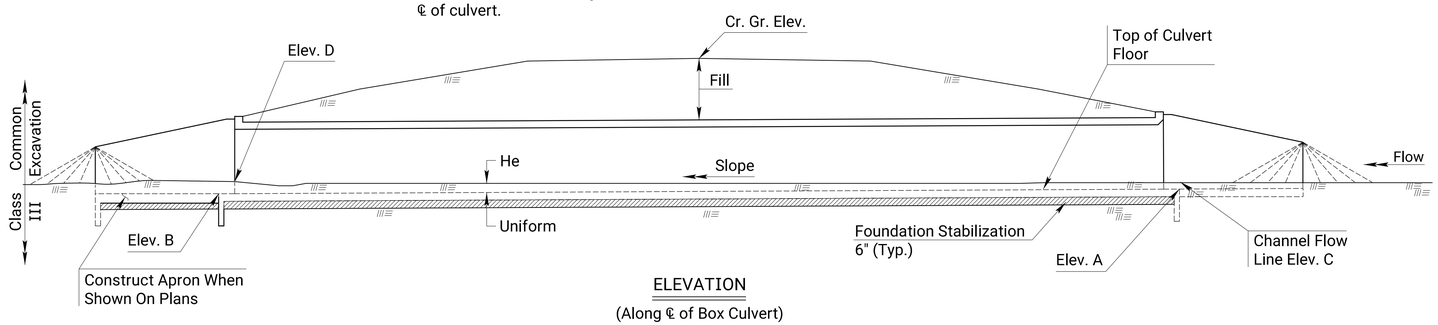
FHWA APPROVAL			04-17-10	APP'D.		Terry L. Fleck	
DESIGNED	J.P.J.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	J.S.R.	DETAIL CK.	J.P.J.	QUAN.CK.		TRACE CK.	J.P.J.

Plotted : 8/4/2023 4:32:47 PM
Drawn By : CAM
File : Bridge Standards.dgn

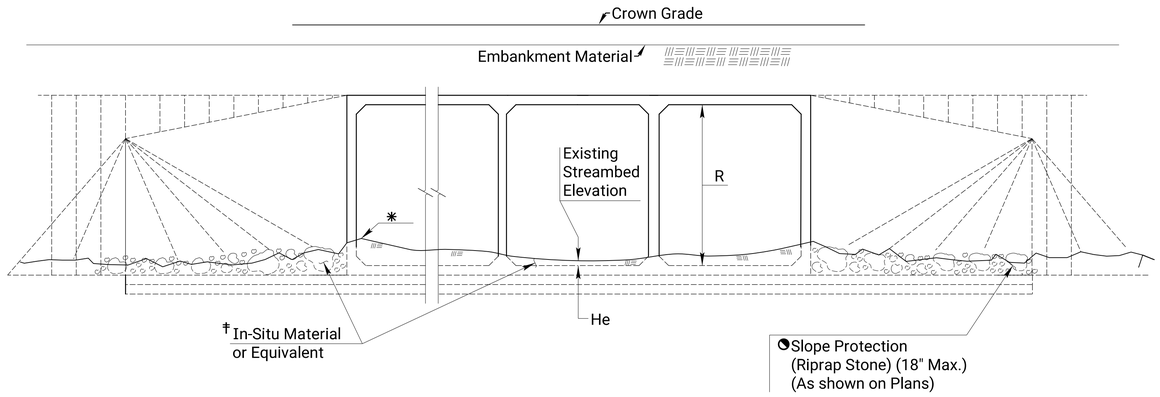
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	17	45

SUMMARY OF HYDRAULIC STRUCTURES											
Serial No.	Str. Type	Sta.	Size No. Cells - Span x Rise	Cr. Gr. Elev.	He	Floor Elev. A	Floor Elev. B	BackFill Elev. C	BackFill Elev. D	Up Stream Apron	Down Stream Apron
322	RFB	57+07.55	3 -14' x 9'	987.46	1.0	976.00	975.75	977.00	976.75	NO	NO

NOTE:
All elevations taken along
℄ of culvert.



ELEVATION
(Along ℄ of Box Culvert)



TYPICAL SECTION
(At the end of the box culvert)

GENERAL NOTES

† BACKFILL:
The backfill within the barrel will occur by natural process for structures equal to or less than 4'-0" in height. For these structures the contractor will backfill to the limits shown outside of the barrel. Backfill structures larger than 4'-0" in height to a minimum depth of 1'-0". Work and material required for backfill is not paid for directly, but is subsidiary to Foundation Stabilization.

MATERIAL:
Backfill shall be with insitu or equivalent material. Material shall be reasonably free of organic material. Slope Protection (Riprap Stone) shall conform to KDOT Specifications. Place this material to the limits shown. The intent of the Slope Protection material is to protect the toe of the embankment which wraps around the wing walls.

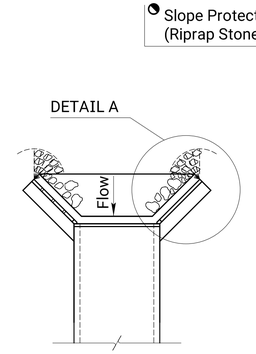
EXCAVATION:
The grading contractor will excavate and clear the channel to the limits shown on standard BR100. The bridge contractor will consider the additional excavation below this elevation as Class III for bridge sized structures. Excavation below the floor shall be subsidiary to Foundation Stabilization.

LOADING:
For structures larger than 4'-0" in height, place in-situ material or equivalent in an uncompacted state to a minimum depth of 1'-0". Do not operate equipment on floor until the concrete has reached a strength of at least 3.0 ksi.

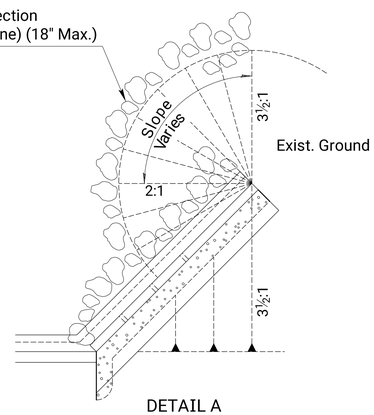
* Shape backfill in exterior cells so that top elevation of backfill material is 4" to 6" higher than the backfill material at ℄.

◔ See "RCB Box" Sheet for "Slope Protection" Quantities.

† Backfill material is limited to the material found within the footprint of the excavated structure.



PARTIAL PLAN NEAR ENDS



DETAIL A

NO.	DATE	REVISIONS	BY	APP'D
03	07-21-22	Change Shot Rock to Riprap Stone	M.L.L.	M.A.H.
02	05-06-16	Various Revisions	M.J.O.	J.P.J.
01	06-18-12	Modified per 2012 requirements	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BR. NO. OSN 332 STA. 57+07.55

RCB AUXILIARY DETAILS
(Embedded Structure)
With Rise > 48"

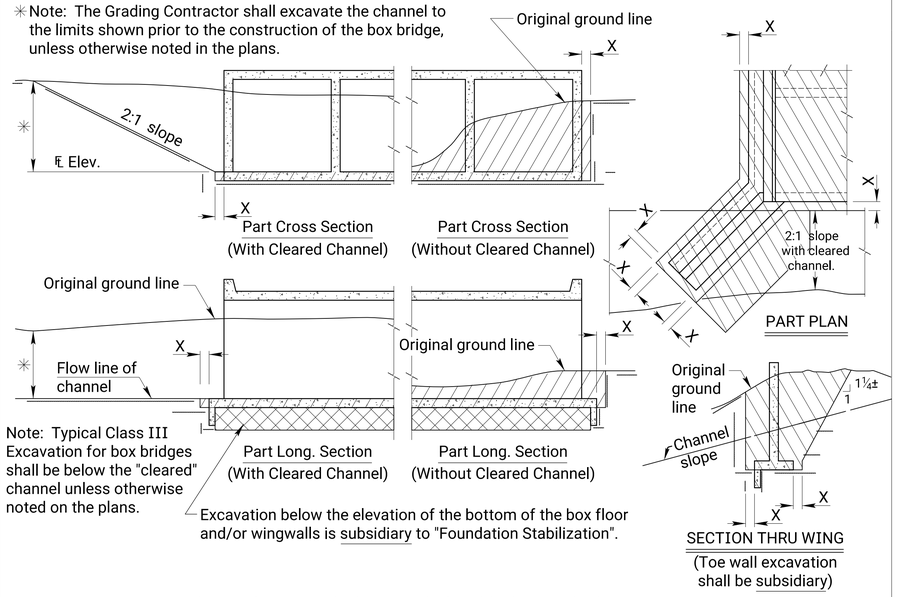
PROJ. NO. PN SHAWNEE CO.

DESIGNED	M.J.O.	DETAILED	M.J.O.	QUANTITIES		CADD	R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.		CADD CK.	

Plotted : 8/4/2023 4:32:48 PM
Drawn By : CAM
File : Bridge Standards.dgn

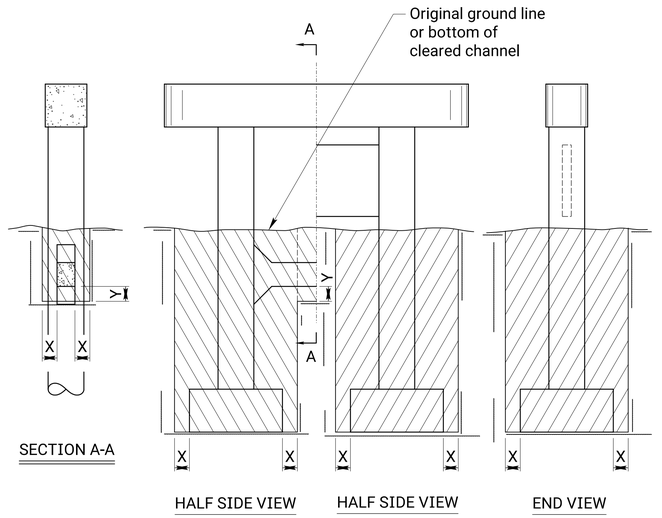
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	18	45

✳Note: The Grading Contractor shall excavate the channel to the limits shown prior to the construction of the box bridge, unless otherwise noted in the plans.



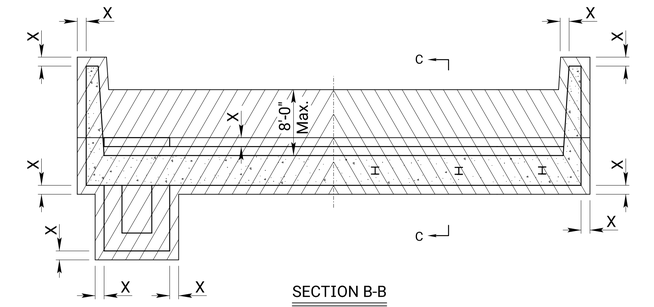
EXCAVATION DETAILS FOR REINFORCED CONCRETE BOX CULVERT

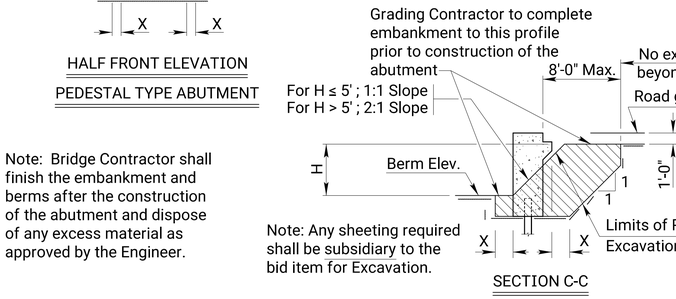
Note: Excavation for culverts less than bridge length and the additional excavation for "Embedded Structures" shall not be paid for as Class III Excavation, but shall be subsidiary to Grade 4.0 Concrete.



EXCAVATION DETAILS FOR TYPICAL PIERS

See detail when rock or shale (rock) is encountered. ⊛



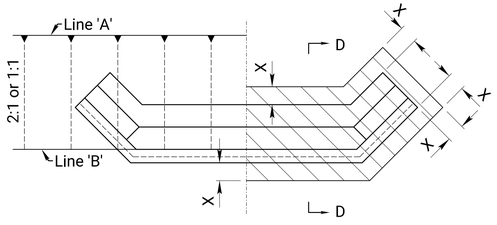


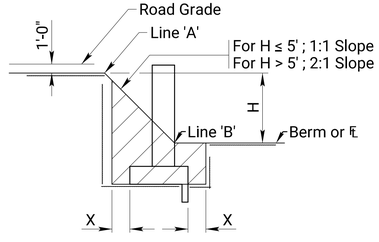
Note: Bridge Contractor shall finish the embankment and berms after the construction of the abutment and dispose of any excess material as approved by the Engineer.

Note: Any sheeting required shall be subsidiary to the bid item for Excavation.

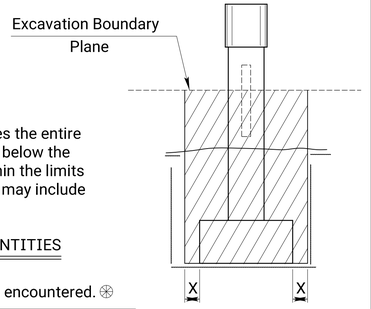
EXCAVATION DETAILS FOR TYPICAL ABUTMENTS

See detail when rock or shale (rock) is encountered. ⊛





EXCAVATION DETAILS FOR ABUTMENTS WITH FLARED WINGWALLS



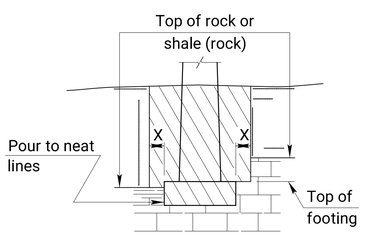
Note: Class II Excavation includes the entire volume of whatever nature found below the "Excavation Boundary Plane", within the limits specified for measurement. This may include water or air.

CLASS II EXCAVATION QUANTITIES

See detail when rock or shale (rock) is encountered. ⊛

Note: All bridge excavation shall be computed on the basis of the cross-hatch areas and boundary lines indicated on this sheet and the Excavation Boundary Plane on the Construction Layout.

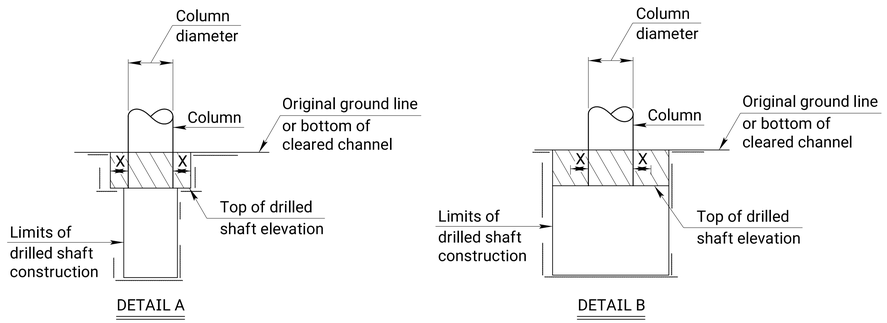
Sides of trenches in hard or compacted soil including embankments shall be shored, sheeted, braced or otherwise supported when the trench is more than 5 feet in depth and 8 feet or more in length. In lieu of the shoring, the sides of the trench above the 5 foot level may be sloped to preclude collapse. The slope for average soils shall be 1:1. If the angle of repose of the soil is less, flatter slopes shall be required.



⊛ EXCAVATION DETAIL FOR FOOTINGS IN ROCK OR SHALE (ROCK)

(Piers and Abutments)

Note: Excavation below top of rock, hard shale or below top of footing, whichever is lower, shall be to neat lines of the concrete construction.



DRILLED SHAFT DETAILS

Note: Whenever the limits of the drilled shaft construction are greater than the Column Diameter + 2X, the limits of Class I, II or III Excavation shall be the limits of the drilled shaft construction. (See Detail B)

Dimension "X" shall be 2'-0" unless indicated otherwise on the general plans.

Dimension "Y" shall be 1'-6" unless indicated otherwise on the general plans.

NO.	DATE	REVISIONS	BY	APP'D
06	08-15-12	Embedment Excavation Subsidiary	J.P.J.	T.L.F.
05	05-15-12	Revised Wing Excavation	J.P.J.	T.L.F.
04	03-03-10	Revised Wing Excavation	J.P.J.	T.L.F.

KANSAS DEPARTMENT OF TRANSPORTATION

BRIDGE EXCAVATION (LRFD)

BR100B

FHWA APPROVAL		04-17-10	APP'D.	Terry L. Fleck	
DESIGNED	DETAILED	R.D.R.	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	L.R.R.	QUAN.CK.	TRACE CK.	

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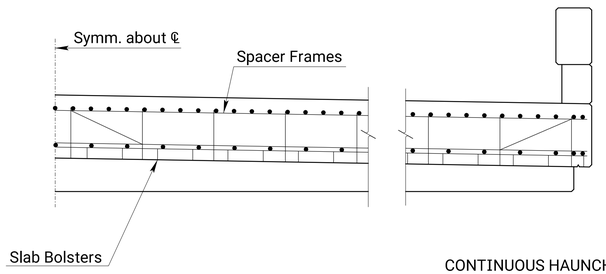
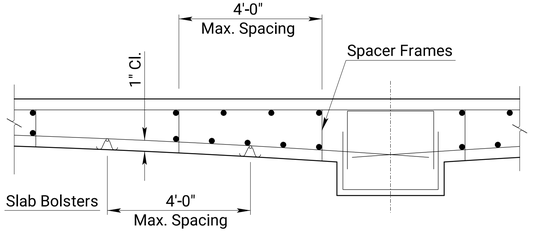
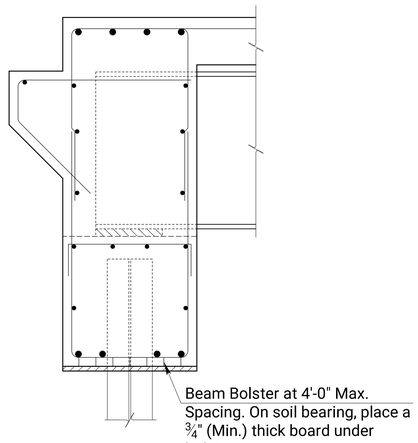
Drawn By : CAM
File : bss100b-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	19	45

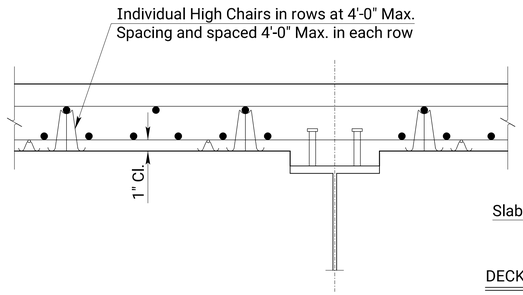


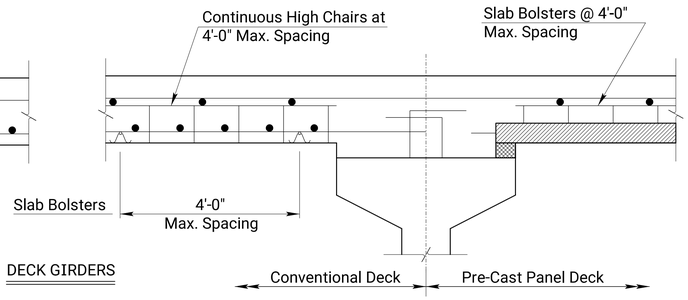


CONTINUOUS HAUNCHED SLAB

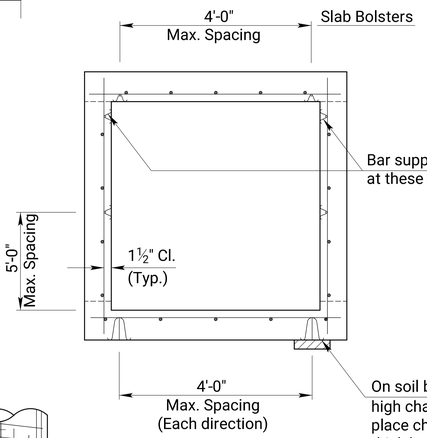


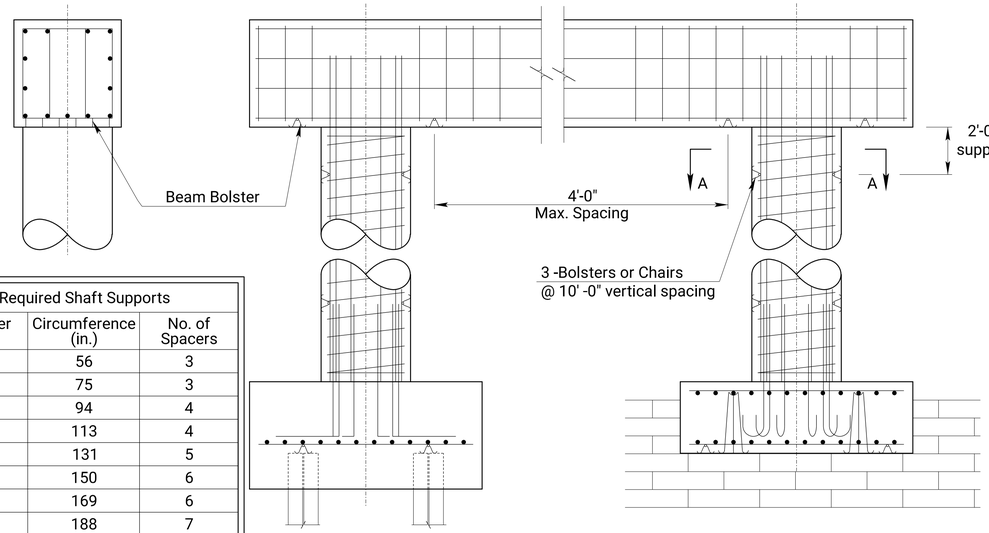
ABUTMENT





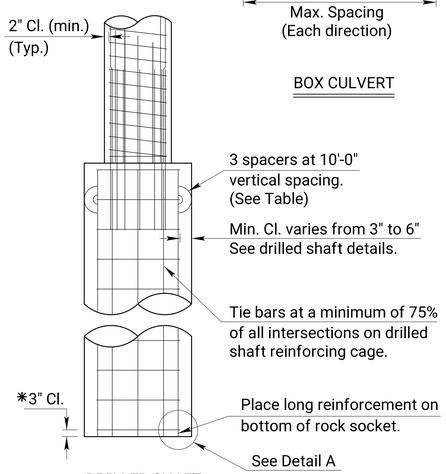
DECK GIRDERS



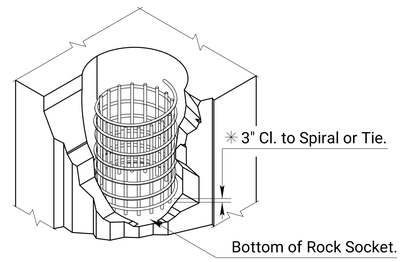


PIER

Required Shaft Supports		
Diameter (in.)	Circumference (in.)	No. of Spacers
18	56	3
24	75	3
30	94	4
36	113	4
42	131	5
48	150	6
54	169	6
60	188	7
66	207	7
72	226	8
78	244	9
84	263	9
90	282	10
96	301	11
102	320	11
108	339	12

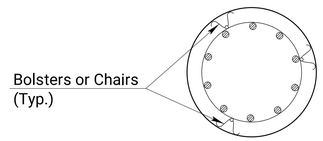


DRILLED SHAFT



DETAIL A

✳ Note: Longitudinal reinforcing steel is placed on the bottom of the rock socket. Maintain 3" clearance from the bottom of rock socket to the first spiral or tie bar.



