# SPECIFICATIONS AND BID DOCUMENTS

For

# LINCOLN COUNTY

Bid No. 24-03

BRIDGE 41-40 35' Steel Beam Bridge on GRS Abutments

August 2023



#### NOTICE TO BIDDERS

Sealed bids will be received at the Lincoln County Courthouse, 811 Manvel Ave., Suite 5, Chandler, Oklahoma 74834, until 8:45 A.M. on the 18<sup>th</sup> of September 2023 and after that time to be publicly opened and read aloud for the work listed below. Clearly mark the lower left-hand corner of your bid envelope with the bid number information and bid due date/time listed above.

Bid Number 24-03 Bridge 41-40 Construct a 35' Steel Beam Bridge on GRS Abutments

This work will be done under the Oklahoma Department of Transportation Standard Specifications for Highway Construction, except as modified herein.

The proposal will include a special provision with reference to Contractor's Non-Collusion Affidavit and a 5% bid bond in a certified or cashier's check or surety bond shall accompany the sealed proposal of each bidder. Evidence of having proper workmen's compensation coverage for employees as provided by Title 85 of the Oklahoma Statutes Section 61 shall be required prior to issuance of a work order.

Examination of plans, specifications, special provisions, and site of work is required.

Plans, forms of proposals, contracts and specifications may be examined at the following locations:

Southwest Construction News www.swcnews.com

F.W. Dodge www.construction.com/dodge

Bid News Construction Report www.bidnews.com

Lincoln County Clerk 811 Manvel Ave, Suite 5 Chandler, Oklahoma 74834 (405)258-1264 EST, Inc. 615 N. Hudson, Suite 300 Oklahoma City, Oklahoma 73102 Engineer of Record: Don Russell (405) 596-8388 donr@estinc.com

A complete set of Plans and Specifications to prospective bidders may be obtained at the above described office of EST, Inc. upon remitting **\$20.00 Non-Refundable Fee** or a PDF copy of the plans can be emailed and used for bidding at no cost. Contact EST, at the above listed information, to inquire about the project.

Rates for liquidated damages for this project will be \$500.00 per calendar day.

Upon award of contract to a successful bidder, the