SECTION A-A

GENERAL NOTES

Reference is made to the latest edition of the CRSI "Manual of Standard Practice" for recommended industry practices concerning reinforcing steel.

Use only the following types of bar supports:

1) Wire Bar Supports:

   a) Epoxy coated reinforcing: Class 1 Protection
   b) Non-epoxy coated reinforcing: Class 1, 2, or 3 Protection

2) Plastic Bar Supports

3) Supplementary bars

When securing epoxy coated reinforcement, use tie wires or metal clips that are epoxy or plastic coated.

Do not weld reinforcing steel to bar supports or to other reinforcing steel. Shop weld spacer frames for haunched slabs.

Tie bars at all intersections around the perimeter of each mat and at not less than 2'-0" centers or at every intersection, whichever is greater.

Where more than one length of bar support is required, lap the end legs so they are locked or tied together.

Use proper height supports to maintain the distance between the reinforcing and the formed surface or the top surface of deck slabs within ¼" of that indicated on the plans.

Spacings shown are maximums. Use sufficient supports, as determined by the Engineer, to retain the reinforcing steel in position.

Construct any platforms, required for the support of workers and/or equipment during concrete placement, directly on the forms and not on the reinforcing steel.

Designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer.

NO.	DATE	REVISIONS	BY	APP'D
05	11-10-10	Column Bar Supports Required	J.P.J.	T.L.F.
04	12-01-05	Drilled Shaft Spiral Steel Placement	J.P.J.	K.F.H.
03	08-21-00	Added Pre-Cast Panel Detail	R.A.M.	K.F.H.

KANSAS DEPARTMENT OF TRANSPORTATION

SUPPORTS AND SPACERS FOR REINFORCING STEEL

BR120

FHWA APPROVAL			11-17-10	APP'D.		Terry L. Fleck	
DESIGNED	R.A.M.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	L.R.R.	DETAIL CK.	R.A.M.	QUAN.CK.		TRACE CK.	R.A.M.

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File : bss120-01.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	20	45

††REMOVAL OF EXISTING STRUCTURES

Description
℄ Proposed Imp.:
Sta. 53+50, Rt. to Sta. 56+14.5, Lt., woven/barb wire fence
Sta. 56+41 to Sta. 56+72, 8' Lt., 15"x31' corrugated metal pipe
Sta. 56+23, 1' Rt. to 42' Rt., stone fence
Sta. 57+06, 23' Lt., Remove 12' simple concrete span, concrete/ masonry abutments. Concrete deck, 16'-6" Roadway
Sta. 57+00 to Sta. 57+45, Rt., barb wire fence
Sta. 57+58, 15' Rt., 12"x18' corrugated metal pipe
Sta. 57+67 to Sta. 60+25, Rt., barb wire fence
Sta. 57+33 to Sta. 60+25, Lt., barb wire fence
℄ Side Road:
Sta. 9+95 to Sta. 12+75, Rt., woven/barb wire fence
Sta. 10+90 to Sta. 12+47, Lt., barb wire fence

†† Any structure or item not specifically listed that interferes with new construction shall be removed. This work is subsidiary to the bid item Removal of Existing Structures.

DRAINAGE STRUCTURES

STATION	SIDE	SIZE	TYPE	CSP LIN. FT. 15"	CSP LIN. FT. 24"	CSP LIN. FT.	RCP LIN. FT. 15"	RCP LIN. FT. 24"	RCP LIN. FT.	END SECTION(CS) EACH 15"	END SECTION(CS) EACH 24"	END SECTION(RC) EACH 15"	END SECTION(RC) EACH 24"	REMARKS
56+35	Lt.	24"	Culvert/CRP					50					2	
56+35	Rt.	24"	Culvert/CRP					58					2	
59+50	Rt.	15"	Culvert/EP	30						2				
TOTALS				30				108		2			4	

CLASS I STONE RIPRAP

STATION	SIDE			QUANTITY (SQ. YDS.)
Sta. 55+51 to 56+16	Lt.			129.6
Sta. 55+72 to 56+04	Rt.			60.7
Sta. 11+28 to 11+38, ℄ S.R.	Rt.			15.0
TOTAL				205.3

REMOVE LARGE TREES

Location, Size	Quantity (Each)
Sta. 53+66, 35' Rt.	1
Sta. 53+69, 35' Rt.	1
Sta. 53+72, 35' Rt.	1
Sta. 55+77, 32' Rt.	1
Sta. 55+90, 56' Rt.	1
Sta. 56+06, 84' Rt.	1
Sta. 56+25, 02' Lt.	1
Sta. 56+26, 86' Rt.	1
Sta. 56+27, 99' Rt.	1
Sta. 56+29, 144' Rt.	1
Sta. 57+03, 38' Rt.	1
Sta. 57+06, 12' Rt.	1
Sta. 57+10, 10' Rt.	1
Sta. 57+13, 09' Rt.	1
Sta. 57+18, 08' Rt.	1
Sta. 57+28, 91' Rt.	1
Sta. 57+31, 63' Lt.	1
Sta. 57+33, 27' Rt.	1
Sta. 57+36, 37' Rt.	1
Sta. 57+40, 25' Rt.	1
Sta. 57+84, 26' Rt.	1
Sta. 58+02, 43' Rt.	1
Sta. 58+10, 37' Rt.	1
Sta. 58+45, 24' Rt.	1
Sta. 58+71, 30' Rt.	1
Sta. 58+74, 29' Rt.	1
Total	26

PAVEMENT REMOVALø

LOCATION	QUANTITY (SQ. YDS.)
Sta. 53+50, ℄ Prop. Imp. to Sta. 8+25, ℄ S.R.	991
TOTAL	991

øAreas of Pavement Removal exterior to roadway cross section work, shall be filled to existing grade following removal of the pavement. Embankment quantities for this work are included with SW 107th St. quantities.

RECAPITULATION OF ROAD QUANTITIES

ITEM	QUANTITY	UNIT
Mobilization	L.S.	Lump Sum
Field Office & Laboratory (Type B)	1	Each
Contractor Construction Staking	L.S.	Lump Sum
Removal of Existing Structures	L.S.	Lump Sum
Clearing & Grubbing	L.S.	Lump Sum
Remove Large Trees	26	Each
Pavement Removal	991	Sq. Yd.
Unclassified Excavation	3,081	Cu. Yd.
Rock Excavation	115	Cu. Yd.
Embankment	2,484	Cu. Yd.
Supplementary Borrow Material	231	Cu. Yd.
Class I Stone Riprap	205	Sq. Yd.
15" Culvert(CSP), 16 gauge	30	L.F.
24" Culvert(RCP), Class II	108	L.F.
15" End Section(CS)	2	Each
24" End Section(RC)	4	Each
Object Marker (Type 3)	4	Each

For Bridge Quantities See Sheet Nos. 9
For Surfacing Quantities See Sheet No. 21
For Temporary Project Water Pollution Control Quantities See Sheet No. 22
For Seeding Quantities See Sheet No. 32
For Traffic Control See Sheet No. 38

EARTHWORK

STATION to STATION	EXCAVATION UNCLASSIFIED CU.YDS.	UNCLASSIFIED VMF	ROCK CU.YDS.	ROCK VMF	SUPPL. BORROW CU.YDS.	EMBANKMENT TYPE AA MR-5-5 CU.YDS.	EMBANKMENT TYPE A MR-5-5 CU.YDS.		THROUGH CUTS NOT SUBGRADED COMM. CU.YDS.	THROUGH CUTS NOT SUBGRADED TYPE AA CU.YDS.	THROUGH CUTS NOT SUBGRADED TYPE A CU.YDS.	EMBANKMENT (CU.YDS.) INITIAL CONSOL.	EMBANKMENT (CU.YDS.) SETTLE-MENT	PLACE SELECT SOIL CU.YDS.
53+25 to 60+50, 107th	962	0.75	115				1,308							
8+00 to 13+00, Wanamaker	580						893							
Clear Channel	1,539						283							
TOTALS	3,081		* 115		231		2,484							

* To be wasted

NO.	DATE	REVISIONS	BY	APP'D
2	1-14-08	Rem. Drainage Structure summary	S.W.K.	J.O.B.
1	1-9-91	Detailed on CADD	R.J.S	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES

~~RD050~~

FHWA APPROVAL	5-28-08	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. S.W.K.

Drawn By : CAM Plotted : 8/4/2023 4:32:57 PM
File : Summary of Quantities - Road.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	21	45

GENERAL NOTE:

On surfacing projects, the 6" of Compaction Type AA, shown for the center portion on the roadbed, is for the purpose of restoring the original Compaction Type AA which may have been lost since grading operations. The exact locations of this Compaction Type AA, which will be required, is to be determined by the Engineer at the time of construction. This work shall be paid under the bid item "Compaction of Earthwork (Type AA) (MR-)".

Over all structures, unless otherwise directed by the Engineer, where the top of the hubguard is level with or above the finished shoulder grade, the earth cover over the structure slab shall be removed and backfilled with_____material as directed by the Engineer. The removal of this material will be subsidiary.

The_____material used to backfill over the structure shall be paid for at the prices shown in the contract.

The earth shoulders shall be compacted full depth (Type -MR) except, when ordered by the Engineer, the top 3" shall be left uncompacted for seeding.

All side roads and house entrances shall be surfaced with_____ to the R/W line as indicated on the detail. All side roads and house entrances with existing asphalt surface shall be surfaced with_____at least to the R/W line or to the end of construction, as directed by the Engineer. Each mailbox turnout (ON PROJECTS WHERE STABILIZED SHOULDERS ARE NOT SPECIFIED) shall be surfaced with_____to the limits shown on the detail.

Surfacing material (SA-_____) shall be used for surfacing house entrances and side roads (_____C.Y./SQ. YD.) beyond the limits of the asphalt surface to the limits of construction as determined by the Engineer.

The thickness of side road and entrance surfacing may be increased to the same thickness as the stabilized shoulder within the approximate limits of the shoulder.

On projects which specify both asphalt base and surface course materials, side roads, house entrances and mailbox turnouts may be surfaced with both materials at the contractors option, with the approval of the Engineer.

Quantities for aggregate for shoulders, AS-1, are calculated on the basis of 150 lbs. per cu. ft. Quantities for stabilized base course, AB-3, are calculated on the basis of 156 lbs. per cu. ft. Weight/cu. ft. includes moisture allowed by specification.

The base course shall be constructed to the plan thickness as shown.

Thicknesses indicated for all construction which is paid for on a weight or volume basis are approximate and may vary to correct for unevenness in the foundations or for other normal unevenness encountered in placement operations.

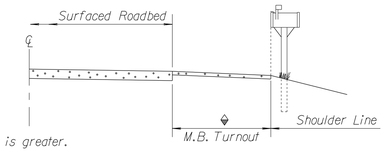
A tack coat of SS-1HP shall be provided between each lift of all base courses and surface courses and under the first lift of base or surface courses when they are placed on an existing asphalt, brick, or concrete surface, when so ordered by the Engineer and at the rate designated by him. Quantities are included for these tacks calculated at the rate of 0.05 gal./sq. yd.

Asphalt Material quantities are calculated on the basis of 8.328 lbs. per gal.

Shoulder rumble strips will not be constructed as part of this project.

SUMMARY OF QUANTITIES

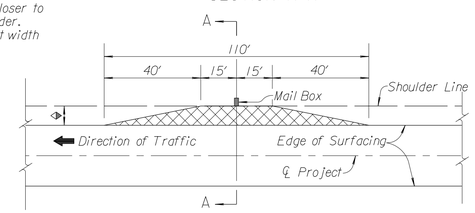
ITEM	tons
Crushed Rock Surfacing (AB-3)	
Sta. 53+50 to Sta. 60+25 (Mainline)	649.0
Sta. 8+25 to Sta. 12+75 SW (Wanamaker)	437.0
Totals	1,086.0



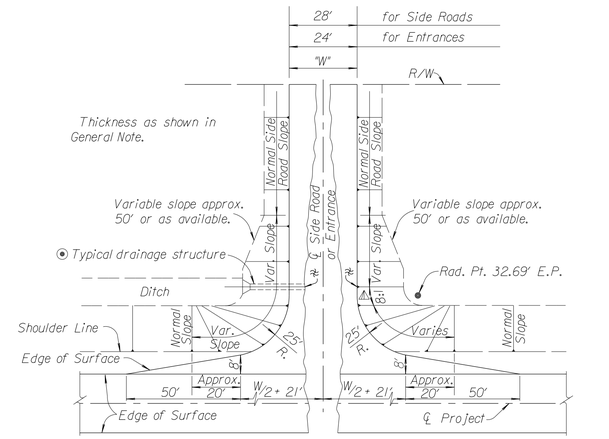
◈ Width shall be 8' or shoulder width, whichever is greater.

SECTION A-A

Note: The face of Mail Box should be no closer to the roadway than the edge of the shoulder. Align with edge of turnout when turnout width is greater than shoulder width.

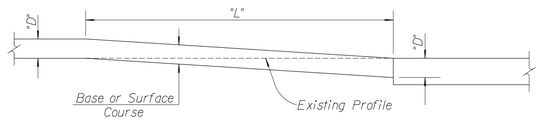


DETAIL FOR SURFACING OF MAIL BOX TURNOUTS



WITH DRAINAGE STRUCTURE MOUND ENTRANCE OR SIDE ROAD

DETAIL FOR SURFACING OF SIDE ROADS & HOUSE ENTRANCES



TYPICAL PROFILE AT GRADE CONTROL POINTS

The Contractor shall cut the subgrade in accordance with this profile at all grade control points, i.e.; existing pavements, grade bridges and R.R. crossings, also at changes in thickness of base or surface courses. Corresponding dimensions of "D" and "L" shall be as given in the table below.

The work of cutting the subgrade and disposing of excess excavated material shall be subsidiary to other items in the contract.

TABLE OF DIMENSIONS

D	L	D	L	D	L	D	L	D	L	D	L
1"	25'	3"	75'	5"	125'	7"	175'	9"	225'	11"	275'
2"	50'	4"	100'	6"	150'	8"	200'	10"	250'	12"	300'

RATES OF APPLICATION

RATE	UNIT	ITEM
156	lbs/ft³	Crushed Rock Surfacing (AB-3)(6")

RECAPITULATION OF QUANTITIES

ITEM	TOTAL	UNIT
Crushed Rock Surfacing (AB-3)	1,086	tons

⚠ 8:1 Slope at the appropriate clear zone shall apply to all mound entrances and mound side roads to 10' fill height. Normal Slope (but not steeper than 6:1) for over 10' fill height.

⊙ Normal Slope (but not steeper than 6:1) at approximate ℄ Structure or appropriate clear zone width.

* On side roads and entrances which slope toward the highway, a low point approx. 6" deep shall be constructed to divert surface drainage into the highway ditch, unless otherwise shown on the plans.

NO.	DATE	REVISIONS	BY	APP'D
12	1-10-07	Changed bituminous to asphalt	S.W.K.	J.O.B.
11	8-30-06	Changed tack type/rate	S.W.K.	J.O.B.
10	3-24-05	Revised compaction, tack type/rate	S.W.K.	J.O.B.
9	6-12-02	Added low point off shoulder.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

SUMMARY OF QUANTITIES (Surfacing)

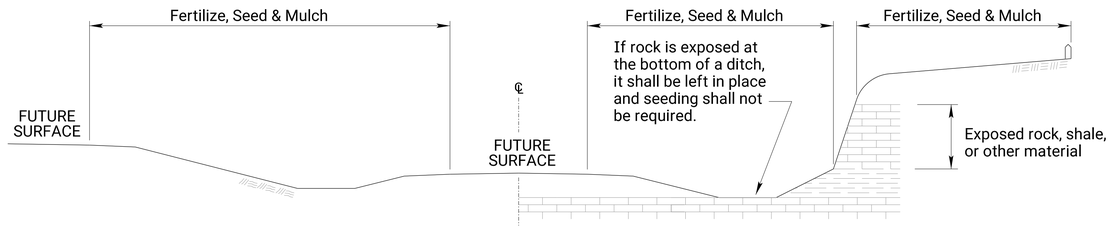
~~RD051~~

FHWA APPROVAL	9-06-06	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Hecht

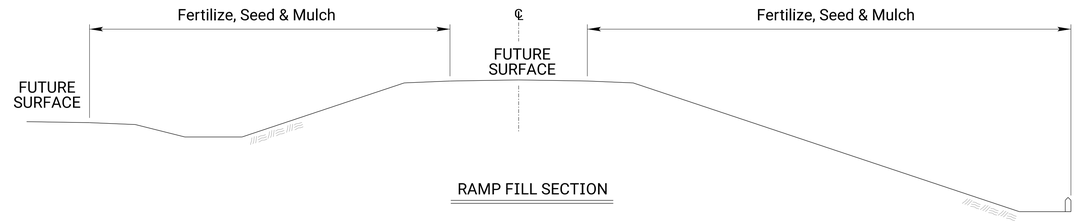
Sht. No. 21

Drawn By : CAM
File : Surfacing Summary.dgn
Plotted : 8/4/2023 4:33:00 PM

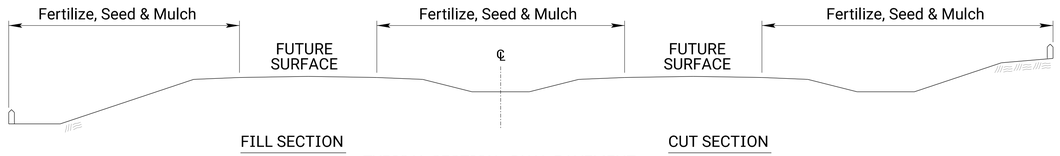
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	22	45



RAMP CUT SECTION



RAMP FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5, K_2O listed in Summary of Quantities will be acceptable.

* - N = Nitrogen Rate of Application
** - P_2O_5 = Phosphorous Rate of Application
*** - K_2O = Potassium Rate of Application

The Contractor will be required to finish areas of excavation, borrow and embankment in accordance with the specifications. Areas that require installation or construction of temporary water pollution control items will be finished in reasonable close conformity to the alignment, grade and cross section shown on the plans or as established by the Engineer.

CLT = Construction Limit Tract. This area is defined by the entire disturbed area of the project that requires seeding and erosion control measures to be placed. Any impervious areas (i.e. pavement, gravel, riprap, etc.) shall not be included in this measurement.

Slope = Defined by the area of the project that requires Class 1 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

Channel = Defined by the area of the project that requires Class 2 erosion control material to be placed. This area shall be seeded using the Soil Erosion Mix prior to placement of the material. Drilling seed is preferred, however, broadcasting is acceptable if drilling is not possible.

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded, and mulched. Soil preparation shall conform to the Standard Specifications.

Temporary seeding shall be done during any time of the year that the soil can be cultivated. After the temporary seeding has been completed on the entire project, permanent seeding shall be done during the normal seeding season.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching materials is generally as follows:

1¾ - 2¼ Tons per Acre = 1½" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

SUMMARY OF SEEDING / EROSION CONTROL QUANTITIES

P.L.S. RATE/ ACRE		ACRES		BID ITEM	QUANTITY	UNIT
CLT	SL/CH	CLT	SL/CH			
150		1.01		Temporary Fertilizer (15 - 30 - 15)	15	LB
20		1.01		Temporary Seed (Canada Wildrye)		LB
45		1.01		Temporary Seed (Grain Oats)		LB
45		1.01		Temporary Seed (Sterile Wheatgrass)		LB
				Soil Erosion Mix	111.1	LB
				Erosion Control (Class 1, Type C)	486	SQ YD
				Erosion Control (Class 2, Type Y)		SQ YD
				Sediment Removal (Set Price)		CU YD
				Synthetic Sediment Barrier		LF
				Temporary Berm (Set Price)		LF
				Temporary Ditch Check (Rock)		CU YD
				Temporary Inlet Sediment Barrier		EACH
				Temporary Sediment Basin		CU YD
				Temporary Slope Drain		LF
				Temporary Stream Crossing		EACH
				Biodegradable Log (9")		LF
				Biodegradable Log (12")		LF
				Biodegradable Log (20")	200	LF
				Filter Sock (18")	200	LF
				Geotextile (Erosion Control)	1,200	SQ YD
				Silt Fence	200	LF
				SWPPP Design ✝		LS
				SWPPP Inspection ✝		EACH
				Water Pollution Control Manager ✝		EACH
900 lbs / acre				Mulch Tacking Slurry		LB
2 tons / acre						
				Temporary Seeding and Mulching	1.01	ACRES

NOTE: Projects shall be bid as "Temporary Seeding and Mulching" by the acre. All disturbed areas shall be seeded, fertilized and mulched at the listed rate per acre. The acres are estimated.

Geotextile (Erosion Control) shall be removed prior to placement of permanent slope protection.

Regreen and Quick Guard are the approved sterile wheatgrass products.

**** List size of material.

The amount of mulch and mulch tacking slurry in the bid quantities is estimated. (Acres of Seeding X 1.5 X 2 Tons/Acre). The estimated quantity includes mulching associated with both temporary and permanent seeding operations. The total mulch and mulch tacking slurry required shall be determined in the field. The bid item for mulching and mulch tacking slurry shall be paid for according to the Standard Specifications.

Quantities for all erosion control items are estimated to give full flexibility for compliance with the NPDES permit. Final quantities will be determined in the field.

SOIL EROSION MIX

PLS RATE	NAME	QTY (lb)
0.5	Blue Grama Grass Seed (Lovington)	0.51
4.5	Buffalograss Seed (Treated)	4.55
45	Perennial Ryegrass Seed	45.5
2.6	Prairie Junegrass Seed	2.63
6.3	Side Oats Grama Grass Seed (El Reno)	6.36
45	Tall Fescue (Endophyte Free)	45.5
6	Western Wheatgrass Seed (Barton)	6.06
109.9	Total (lb)	111.1

The Soil Erosion Mix is to be placed under the Class 1 and/or Class 2 erosion control material.

The Soil Erosion Mix consists of the Shoulder Area of the Permanent Seed Mix used on the project.

NO.	DATE	REVISIONS	BY	APP'D
03	08-03-20	Added Note	M.R.D.	M.L.
02	12-01-17	Revised Standard	M.R.D.	S.H.S.
01	06-01-17	Revised Standard	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL

LA852A

FHWA APPROVAL		01-26-18	APP'D.	Scott H. Shields	
DESIGNED	M.R.D.	DETAILED	M.R.D.	QUANTITIES	TRACED
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.	TRACE CK.

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Drawn By : CAM
File : Erosion Stds 2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	23	45

EROSION CONTROL- CLASS I, TYPE C

STATION TO STATION	SIDE	LENGTH	WIDTH	SQ YARD
56+08 to 56+21	LT.	24.2	9.2	24.7
56+08 to 56+21	RT.	21.3	9.7	23.0
56+48 to 56+61	LT.	14.7	16.3	16.6
56+48 to 57+55	RT.	132.0	16.7	244.9
56+59 to 57+50	LT.	91.0	17.5	176.9
TOTAL EROSION CONTROL (CLASS I, TYPE C) = 486 SQ. YDS.				

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

EROSION CONTROL SEEDING-SODDING

LA852A-EC

FHWA APPROVAL				APP'D.		Scott H. Shields	
DESIGNED	M.R.M.	DETAILED	M.R.M.	QUANTITIES		TRACED	M.R.M.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

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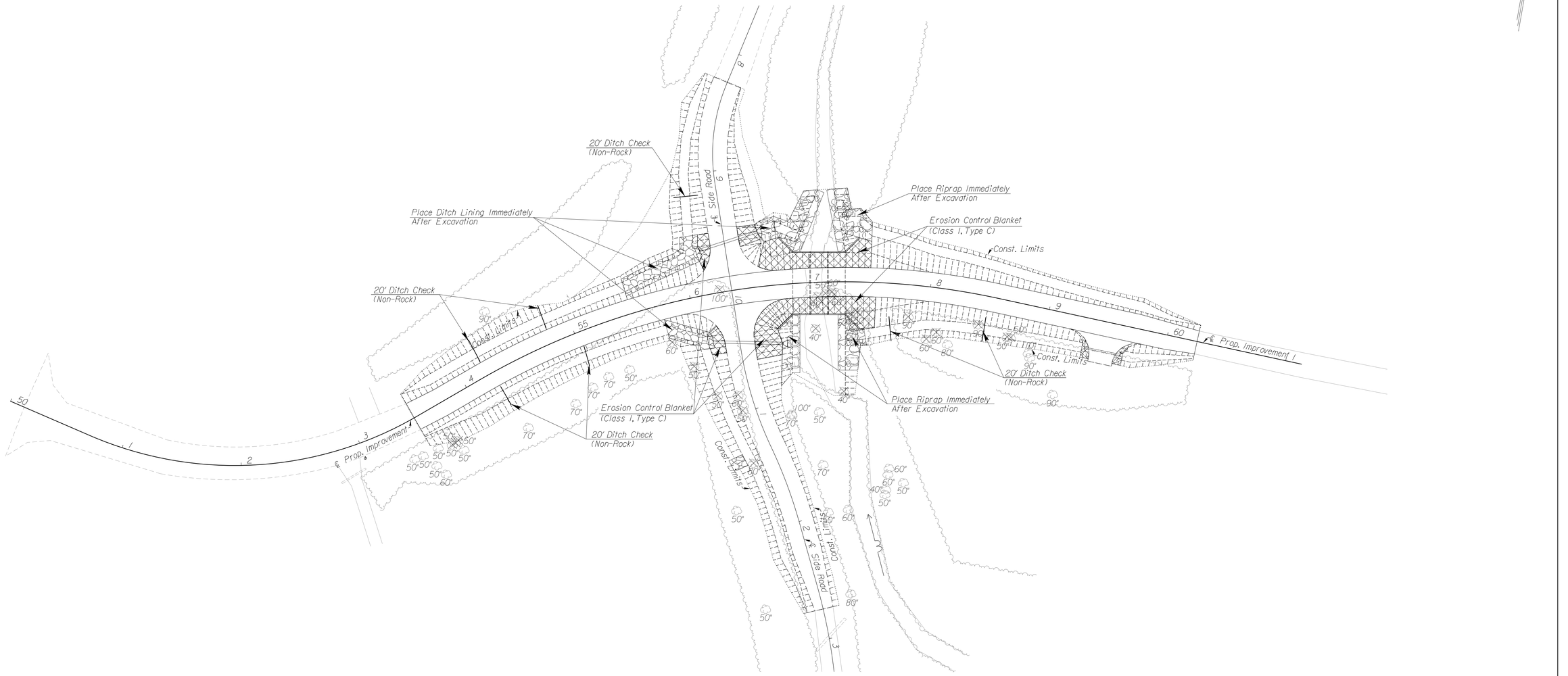
Drawn By : CAM
File : Erosion Stds 2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	24	45

Seeding Area= 1.01 Acres

Total Disturbed Area in CLT = 1.72 Acres

NOTE: All disturbed areas with no activity on them for 14 calendar days or more shall be temporarily seeded & mulched.



8/4/2023
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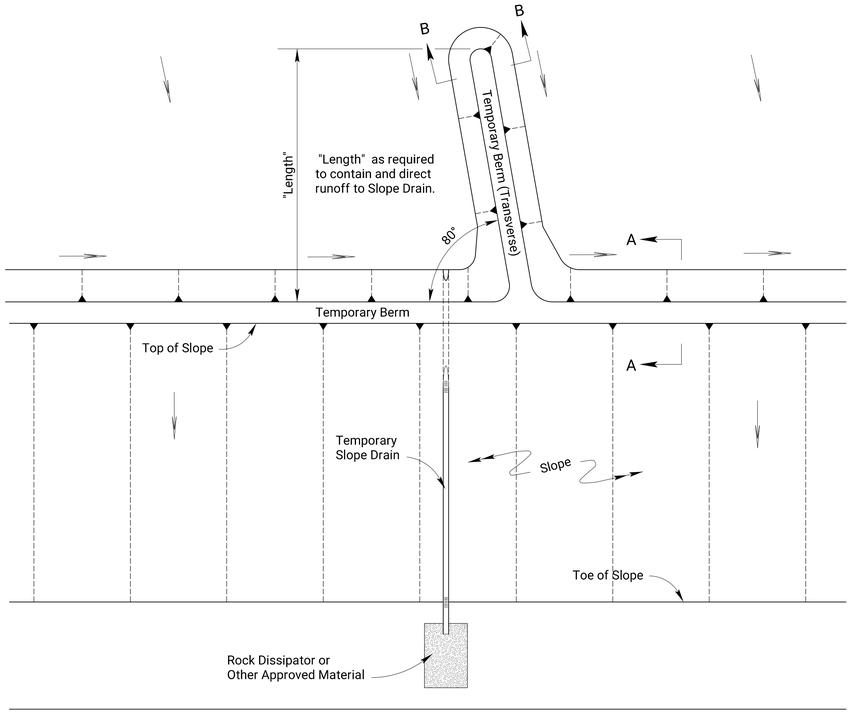
Y:\County\Shawnee\SW 107th Trib to Wakarusa\SWWP Plan 107th.dgn

PROPOSED EROSION CONTROL PLAN

PROJ. NO. S-121045.00 SHAWNEE CO.

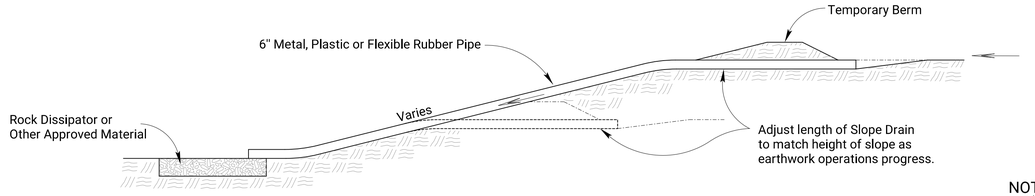
FINNEY & TURNIPSEED
TRANSPORTATION & CIVIL ENGINEERING, L.L.C.
TOPEKA, KANSAS

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	25	45



TYPICAL PLAN VIEW OF TEMPORARY BERM AND TEMPORARY SLOPE DRAIN

NO SCALE



TYPICAL PROFILE OF TEMPORARY SLOPE DRAIN

NO SCALE

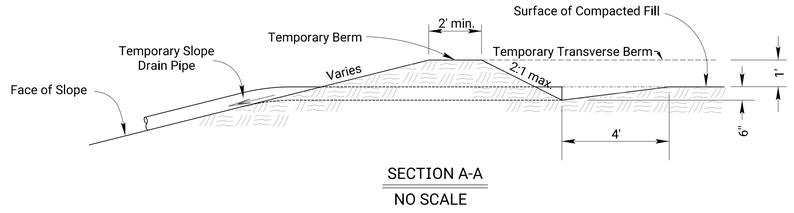
NOTES:

1) Temporary Slope Drain and Temporary Berm may be used on either project foreslopes or project backslopes.

2) Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.

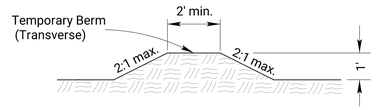
3) Pipe shall be secured in place as approved by Engineer.

4) Temporary Berms under 2,000 feet shall be bid by Set Price.



SECTION A-A

NO SCALE

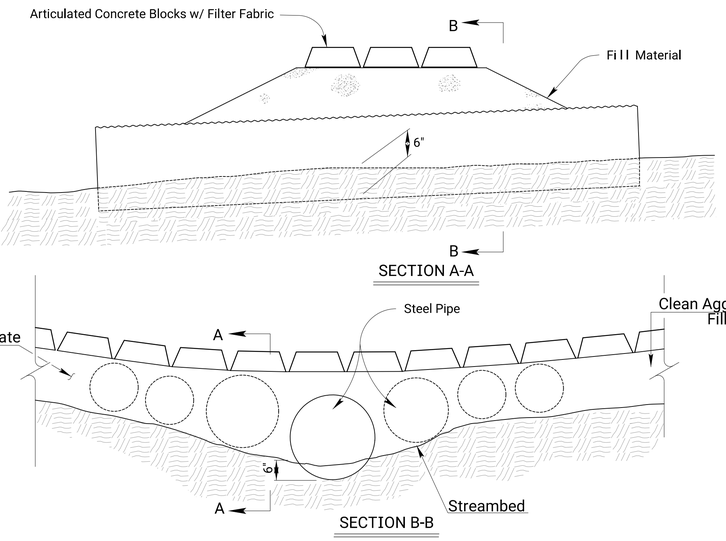


SECTION B-B

NO SCALE

TYPICAL PROFILE OF TEMPORARY BERM

NO SCALE



Pipe size may vary.

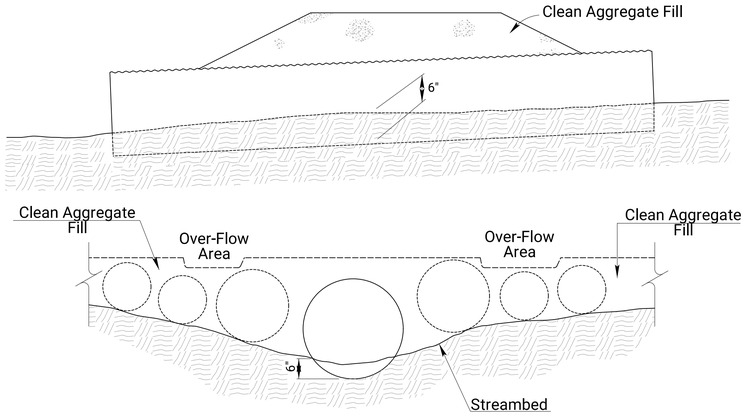
Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

TEMPORARY STREAM CROSSING (ARTICULATED CONCRETE BLOCKS)

NO SCALE



SECTION B-B

TEMPORARY STREAM CROSSING (AGGREGATE)

NO SCALE

Pipe size may vary.

Place 1 pipe buried 6" into stream bottom, in the lowest point of the channel to allow the passage of aquatic organisms, with additional pipes placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing.

Clean aggregate fill will extend a minimum of 50' on the entrance and exit side of the crossing to prevent tracking. The aggregate shall be clean aggregate and a minimum of 6" thick and will be maintained through the use of the crossing.

See KDOT Specifications for more information.

NO.	DATE	REVISIONS	BY	APP'D
03	01-21-22	Temp Stream Crossing - Clean Aggregate Fill Note Added	M.R.D.	M.L.
02	08-24-21	Temp Stream Crossing - Clean Aggregate Fill Note Added	M.R.D.	M.L.
01	06-11-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL
TEMPORARY SLOPE DRAIN, TEMPORARY STREAM CROSSING (AGGREGATE)

LA852B

FHWA APPROVAL	01-21-22	APP'D.	Mervin Lare
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

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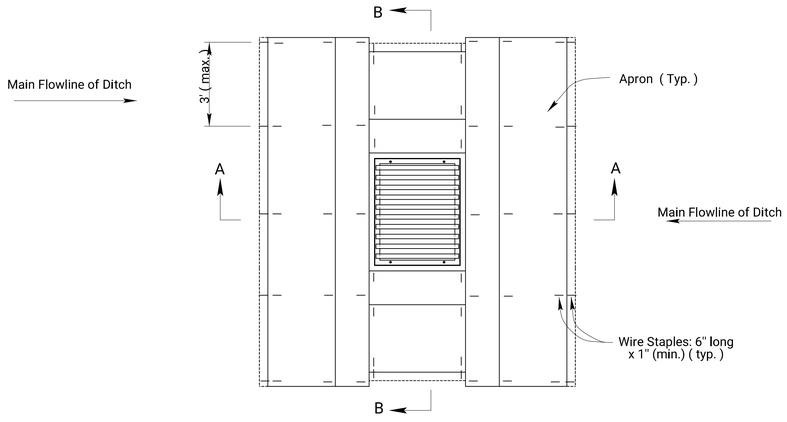
Drawn By : CAM
File : Erosion Stds 2.dgn

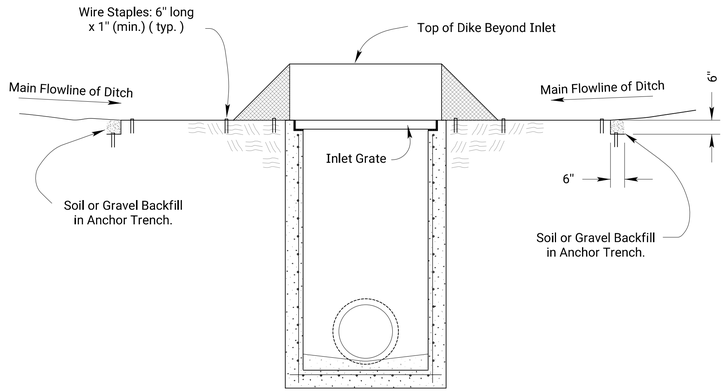
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	26	45



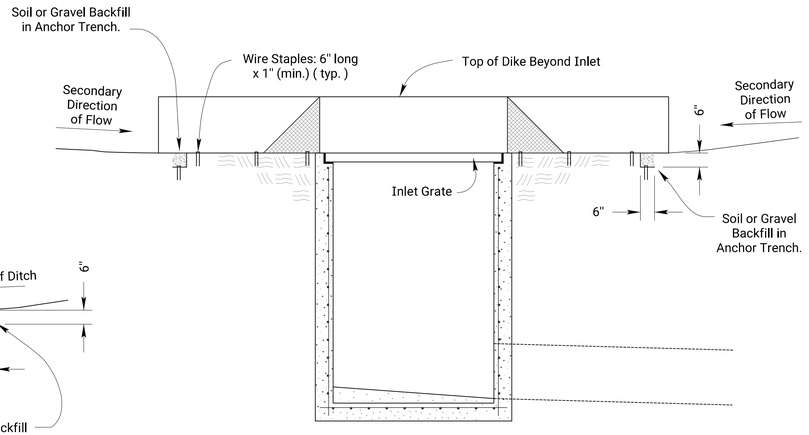
PLAN

TEMPORARY I NLET SEDI MENT BARRI ER
(TRI ANGULAR SI LT DI KE METHOD)

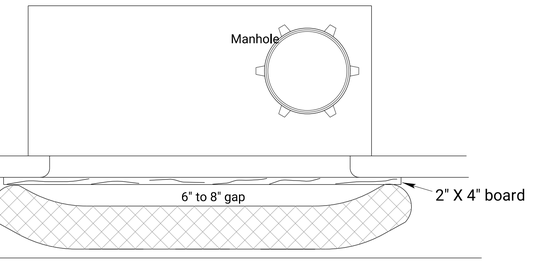
NO SCALE



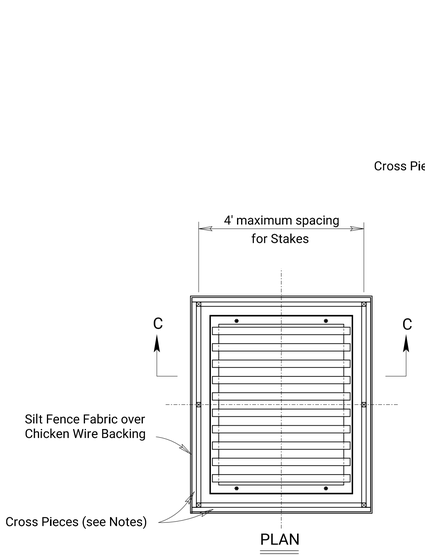
SECTION A - A



SECTION B - B



CURB INLET PROTECTION



PLAN

SECTION C - C

TEMPORARY I NLET SEDI MENT BARRI ER
(SI LT FENCE METHOD)

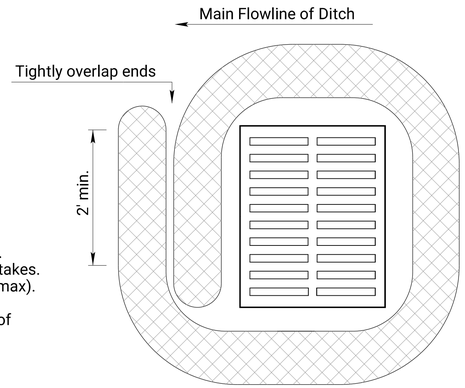
NO SCALE

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
   d. Synthetic - same strength as wood stakes.
2. Cross pieces shall be of same material as stakes.
3. Attach fence fabric securely on 6" centers (max).
4. Use of high flow material is acceptable.
5. Refer to plan sheets to estimate the length of silt fence required.

Bags = synthetic net (3mm mesh) or burlap bags

Rock = approximately 1" to 2" diameter



Drop inlet use
1'-6" TO 1'-8" diameter log

BIODEGRADABLE LOG/FILTER SOCK
DROP INLET PROTECTION

Note: 25% of log shall be keyed into ground during installation.

Stake every 4'

1. If multiple gravel bags are required, place them in such a way that no gaps are evident.
2. Height of bags (8" minimum diameter) must not be above top of curb.
3. Alternative products may be used other than gravel bags such as the "Gutter Buddy". Products must be approved by the Engineer.
4. Curb inlet protection will be measured and paid for as Filter Sock.

Material Requirements
Use 100% shredded mulch or other non-compost biodegradable material as fill for logs.
No compost or fines.
No hay or straw.
Do not use material which prohibits water infiltration.
Log Mesh: Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

NO.	DATE	REVISIONS	BY	APP'D
03	09-26-19	Changed Direction of Main Flowline of Ditch Arrow	M.R.D.	S.H.S.
02	03-10-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL, TEMPORARY INLET SEDIMENT BARRIER (SILT FENCE) TEMP. INLET SEDIMENT BARRIER (T.S.D.)

LA852C

FHWA APPROVAL		03-10-15	APP'D.		Scott H. Shields
DESIGNED	R.A.	DETAILED	R.A.	QUANTITIES	TRACED
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.	TRACE CK.

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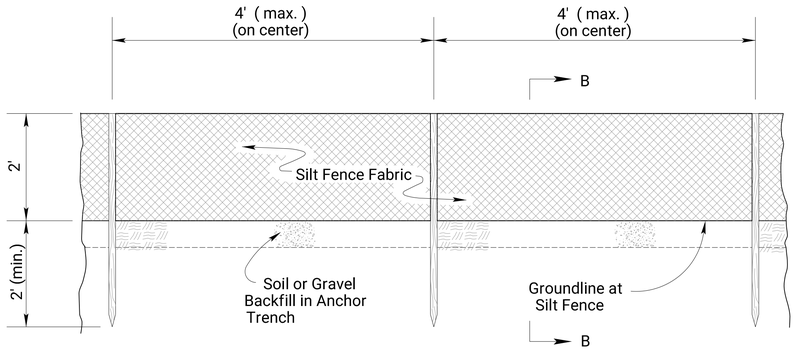
File : Erosion Stds 2.dgn

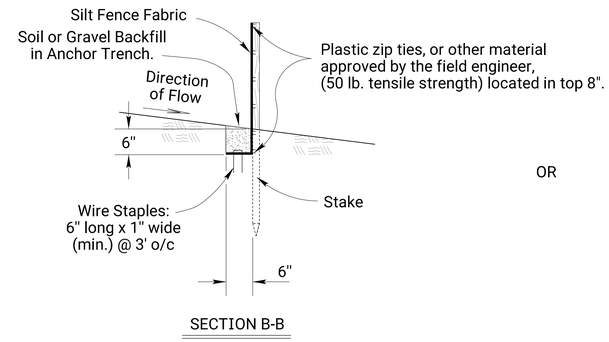
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	27	45



TYPICAL ELEVATION

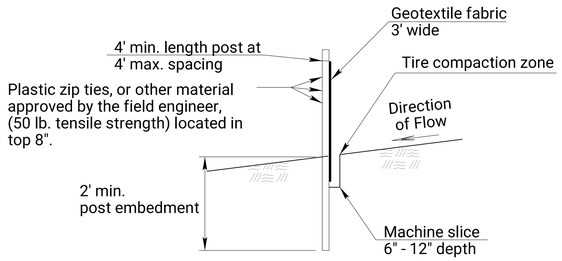
SILT FENCE BARRIER

NO SCALE



SECTION B-B

OR



SECTION B-B

INSTALLATION NOTES

SILT FENCE:

1. Stakes shall be 4' (min.) long and of one of the following materials:
   a. Hardwood - 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) - 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section - .95 lbs. per 1'-0"; or
   d. Synthetic - same strength as wood stakes.
2. Attach fence fabric with 3 zip ties within the top 8" of the fence
   Alternate attachment methods may be approved by the Engineer on a performance basis.
3. Use of high flow material is acceptable.
4. Refer to plan sheets to estimate the length of silt fence required.

BIODEGRADABLE LOG OR FILTER SOCK

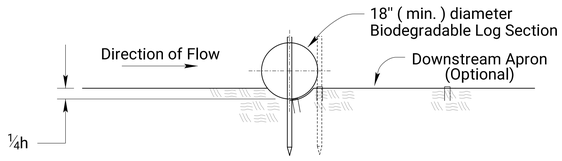
1. Place biodegradable logs or filter sock tightly together minimum overlap of 18".
2. Wood stakes shall be 2" x 2" (nom.).
3. Refer to plan sheets to estimate length of biodegradable log and filter sock required.
4. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.
5. Length of stakes should be 2 times the height of the log at a minimum with minimum ground embedment equal to the height of the log / sock.

Biodegradable Log or Filter Sock Slope Interruptions

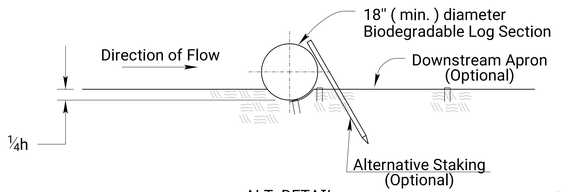
Slope Gradient	PRODUCT: 9" Sediment Log or 8" Filter Sock (ft)	12" Sediment Log or 12" Filter Sock (ft)	20" Sediment Log or 18" Filter Sock (ft)
≤4H:1V	40	60	80
3H:1V	30	45	60

Deviations should be approved by the Field Engineer.

BIODEGRADABLE LOG MATERIAL		
	LOW FLOW	HIGH FLOW
9"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
12"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber
18"-20"	Straw/Compost	Excelsior / Wood Chips / Coconut Fiber

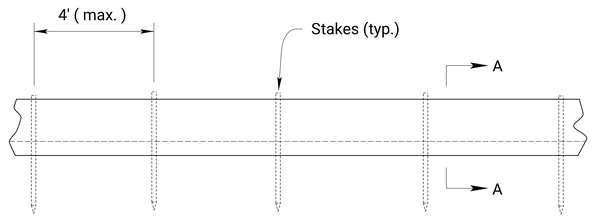


SECTION A - A



ALT. DETAIL

OPTIONAL



TYPICAL ELEVATION

BIODEGRADABLE LOG SLOPE INTERRUPTIONS

OR Filter Sock

GENERAL NOTES

1) Slope interruptions shall be placed along contour lines, with a short section turned upgrade at each end of the barrier.
2) The maximum length of the slope interruptions shall not exceed 250 feet, and the barrier ends need to be staggered.
3) Interruptions damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired immediately by Contractor at no additional cost to KDOT.
4) Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

NO.	DATE	REVISIONS	BY	APP'D
03	06-28-16	Revised Standard	R.A.	S.H.S.
02	03-01-15	Revised Standard	R.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL SLOPE INTERRUPTIONS BIODEGRADABLE LOG / SILT FENCE

LA852D

FHWA APPROVAL		09-14-16	APP'D.	Scott H. Shields	
DESIGNED	S.H.S.	DETAILED R.A.	QUANTITIES	TRACED	
DESIGN CK.	S.H.S.	DETAIL CK.	QUAN.CK.	TRACE CK.	

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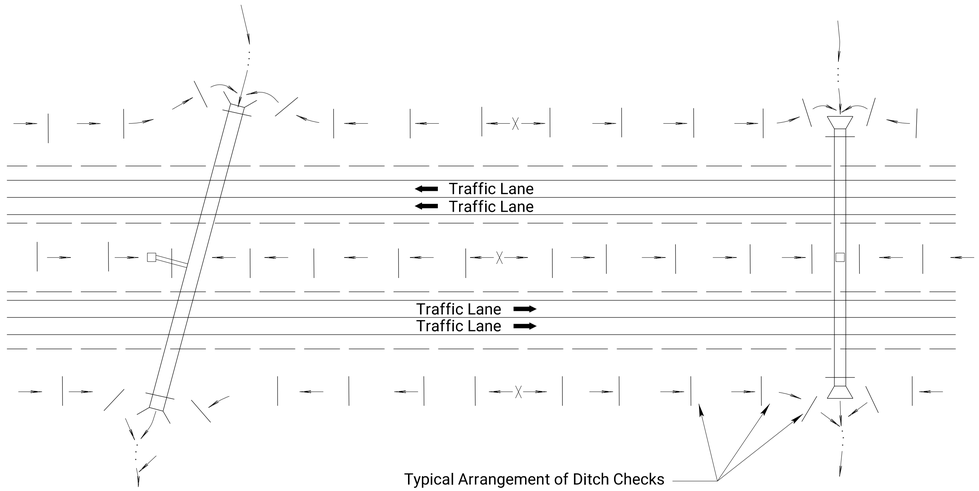
File : Erosion Stds 2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	28	45



TYPICAL DITCH CHECK LAYOUT PLAN

NO SCALE

20" BIOLOG CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	125
2.0	60
3.0	40
4.0	30
5.0	25
NOTE: Use this spacing for all except Rock Ditch Checks.	

18" FILTER SOCK CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
1.0	110
2.0	55
3.0	35
4.0	25
5.0	20
NOTE: Use this spacing for all except Rock Ditch Checks.	

GENERAL NOTES

1) The choice of ditch check methods is at the option of the Contractor.

2) Use only rock checks in situations where the ditch slope is 6 percent or greater.

2) Ditch checks damaged by Contractor's negligence, including improper maintenance or lack of maintenance, shall be repaired by Contractor at no extra cost to KDOT.

NO.	DATE	REVISIONS	BY	APP'D
03	08-10-16	Revised Standard	R.A.A.	S.H.S.
02	06-28-16	Revised Standard	R.A.A.	S.H.S.
01	06-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL DITCH CHECKS

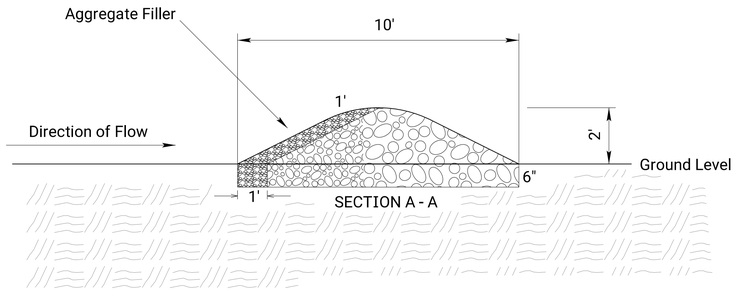
LA852E

FHWA APPROVAL			09-14-16	APP'D.		Scott H. Shields	
DESIGNED	S.H.S.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	S.H.S.

Plotted : 8/4/2023 4:33:11 PM

Drawn By : CAM
File : Erosion Stds 2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	29	45



TYPICAL ELEVATION

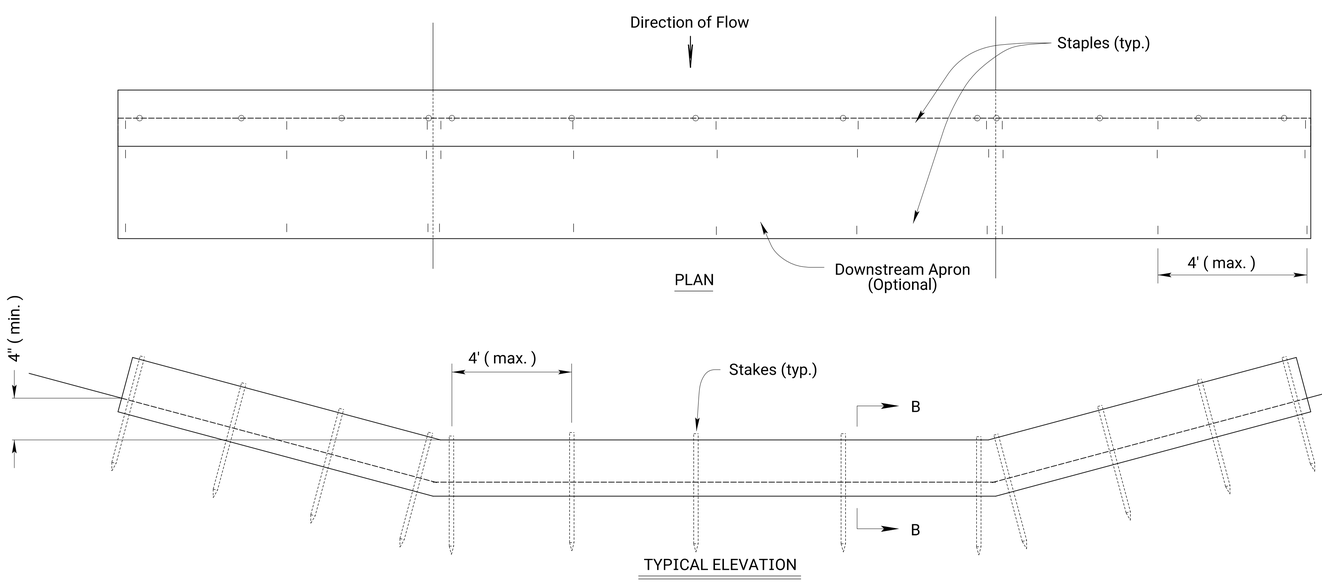
ROCK DITCH CHECK

NO SCALE

TEMPORARY ROCK DITCH CHECK SPACING	
DITCH ℄ SLOPE (%)	SPACING INTERVAL (FEET)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
NOTE: Use this spacing for Rock Ditch Checks only.	

ROCK DITCH CHECK NOTES

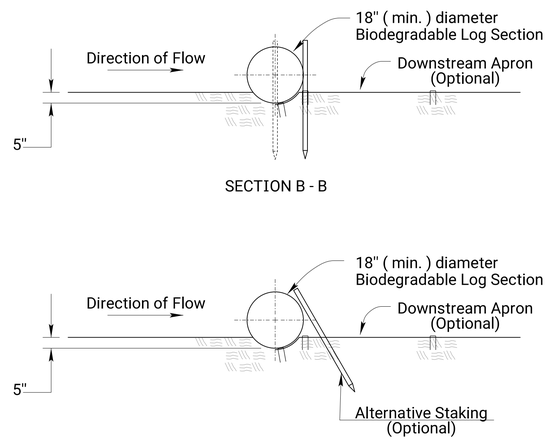
1. Rock shall be clean aggregate, D50-6" and aggregate filler.
2. Place rock in such manner that water will flow over, not around ditch check.
3. Do not use rock ditch checks in clear zone.
4. Excavation: The ditch area shall be reshaped to fill any eroded areas. Prior to placement of the rock, the ditch shall be excavated to the dimensions of the Rock Ditch Check and to a minimum depth of 6" (150mm). After placement of the rock, backfill and compact any over-excavated soil to ditch grade. This work shall be subsidiary to the bid item Temporary Ditch Check (Rock).
5. Aggregate excavated on site may be used as an alternate to the 6" rock, if approved by the Engineer.
6. The Engineer may approve the use of larger aggregates for the downstream portion of the check when conditions warrant their use.
7. When the use of larger rock is approved, D50-6" rock will be placed between the larger aggregate and the aggregate filler.
8. Aggregate filler will be placed on the upstream face of the ditch check. Aggregate filler will comply with Filter Course Type I, Division 1114.



BIODEGRADABLE LOG DITCH CHECK

OR Filter Sock Ditch Check

NO SCALE



BIODEGRADABLE LOG DITCH CHECK NOTES

1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 18".
3. Stakes shall be wood or steel according to Section 2114 of the Standard Specifications. Length of stakes shall be a minimum of 2 x the diameter of the log.
4. Use Erosion Control (Class 1) (Type C) as the downstream apron when required.
5. A downstream apron is required when directed by the Engineer. Apron material will be paid at the contract unit price.
6. Each log or sock (except compost filter socks) should be keyed into the ground at a minimum of 25% of its height. Compost filter socks should be placed on smooth prepared ground with no gaps between the sock and soil.

NO.	DATE	REVISIONS	BY	APP'D
03	11-19-20	Revised Standard	M.R.D.	M.L.
02	08-10-16	Revised Standard	R.A.A.	S.H.S.
01	10-21-15	Revised Standard	R.A.A.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION AND POLLUTION CONTROL ROCK DITCH CHECKS BIODEGRADABLE LOG DITCH CHECKS

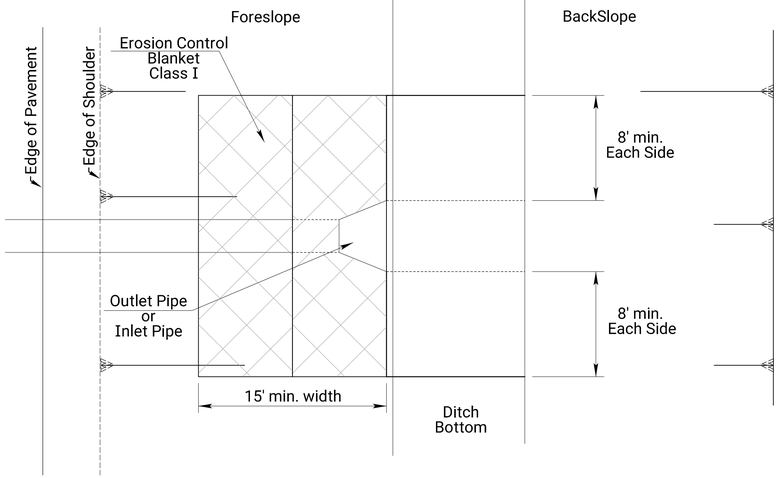
LA852G

FHWA APPROVAL			11-19-20	APP'D.		Mervin Lare	
DESIGNED	M.L.	DETAILED	D.K.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	M.L.	DETAIL CK.	M.L.	QUAN.CK.		TRACE CK.	R.A.A.

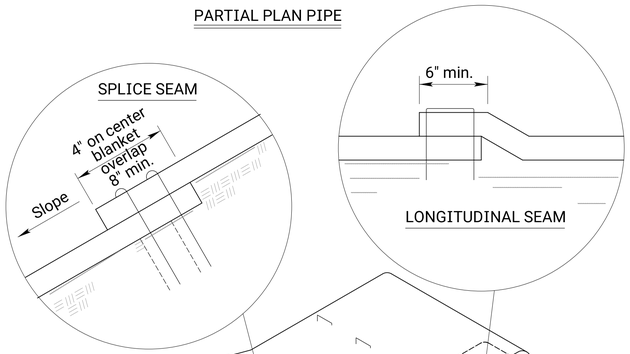
Plotted : 8/4/2023 4:33:11 PM

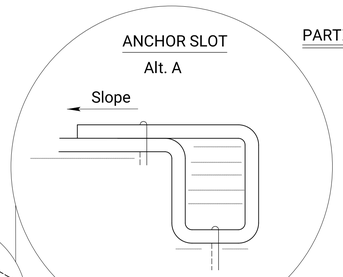
Drawn By : CAM
File : Erosion Stds 2.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	30	45



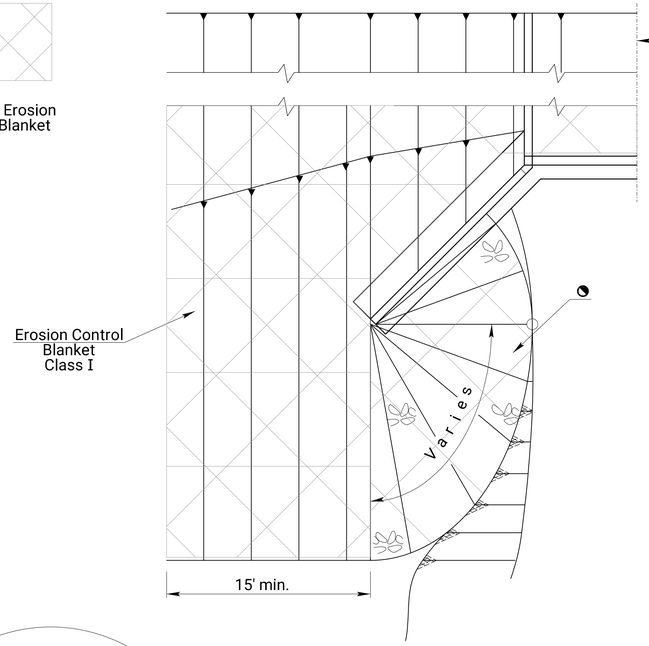
PARTIAL PLAN PIPE





ISOMETRIC VIEW

Limits of Erosion Control Blanket



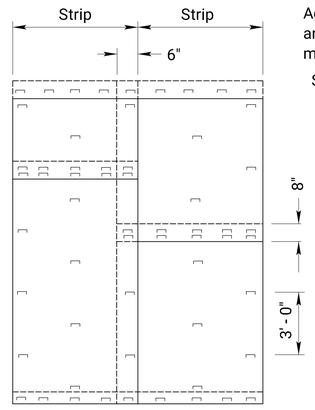
PARTIAL PLAN BOX CULVERT

◔ Erosion Control Class I may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans).

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 1

Erosion Control Blankets shall be laid loosely in the direction of the slope, beginning at the bottom of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

1. ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.
2. LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.
3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger splice seams.
4. TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.
5. TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.
6. STAPLE CHECK: ‡Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.



PLAN VIEW - ANCHORING DIAGRAM

NOTE:
Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Single post ring and shank staple is acceptable.

NO.	DATE	REVISIONS	BY	APP'D
04	03-01-15	Revised Standard	R.A.A.	S.H.S.
03	02-23-15	Revised Standard	R.A.A.	S.H.S.
02	09-15-14	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

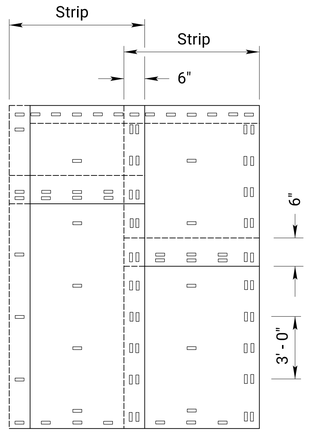
INSTALLATION DETAIL EROSION CONTROL CLASS 1 SLOPE PROTECTION

LA855

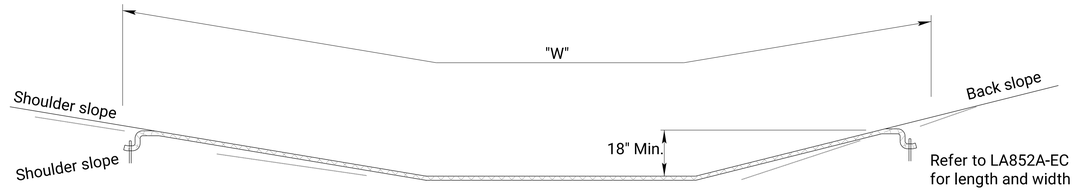
FHWA APPROVAL			03-10-15	APP'D.		Scott H. Shields	
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.		DETAIL CK.		QUAN.CK.		TRACE CK.	R.A.A.

Plotted : 8/4/2023 4:33:12 PM
Drawn By : CAM
File : Erosion Stds 2.dgn

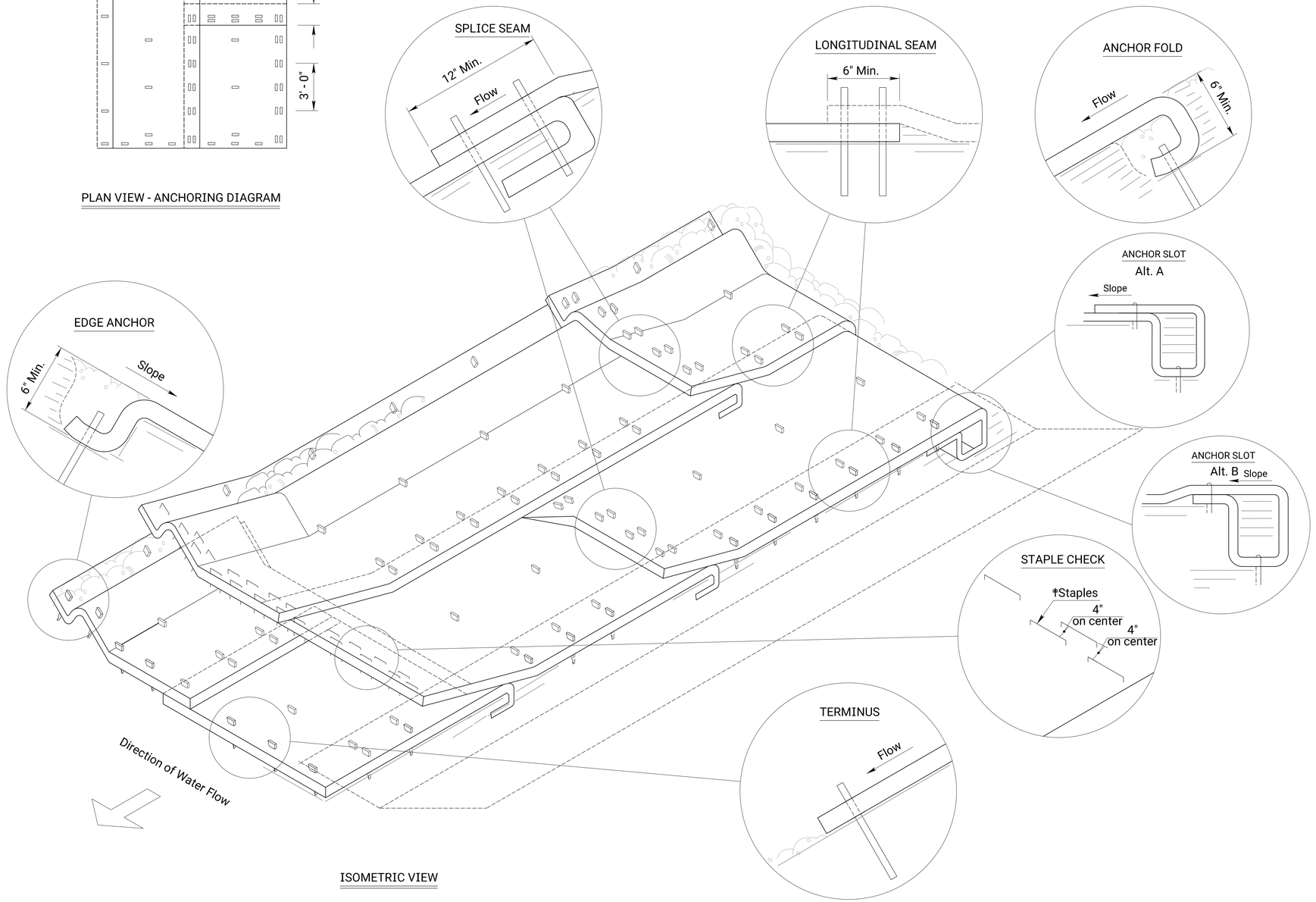
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	31	45



PLAN VIEW - ANCHORING DIAGRAM



CROSS SECTION (Ditch Lining)



ISOMETRIC VIEW

INSTALLATION DETAILS FOR EROSION CONTROL CLASS 2

Erosion Control Mats shall be laid loosely in the direction of the flow, with the first course at the centerline of channel, where applicable. In order for the mat to be in contact with the soil, lay the mat loosely, avoiding stretching.

1. ANCHOR FOLD: The top of the mat should be folded under, buried and secured with approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot, 6 inches wide x 6 inches deep; anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.

2. LONGITUDINAL SEAMS: The adjacent edges of the mat should overlap a minimum of 6 inches, with anchors catching the edges of both mats.

3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 12 inches in direction of water flow. Stagger splice seams.

4. STAPLE CHECK: ‡Establish Staples in 2 rows 4" on center apart. Staple Checks - shall be 30' apart.

5. EDGE ANCHOR: Lay outside edge of mat into trench at top of side slope. Anchor at 3 foot intervals along trench.

6. TERMINUS: The bottom edge of the mat shall be anchored in place with anchors spaced at 9 inch intervals along the terminating edge.

7. TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.

NO.	DATE	REVISIONS	BY	APP'D
04	09-25-15	Modified Staple Check	R.A.A.	S.H.S.
03	09-15-14	Revised Standard	R.A.A.	S.H.S.
02	03-01-13	Revised Standard	M.R.M.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

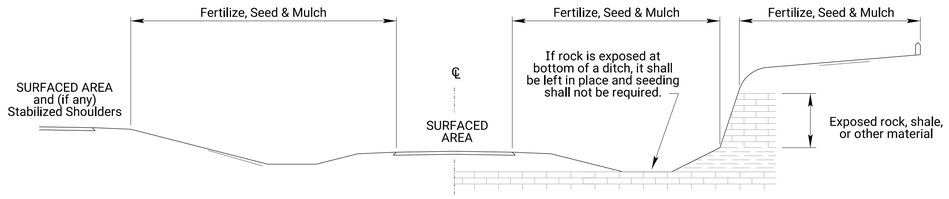
INSTALLATION DETAIL
EROSION CONTROL CLASS 2
FLEXIBLE CHANNEL LINER

LA856

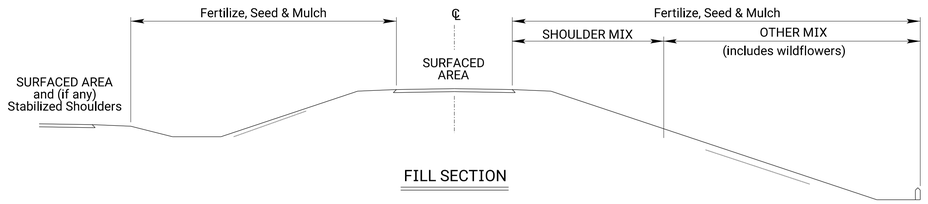
FHWA APPROVAL			11-02-15	APP'D.		Scott H. Shields	
DESIGNED	R.A.A.	DETAILED	R.A.A.	QUANTITIES		TRACED	R.A.A.
DESIGN CK.	S.H.S.	DETAIL CK.	S.H.S.	QUAN.CK.		TRACE CK.	

Plotted : 8/4/2023 4:33:12 PM
Drawn By : CAM
File : Erosion Stds 2.dgn

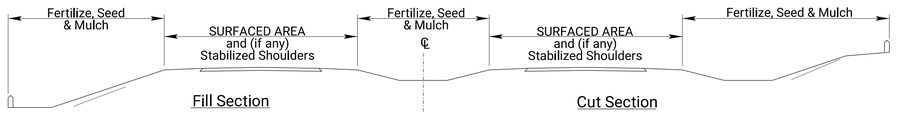
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	32	45



CUT SECTION



FILL SECTION



TYPICAL SECTION - DUAL PAVEMENT

GRASS & WILDFLOWER SEEDING SEASONS

COOL SEASON GRASSES	WARM SEASON GRASSES & WILDFLOWERS
February 15 thru April 20 August 15 thru September 30	November 15 thru June 1
SPECIES	SPECIES
Bluegrasses	Bermuda Grass
Brome Grasses	Big Bluestem
Canada Wildrye	Blue Grama
Fescues	Buffalo Grass
Prairie Junegrass	Indiangrass
Ryegrasses	Little Bluestem
Sterile Wheatgrass	Sand Bluestem
Tall Dropseed	Sand Dropseed
Western Wheatgrass	Sand Lovegrass
	Side Oats Grama
	Switchgrass
	Wildflower Mixes

When the area to be seeded is 1 acre or more, if Cool Season grasses are mixed with Warm Season grasses, seed the area during the Warm Season.

When the area to be seeded is less than 1 acre, seed the area any time of the year.

SODDING SEASONS

COOL SEASON GRASSES	WARM SEASON GRASSES
March 1 thru April 15 September 1 thru November 15	May 15 thru September 1
SPECIES	SPECIES
Bluegrass Sod	Buffalo Grass Sod
Fescue Sod	

If the soil is workable, the Engineer may allow placement of sod between November 15 and March 1. If sod is placed during this time, maintain the sod until 20 days after the beginning of the spring sodding season.

GENERAL NOTES

The entire disturbed area, excepting the paved or surfaced areas, steep rocky slopes and areas of undisturbed native sod or other desirable vegetation shall be fertilized (limed when required), seeded and mulched. Soil preparation shall conform to the Standard Specifications except as noted below.

All borrow areas shown on the plans are to be fertilized, seeded, and mulched. However, operation in borrow areas where crops are growing may be omitted when requested by the owner.

If temporary cover has provided stable slopes with no erosion, seed the permanent grasses into the existing cover. If there has been erosion that requires repair prior to seeding, then it may be necessary to regrade the area, resulting in bare ground.

FERTILIZER: A ratio and application rate that equals or exceeds the required minimum rate per acre of N, P_2O_5 , K_2O listed in Summary of Seeding Quantities will be acceptable.

MULCHING: Mulch shall be spread uniformly over all disturbed areas and punched in the soil, unless otherwise noted on the plans. The rate of application per acre, thickness in place, for the mulching material is generally as follows:

$1\frac{3}{4}$ - $2\frac{1}{4}$ Tons per Acre = $1\frac{1}{2}$" loose depth spread uniformly over acre.

Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

Other vegetative mulches are acceptable only with the Engineer's concurrence.

The above rate is a guide. It will be at the discretion of the Engineer to determine what rate is sufficient for adequate protection of newly seeded areas.

NATIVE WILDFLOWER MIX 1

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	
0.3	Common Milkweed	
0.3	Black Eyed Susan	
0.5	Blanket Flower	
0.5	False Sunflower	
0.5	Lance-Leaf Coreopsis	
0.2	Maximilian Sunflower	
0.1	New England Aster	
0.2	Pinnate Prairie Coneflower	
0.2	Plains Coreopsis	
0.3	Purple Coneflower	
0.3	Upright Prairie Coneflower	
0.3	Dames Rocket	
0.3	Lemon Mint	
0.2	Pitcher Sage	
0.2	Wild Bergamot	
1.0	Illinois Bundleflower	
0.2	Common Evening Primrose	
0.1	Hoary Verbena	
0.8	Purple Prairie Clover	
0.3	Roundhead Lespedeza	
3.0	Showy Partridge Pea	
0.2	White Prairie Clover	
10.3	Total (lb)	

NATIVE WILDFLOWER MIX 2

PLS RATE	NAME	QTY (lb)
0.3	Butterfly Milkweed	
0.3	Black Eyed Susan	
0.5	Black Sampson Coneflower	
1.0	Blanket Flower	
0.2	Maximilian Sunflower	
0.2	Plains Coreopsis	
0.2	Upright Prairie Coneflower	
0.2	Western Yarrow	
0.3	Lemon Mint	
0.4	Pitcher Sage	
1.5	Illinois Bundleflower	
0.2	Common Evening Primrose	
1.0	Blue Wild Indigo	
0.4	Leadplant	
0.4	Purple Prairie Clover	
0.3	White Prairie Clover	
7.4	Total (lb)	

Package and deliver the wildflower seed separately from the grass seed mix. Package and deliver the Tall Drop Seed separately from the grass seed and the wildflower mix. Place the grass seed (except Tall Drop Seed) in the large seed box and drill (cover) seed $\frac{1}{8}$" -$\frac{1}{4}$". Place the wildflower seed in a separate seed box and drill (cover) seed $\frac{1}{16}$" maximum. Place the Tall Drop Seed in a separate (third) seed box and place the seed (using the seed drill) on the soil surface.

OPTION: Broadcast Tall Drop Seed on the soil surface.

SUMMARY OF SEEDING QUANTITIES

P.L.S. RATE/ACRE SHLDR	P.L.S. RATE/ACRE OTHER	ACRES SHLDR	ACRES OTHER	BID ITEM	QUANTITY	UNIT
	200	1.01		Fertilizer(15-30-15)		
	348	1.01		Seed (Fescue)(Tall)(Endophyte-Free)		
				Seeding, Fertilizing & Mulching	1.01	ACRE
				Mulching *		

SHLDR = Seeded with the Shoulder Mix. Typically 15 feet for 2-lane roads and 30 feet for 4-lane roads. Includes outside roadsides, turfed portions of shoulders, and turfed portion of the median.

OTHER = Seeded with the "Other" Mix. Designated as all other turf areas, except the Shoulder. Usually includes a Native Wildflower Mix.

NOTE: Projects less than 1 acre shall be bid as "Seeding" by the lump sum. All disturbed areas shall be seeded, fertilized and mulched at the listed rate per acre. The acres are estimated.

Refer to the Standard Specifications, Division 900, Section 904 'Seeding', and Section 907 'Sodding', for the seeding and sodding seasons.

* See LA852A for mulching quantity. The quantity of mulch is estimated (Acres of Seeding X 1.5 X 2 Tons/Acre). The total mulch required shall be determined in the field. The bid item for mulching shall be paid for according to the Standard Specifications.

NO.	DATE	REVISIONS	BY	APP'D
02	11-25-20	Updated Seeding / Sodding Periods Charts	M.R.D.	M.L.
01	08-03-20	Revised Standard	M.R.D.	S.H.S.

KANSAS DEPARTMENT OF TRANSPORTATION

PERMANENT SEEDING SUMMARY OF SEEDING QUANTITIES

LA850

FHWA APPROVAL	05-06-19	APP'D.	Mervin Lare
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Plotted : 8/4/2023 4:33:12 PM

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File : Erosion Stds 2.dgn

1) Design Speed: Those items delegated to temporary traffic control should be designed and installed using the posted/legal speed of the roadway prior to work starting.

2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

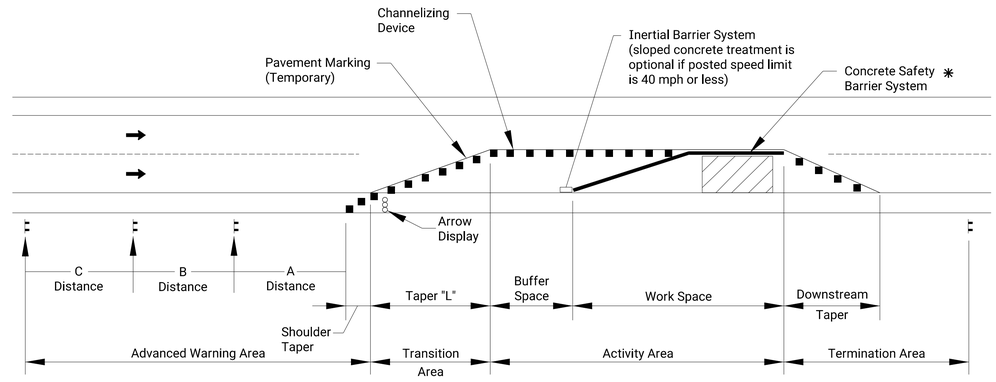
3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-1210 45.00	2023	33	45



TYPICAL WORK ZONE COMPONENTS

✳ When concrete barrier system is used, portable channelizing devices are not needed along the tangent barrier section.

Minimum advance warning sign spacing (in feet):

SPEED (MPH) ✳	*A*	*B*	*C*
URBAN (40 MPH OR LOWER)	*100*	*100*	*100*
URBAN (45 MPH OR HIGHER)	*350*	*350*	*350*
RURAL (55 MPH OR LOWER)	*500*	*500*	*500*
RURAL (60 MPH OR HIGHER)	*750*	*750*	*750*
EXPRESSWAY/FREEWAY	*1000*	*1500*	*2640*

✳ Posted speed prior to work starting

The minimum spacing between signs shall be no less than 100', unless directed by the engineer.

The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Taper Formulas:

L = WS for speeds of 45 MPH or more

L = $WS^2/60$ for speeds of 40 MPH or less

Where: L = Minimum length of taper in feet
S = Numericial value of posted speed prior to work starting in MPH
W = Width in offset feet

Shifting Taper=1/2 L
Shoulder Taper=1/3 L

Channelizer Placement:

(1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

(2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

(3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

(4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

(5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Buffer Space

SPEED (MPH) ✳	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*	*60*	*65*	*70*	*75*
LENGTH (ft)	*115*	*155*	*200*	*250*	*305*	*360*	*425*	*495*	*570*	*645*	*730*	*820*

✳ Posted speed prior to work starting

Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

If temporary concrete safety barrier system is used to separate approaching traffic from the work space, the barrier system shall be considered part of the activity area. A full lane width should be available throughout the length of the buffer space. See typical work zone components above.

NO.	DATE	REVISIONS	BY	APP'D
02	03-13-18	W8-15p usage changed to Shall	R.W.B.	E.K.G.
01	08-18-15	Channelizer spacing info	R.W.B.	K.E.

KANSAS DEPARTMENT OF TRANSPORTATION

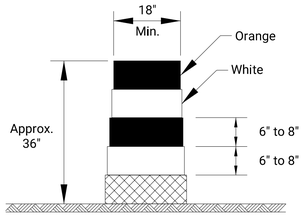
TRAFFIC CONTROL GENERAL NOTES

TE700

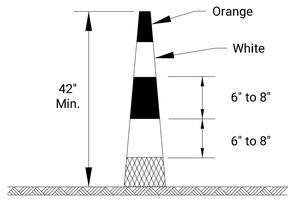
FHWA APPROVAL		03-13-18	APP'D.		Eric Kocher
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

Plotted : 8/4/2023 4:33:16 PM
Drawn By : CAM
File : TrafficControl.dgn

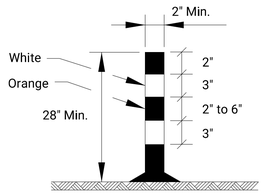
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	34	45



DRUM

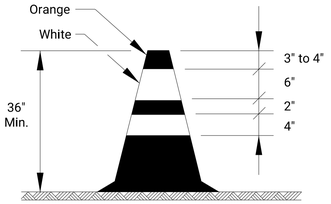


CONICAL
DELINEATOR

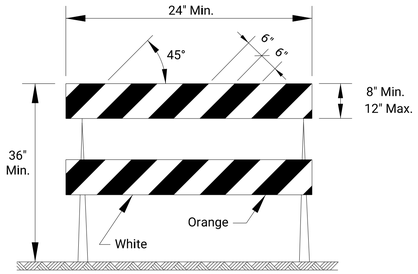


TUBULAR MARKER

Striping as shown for up to 42".

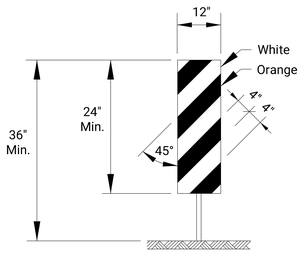


TRAFFIC CONE



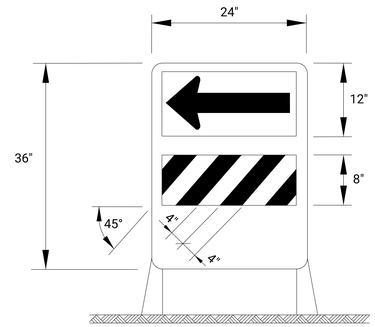
TYPE 2 BARRICADE

For rails less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.



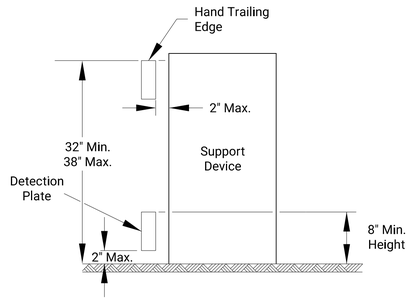
VERTICAL PANEL

The stripes shall slope downward to the traffic side for channelization.



DIRECTION INDICATOR BARRICADE

The stripes shall slope downward in the direction traffic is to pass. The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.



PEDESTRIAN CHANNELIZER

1. Support device shall not project beyond the detection plate into the pathway.
2. Hand trailing edges and detection plates are optional for continuous walls.
3. Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
4. Alternate pathways shall be firm, stable, and slip resistant.
5. Treat height differentials > 1/2" in the surfaces of alternate paths with a firm, stable, and slip resistant temporary ramp having a slope of 12:1 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

Item	Location	Cross-overs	Shoofly Diversions	Tangents	Tapers	Ramps	Head to Head	Object Identifier	Lead-in Devices	Gores
Portable										
	Drums	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Conical Delineators	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(1,2)	Yes	(2)	(2)
	Direction Indicator Barricade	No	No	No	Yes	No	No	No	No	No
	Type 2 Barricade	(2)	(2)	(2)	(2)	No	No	Yes	No	No
	Traffic Cones	No	No	(4)	(4)	(4)	No	(4)	(4)	(4)
Fixed										
	Tubular Markers	(3)	(3)	(3)	No	(3)	Yes	No	Yes	Yes
	Vertical Panels	(3)	(3)	(3)	(3)	(3)	(3)	Yes	(2,3)	(2)

(1) Not allowed on centerline delineation along freeways or expressways.
(2) The stripes shall slope downward to the traffic side for channelization.
(3) May be used upon the approval of the engineer.
(4) Daytime operations only.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CHANNELIZING DEVICES

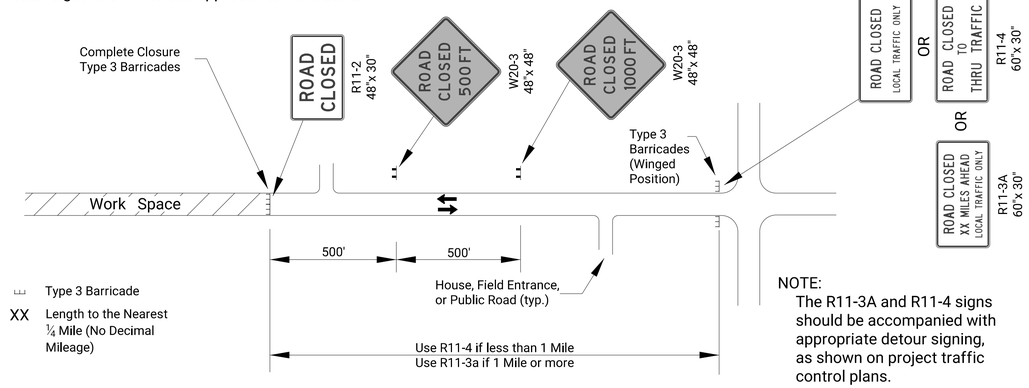
TE702

FHWA APPROVAL		06-01-15	APP'D.	Kristina Ericksen	
DESIGNED	L.E.R.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

Plotted : 8/4/2023 4:33:16 PM
Drawn By: CAM
File : TrafficControl.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	35	45

Note: Signs shown for one approach to work zone.



NOTE:
The R11-3A and R11-4 signs should be accompanied with appropriate detour signing, as shown on project traffic control plans.

FIGURE 1: TYPICAL SIGNING FOR ROAD CLOSURE (MAINLINE OR SIDE ROAD)

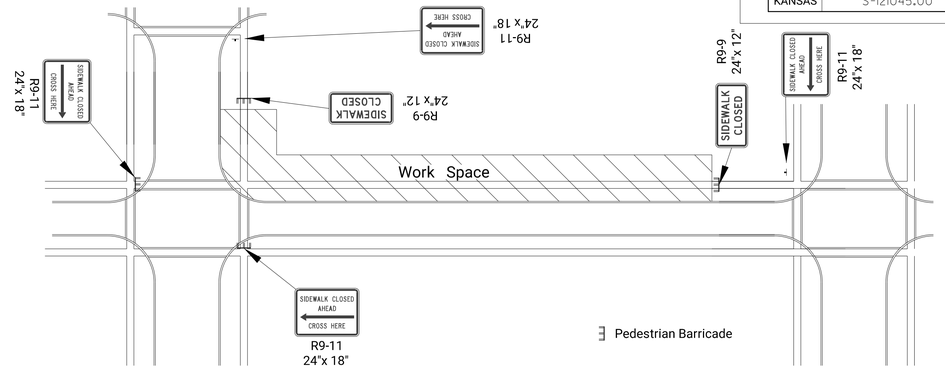


FIGURE 4: TYPICAL SIGNING FOR SIDEWALK CLOSED WITH OPPOSITE SIDEWALK AVAILABLE

Note: Sign shown for one approach to intersection (work zone).

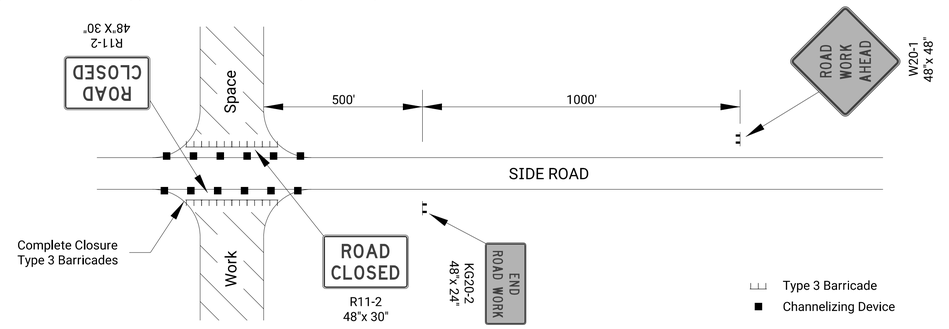


FIGURE 2: TYPICAL SIGNING FOR SIDE ROAD OPEN

Note: Signs shown for one approach to work zone.

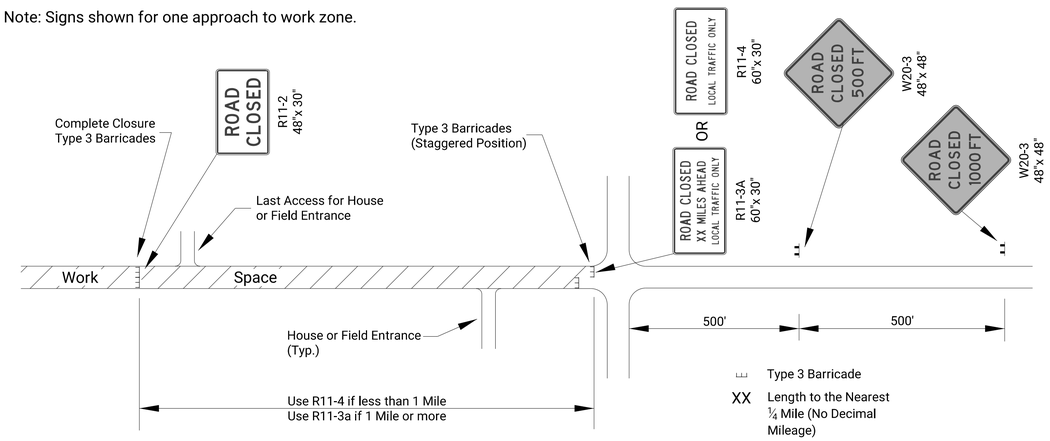
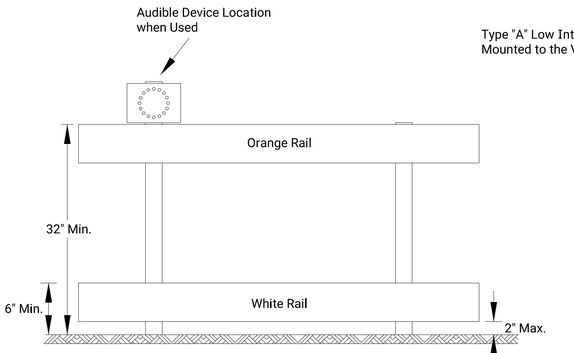
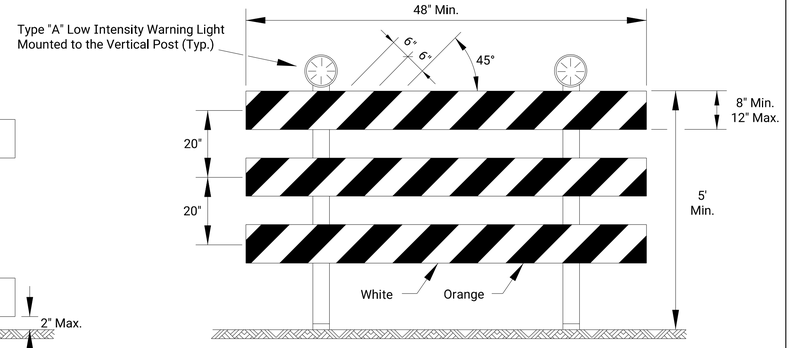


FIGURE 3: TYPICAL SIGNING FOR ROAD CLOSURE - LOCAL TRAFFIC ACCESS



DETECTABLE BARRICADE

1. Support device shall not project beyond the detection plate into the pathway.
2. Barricades shall be used to close the entire width of the pathway.
3. Do not use warning lights on pedestrian barricades.
4. Do not use warning lights on audible devices.



TYPE 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the three rails.

When barricades are placed end-to-end or staggered, a Type "A" low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

ROAD CLOSED GENERAL NOTES

As shown in Figure 1, at the point where thru traffic must detour and local traffic can proceed to the location where the roadway is completely closed, the R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) or R11-4 (ROAD CLOSED LOCAL TRAFFIC ONLY or ROAD CLOSED TO THRU TRAFFIC) sign shall be used with Type 3 barricades (winged position), placed on the shoulders of roadway.

As shown in Figure 3, when local traffic must be allowed access into the work zone, Type 3 barricades shall be longitudinally staggered to maintain the appearance of a closed roadway. A second line of end-to-end Type 3 barricades shall be placed just beyond the last access point in the work zone, to completely close the roadway.

The R11-4 (ROAD CLOSED TO THRU TRAFFIC or ROAD CLOSED LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is less than 1 mile.

The R11-3a (ROAD CLOSED # MILES AHEAD LOCAL TRAFFIC ONLY) sign shall be used when the distance to the point of complete closure of the roadway is 1 mile or greater.

The words "BRIDGE OUT" (or BRIDGE CLOSED) may be substituted for the words "ROAD CLOSED" on the R11-3a or R11-4 sign where applicable.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL CLOSURES

TE704

FHWA APPROVAL		06-01-15	APP'D.	Kristina Ericksen			
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES		TRACED	
DESIGN CK.		DETAIL CK.		QUAN.CK.		TRACE CK.	

Plotted : 8/4/2023 4:33:16 PM
Drawn By : CAM
File : TrafficControl.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	36	45

SIGN LAYOUT INFORMATION

KG20-2 — Std. Size Expwy/Freeway: 6" C, 48"x 24"

KG20-5 — Std. Size Expwy/Freeway: 6" C, 48"x 24"

KM4-20 — Std. Size: 3" C, 24"x 6" — Expwy/Freeway: 6" C, 48"x 12"

W7-3a — Mileage to be Determined by the Engineer.

W8-17 — Std. Size Expwy/Freeway: 48"x 48"

W8-15 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

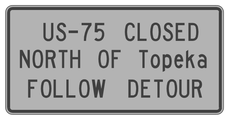
W8-7 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

W8-15p — Std. Size Expwy/Freeway: 30"x 24"

W8-11 — Std. Size Expwy/Freeway: 8" D, 48"x 48"

W8-17P (Optional) — Std. Size Expwy/Freeway: 30"x 24"

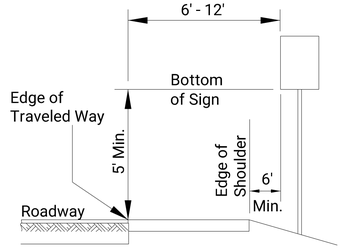
SP-01 (Special Sign) — Std. Size: 6" C — Expwy/Freeway: 10" D



SP-02 (Special Sign)

Std. Size		Expwy/Freeway	
Uppercase:	6" C	Uppercase:	10" D
Lowercase:	4.5" C	Lowercase:	8" D

All city names and street names on special signs and destination signs must have upper and lower case letters.

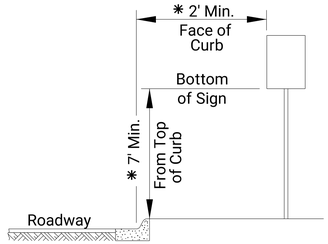


RURAL

1) Ground-mounted signs shall be mounted at a minimum height of 5' measured from the bottom of sign to the near edge of the pavement.

2) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

3) The height of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.



URBAN

1) Signs shall be mounted at a minimum height of 7' measured from the bottom of sign to the near edge of the pavement.

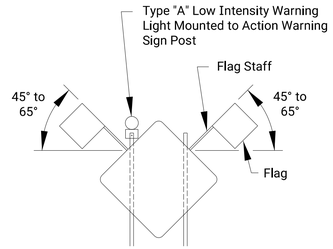
2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.

3) Signs mounted lower than 7' should not project more than 4" into pedestrian facilities.

4) The height from of the secondary sign mounted below another sign may be 6' measured from the bottom of sign to the near edge of the pavement. Signs shall not overlap each other.

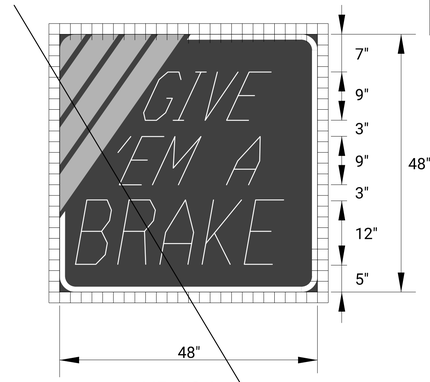
5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

* 6) Pedestrian detour signing shall be a minimum of 2' measured from the top of the pedestrian pathway to the bottom of the sign and shall not protrude into the walkway nor shall it project beyond the back of curb.



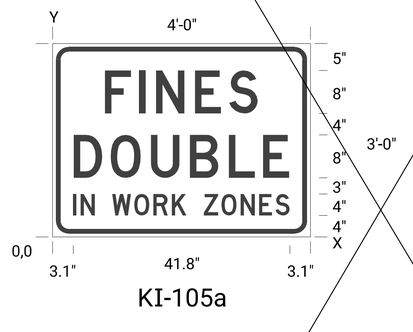
When the sign width is equal to or greater than 9', three or more wood posts may be used with a minimum of 4' between the centerline of each post. All signs less than 9' in width shall use a maximum of two wood posts.

In the case of hitting rock when driving posts
1. Shift the sign location. Do not violate minimum sign spacing.
2. With the engineer's approval, use acceptable alternative sign stands.



KI-104a

Sign Number	GIVE EM A BRAKE
Width x Height	4'-0" x 4'-0"
Border Width	1.0"
Corner Radius	4.0"
Stripe Width	3.0"
Mounting	Ground
Background	Type: Non-Reflective
	Color: Black
Legend/Border	Type: Reflective
	Color: White
Legend Font	Dutch 801 Roman SWC 25 Degree Slant
Stripes	Type: Reflective
	Color: Orange



KI-105a

Sign Number	FINES DOUBLE
Width x Height	4'-0" x 3'-0"
Border Width	0.9"
Corner Radius	3.0"
Mounting	Ground
Background	Type: Reflective
	Color: White
Legend/Border	Type: Non-Reflective
	Color: Black

Dimensions in inches — Spacings are to start of next letter

Y FONT	LETTER SPACINGS															HT LEN
23.0 D		F	I	N	E	S										8.0
	9.7	6.4	3.2	7.3	6.4	5.4	9.7									28.6
11.0 D		D	O	U	B	L	E									8.0
	3.9	6.9	7.5	7.3	7.3	6.4	4.9	3.9								40.3
4.0 D		I	N		W	O	R	K		Z	O	N	E	S		4.0
	3.1	1.6	2.7	3.2	4.3	3.8	3.6	2.8	3.2	3.4	3.8	3.6	3.2	2.7	3.1	41.8

Notes:

Typically, there are two sets of informational signs installed per project: one for each direction of traffic.

Install signs a minimum of 500' in advance of the road work ahead sign. The engineer may designate a more appropriate location if conditions dictate.

The informational signs are not to interfere with the traffic control signs for the project.

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGN INFORMATION

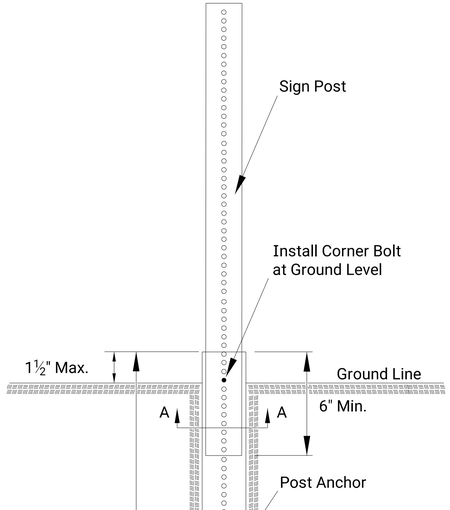
TE710

FHWA APPROVAL		06-01-15	APP'D.	Kristina Ericksen	
DESIGNED	R.W.B.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

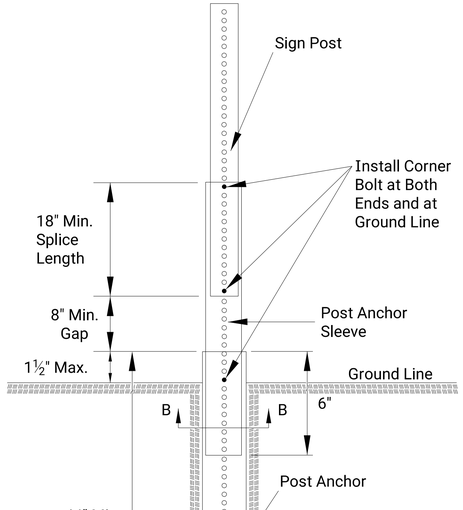
Plotted : 8/4/2023 4:33:17 PM
Drawn By : CAM
File : TrafficControl.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	37	45

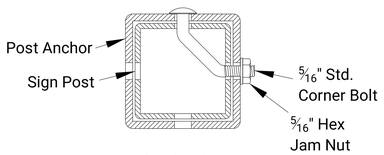
PERFORATED SQUARE STEEL TUBE (P.S.S.T.) POST SETUP



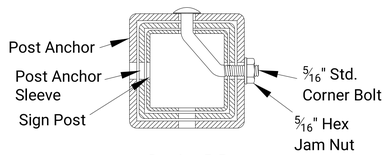
P.S.S.T. Detail



Telescoping P.S.S.T. Detail



Section A-A

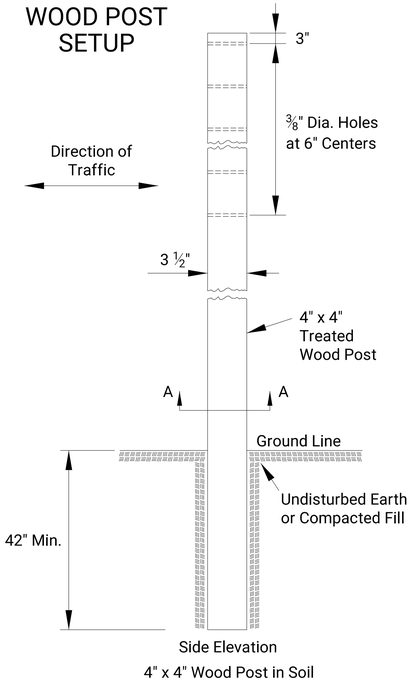


Section B-B

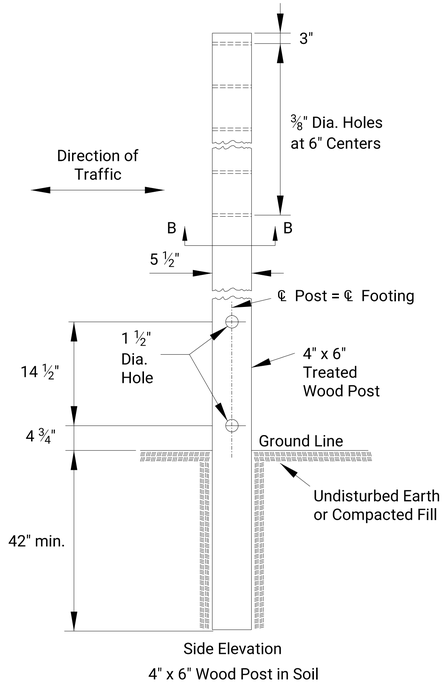
Details for 2", 2 ¼", or 2 ½" sign posts

Place bolts in the same corner along each sign post.

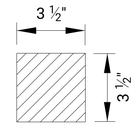
WOOD POST SETUP



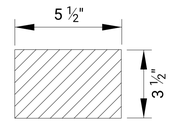
Side Elevation
4" x 4" Wood Post in Soil



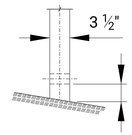
Side Elevation
4" x 6" Wood Post in Soil



Section A-A



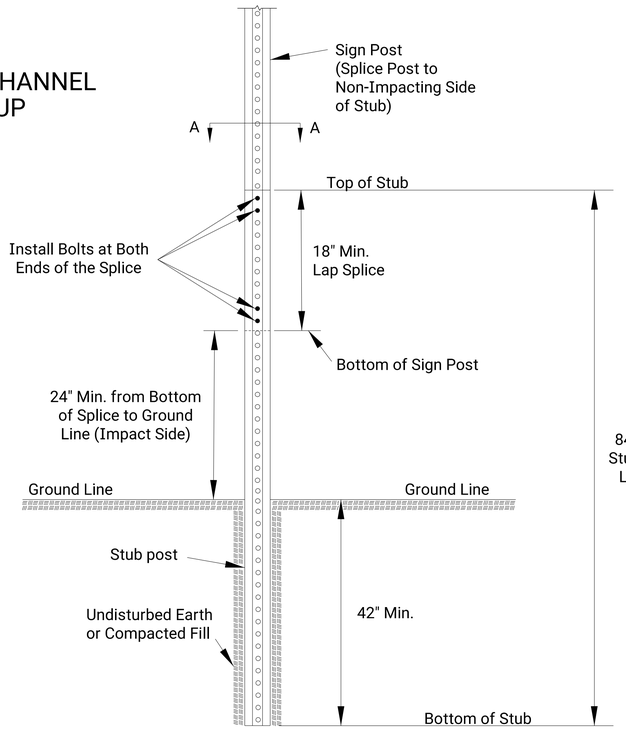
Section B-B



Front Elevation

See TE710 for Additional Details and Requirements

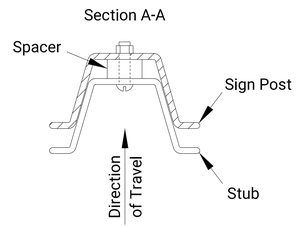
3 LB/F U-CHANNEL SETUP



Notes:

Place two bolts at both ends of the splice through the holes nearest the ends of the splice.

Use manufacturer recommended spacers over the bolts between the spliced pieces of U-Channel.



NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

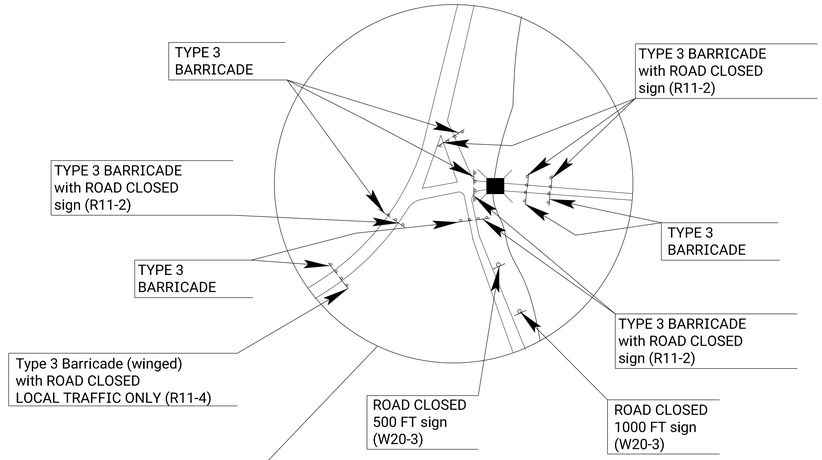
TRAFFIC CONTROL SIGN POSTS

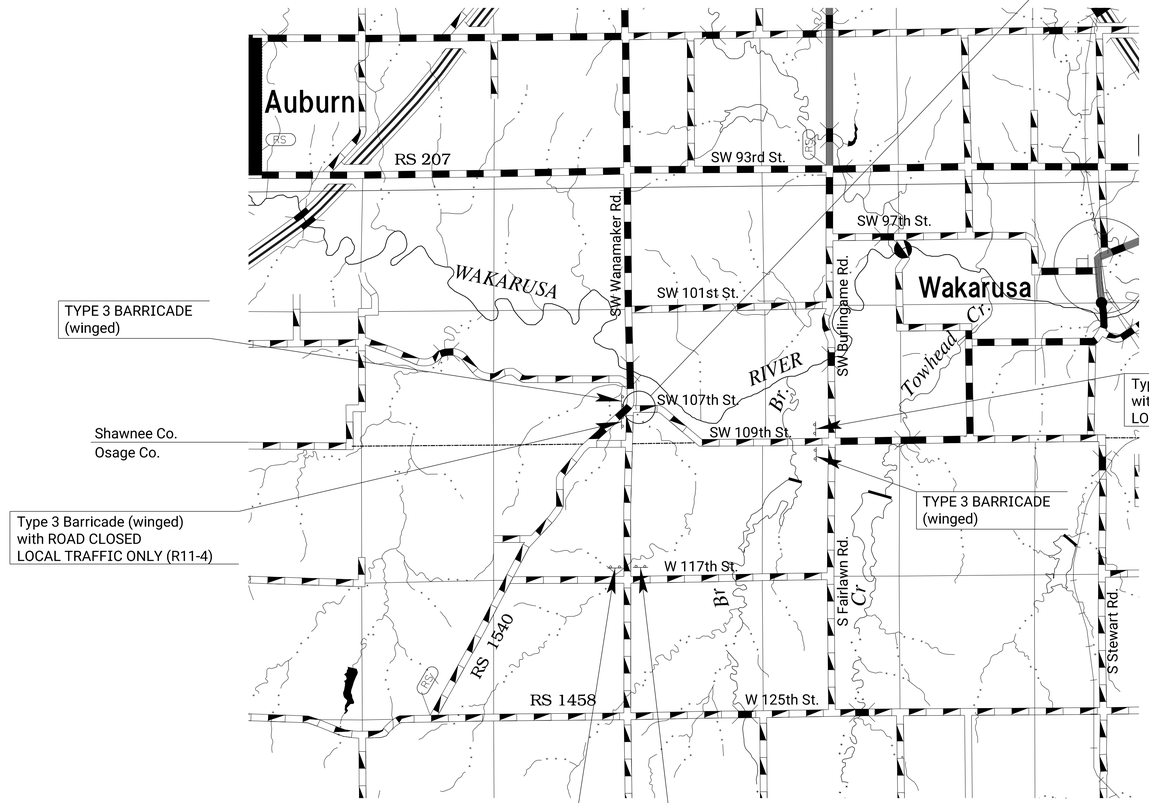
TE712

FHWA APPROVAL		06-01-15	APP'D.		Kristina Ericksen
DESIGNED	B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED	
DESIGN CK.		DETAIL CK.	QUAN.CK.	TRACE CK.	

Plotted : 8/4/2023 4:33:17 PM
Drawn By: CAM
File : TrafficControl.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	38	45





LOCATION MAP

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 to 9.25 Sq.Ft.)		Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)		Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')		Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)		Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)		Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)		Each Per Day
Arrow Display		Each Per Day
Portable Changeable Message Sign		Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)		Sta./Line
4" Solid (Type II)		Sta./Line
4" Broken (8.0') (Type I)		Sta./Line
4" Broken (8.0') (Type II)		Sta./Line
4" Broken (3.0') (Type I)		Sta./Line
4" Broken (3.0') (Type II)		Sta./Line
4" Dotted Extension (Type I)		Sta./Line
4" Dotted Extension (Type II)		Sta./Line
Solid (Line Masking Tape)		Sta./Line
Broken (Line Masking Tape)		Sta./Line
Symbol (Type I)		Each
Symbol (Type II)		Each
Flexible Raised Pavement Marker (4" Broken (8.0'))		Sta./Line
Flexible Raised Pavement Marker (4" Broken (3.0'))		Sta./Line
Pavement Marking Removal		Lin. Ft.
Work Zone Sign (Special) (16.25 Sq. Ft. & Less)	1	Each
Work Zone Sign (Special) (16.26 Sq. Ft. & More)		Each
Rigid Raised Pavement Marker (Type I)		Each
Rigid Raised Pavement Marker (Type II)		Each
Traffic Signal Installation (Temporary)		Lump Sum
Traffic Control (Initial Set Up)		Lump Sum
Traffic Control	Lump Sum	Lump Sum
Flagger (Set Price)		Hour

Barricades ✳		Channelizing Devices ✳		
Type 3 (4' To 12')	Pedestrian	Fixed	Portable	Pedestrian
20				

SUMMARY OF
TRAFFIC CONTROL DEVICES

✳ QUANTITY MOST USED ON THE PROJECT AT ANY ONE TIME

Lighted Devices ✳	
Work Zone Warning Light (Type "A" Low Intensity)	24
Work Zone Warning Light (Red Type "B" High Intensity)	
Arrow Display	
Portable Changeable Message Sign	

Work Zone Signs ✳			
Sign No.	Size - Sq.Ft.		
	0-9.25	9.26-16.25	16.26 & Over
R11-2		6	
R11-3a		1	
R11-4		3	
W20-3		6	

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SUMMARY OF DEVICES RECAPITULATION OF QUANTITIES

~~TE795~~

FHWA APPROVAL	06-01-15	APP'D.	Kristina Ericksen
DESIGNED B.A.H.	DETAILED R.W.B.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

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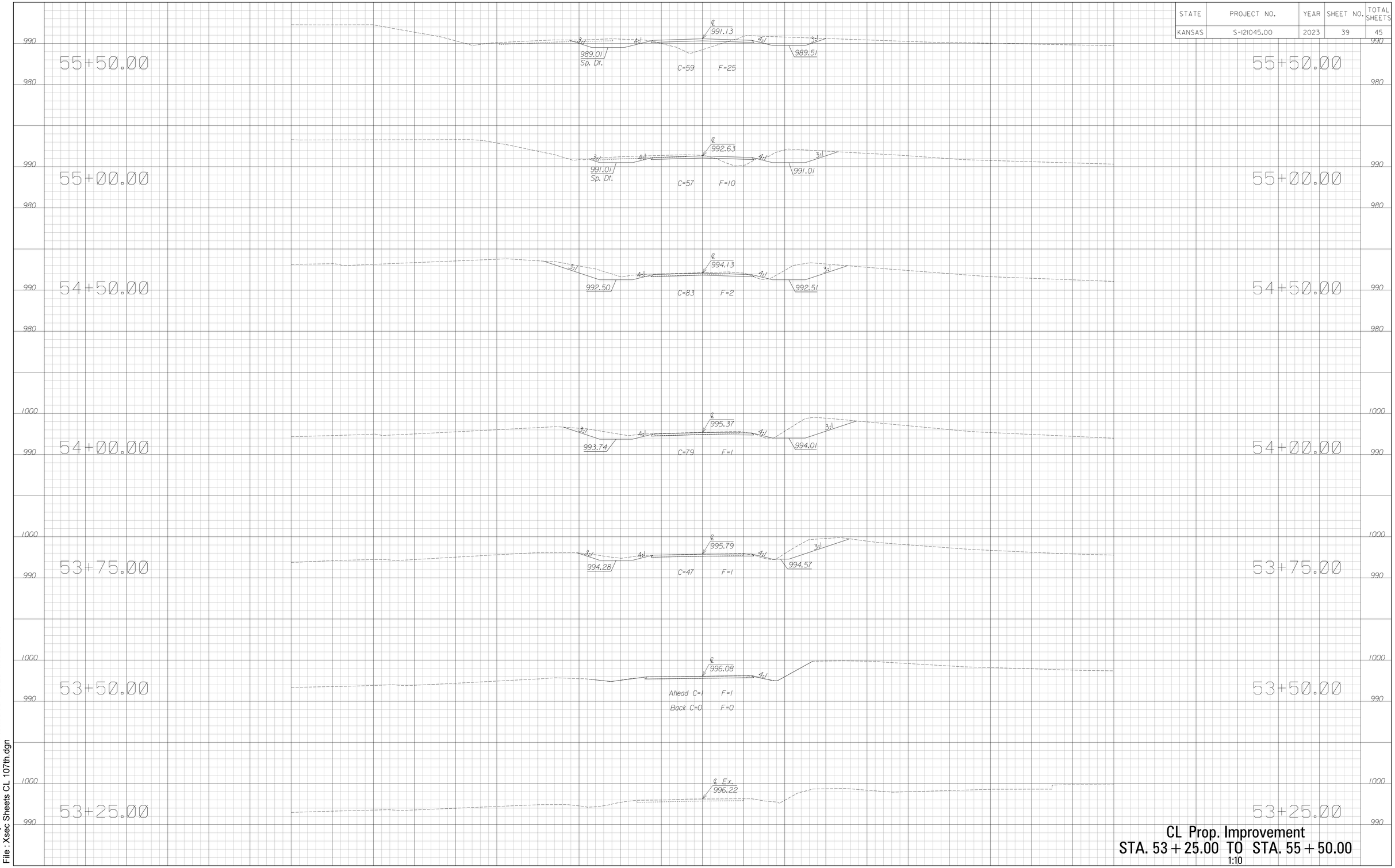
File : :

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	39	45



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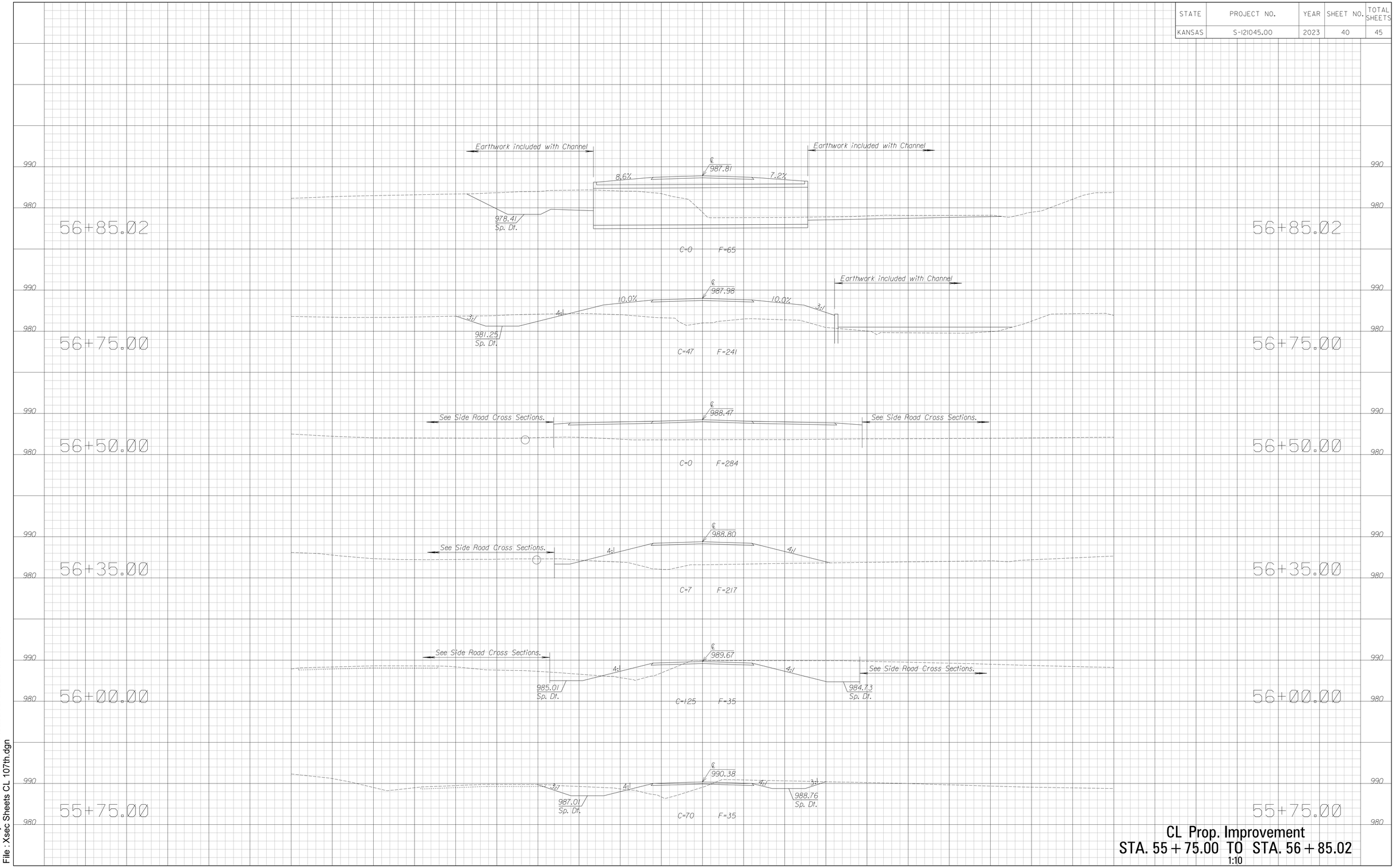
Drawn By : CAM
File : Xsec Sheets CL 107th.dgn

CL Prop. Improvement
STA. 53 + 25.00 TO STA. 55 + 50.00
1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	40	45

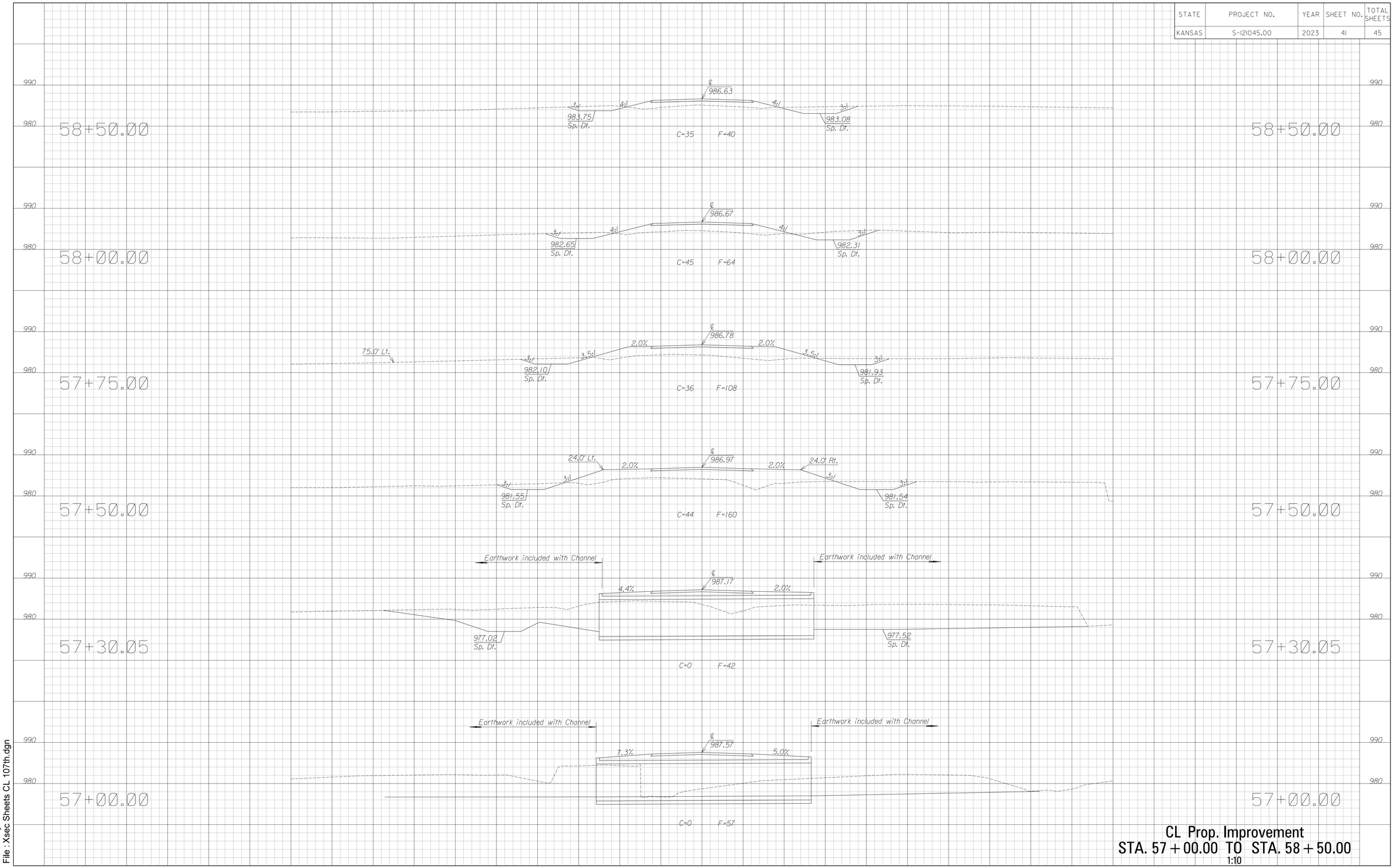


CL Prop. Improvement
STA. 55 + 75.00 TO STA. 56 + 85.02
1:10

Sheet No. 40

Drawn By : CAM
File : Xsec Sheets CL 107th.dgn
Plotted : 8/4/2023 4:33:21 PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	41	45

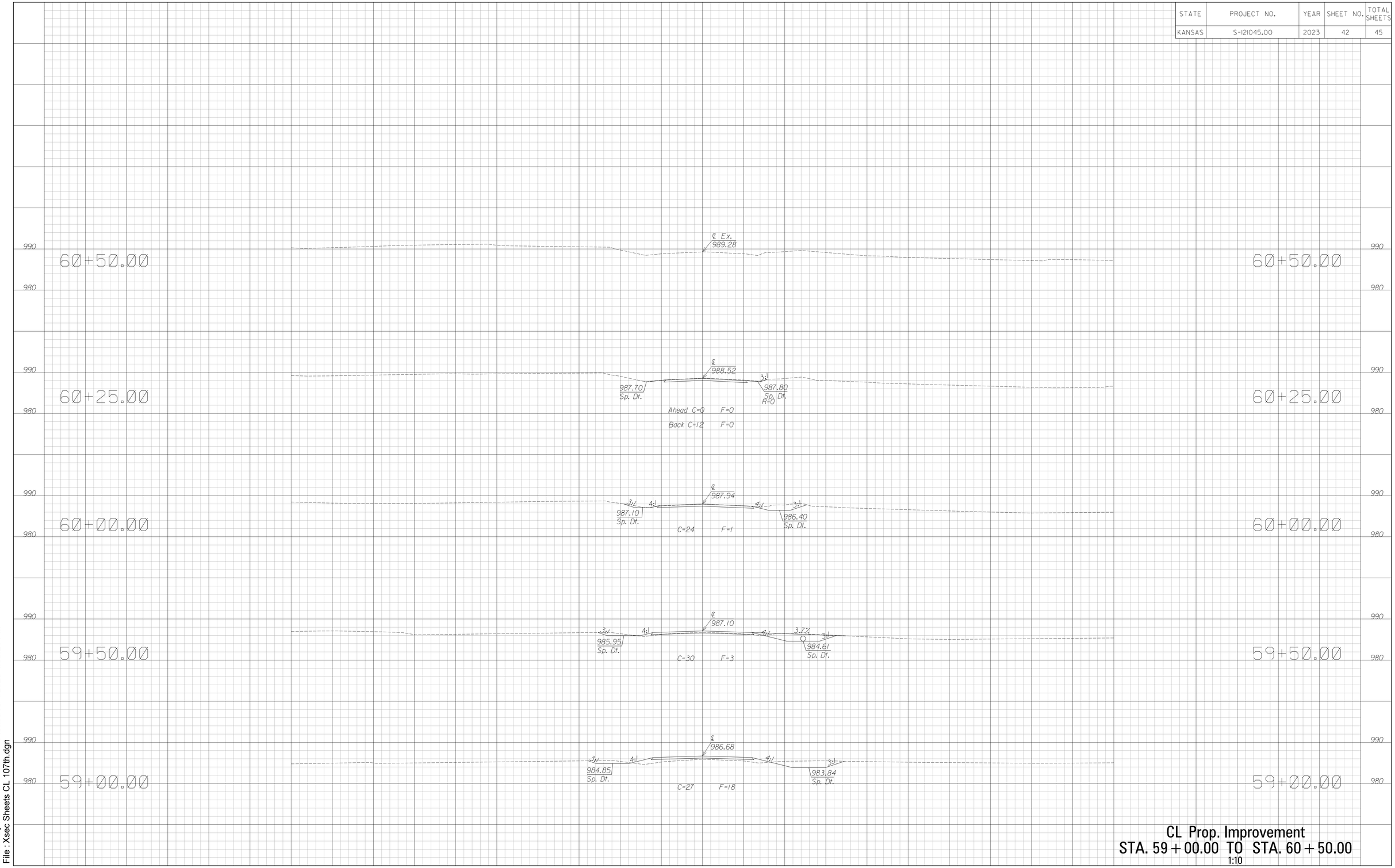


Plotted : 8/4/2023 4:33:21 PM
Drawn By: CAM
File : Xsec Sheets CL 107th.dgn

CL Prop. Improvement
STA. 57+00.00 TO STA. 58+50.00

1:10

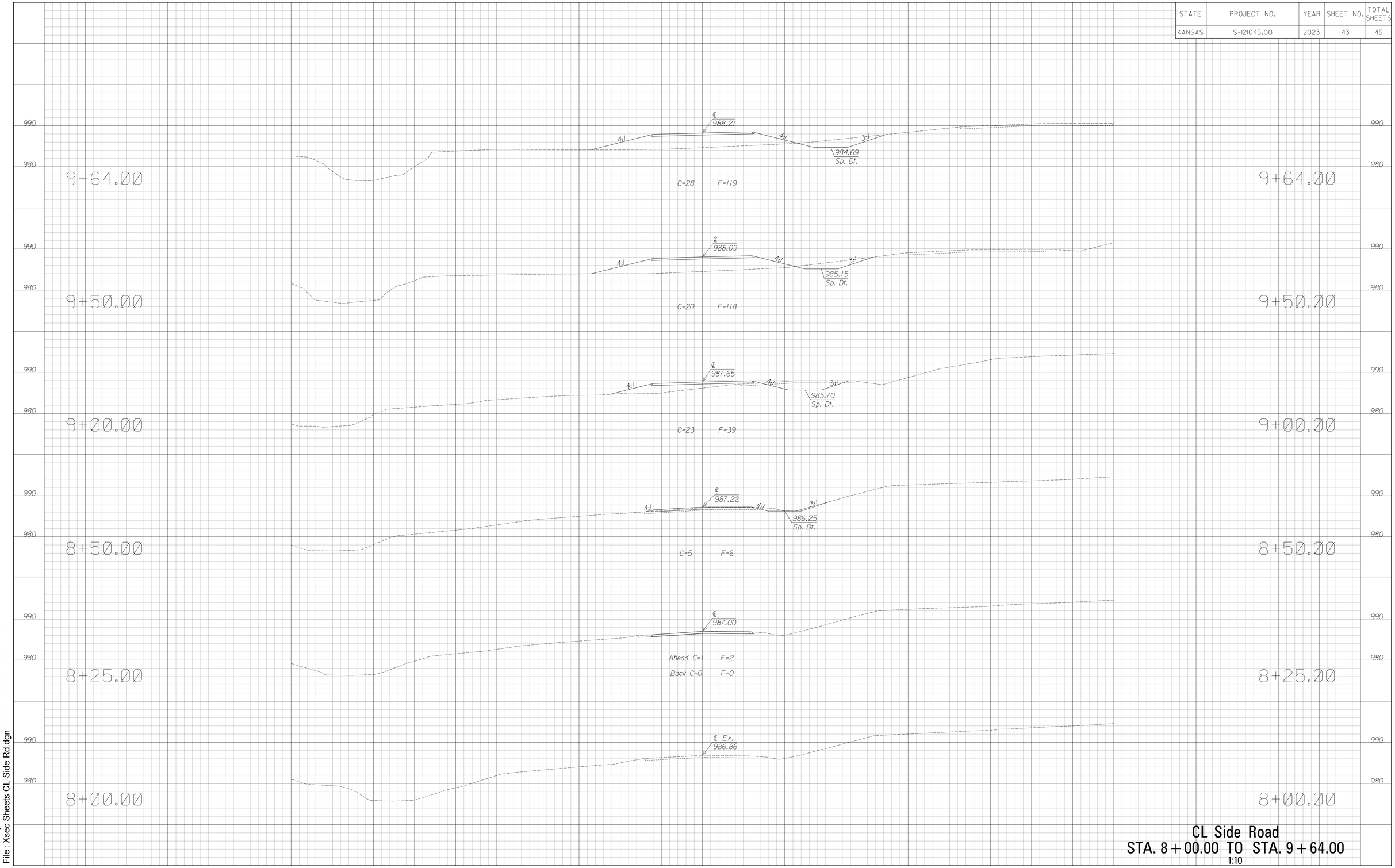
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	42	45



CL Prop. Improvement
STA. 59+00.00 TO STA. 60+50.00
1:10

Plotted : 8/4/2023 4:33:21 PM
Drawn By: : CAM
File : Xsec Sheets CL 107th.dgn

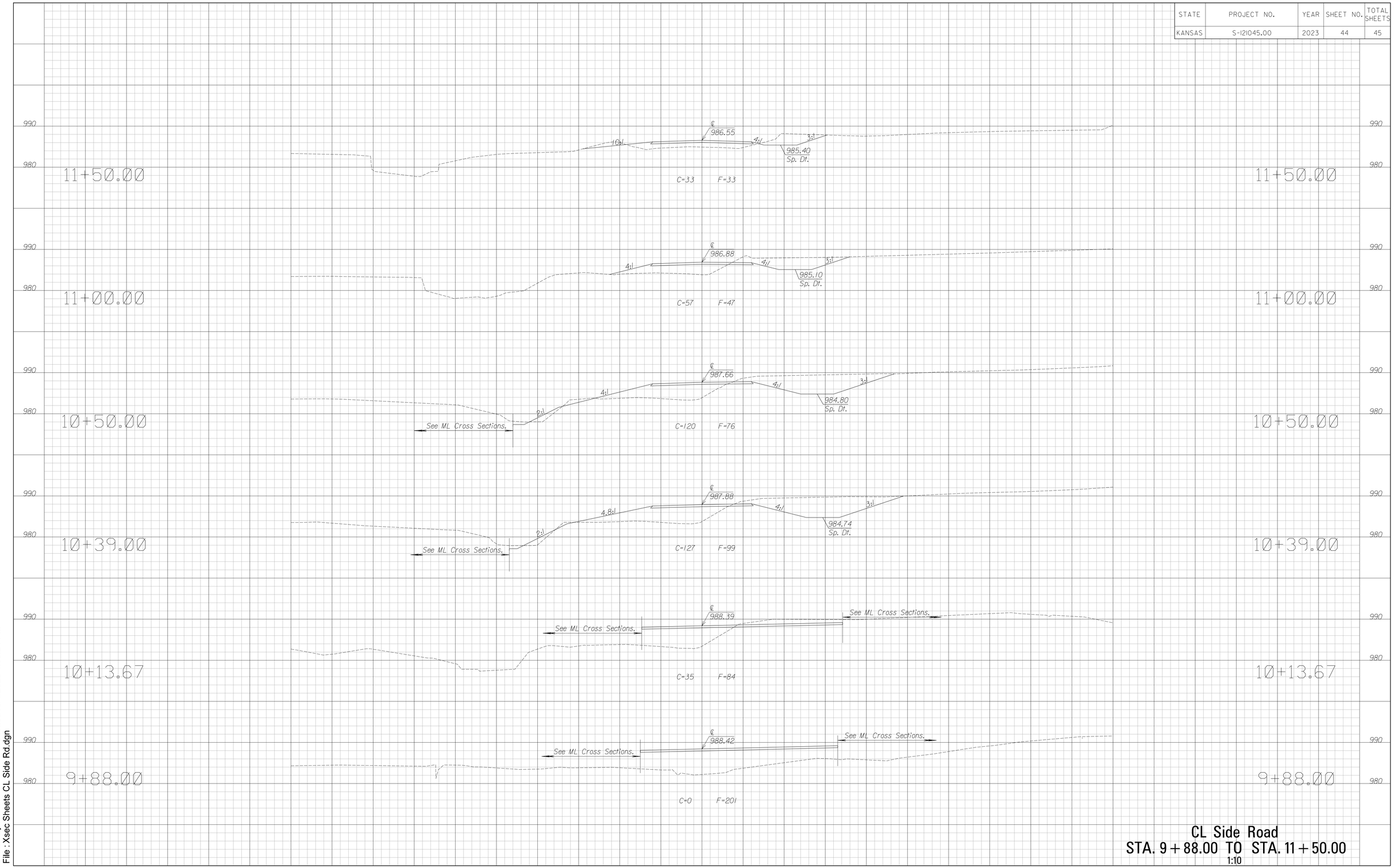
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	43	45



CL Side Road
STA. 8+00.00 TO STA. 9+64.00
1:10

Drawn By: CAM
File: Xsec Sheets CL Side Rd.dgn
Plotted: 8/4/2023 4:33:24 PM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	44	45

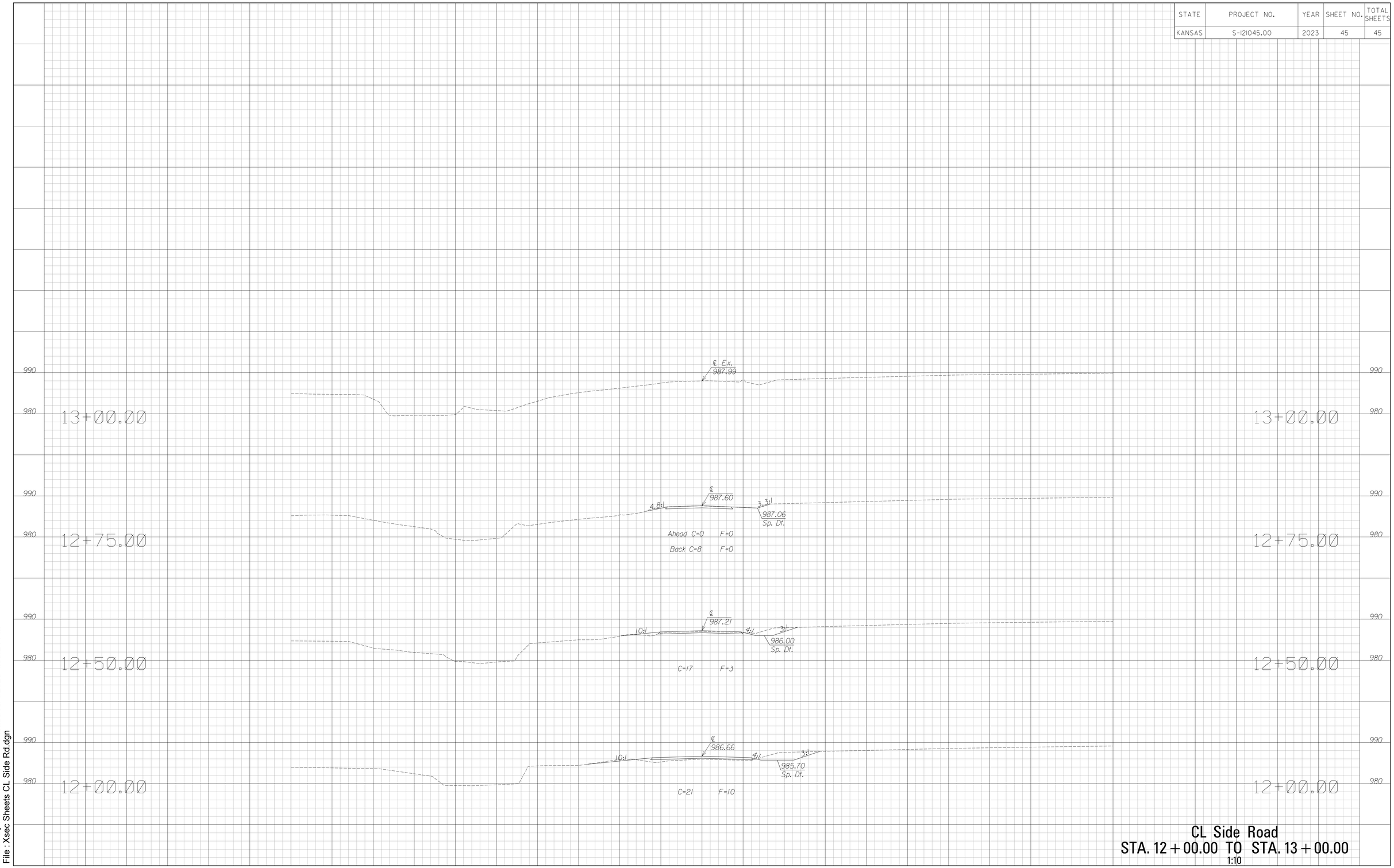


Plotted : 8/4/2023 4:33:24 PM
Drawn By: CAM
File : Xsec Sheets CL Side Rd.dgn

CL Side Road
STA. 9+88.00 TO STA. 11+50.00

1:10

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	S-121045.00	2023	45	45



CL Side Road
STA. 12 + 00.00 TO STA. 13 + 00.00
1:10

Drawn By: CAM
File : Xsec Sheets CL Side Rd.dgn
Plotted : 8/4/2023 4:33:24 PM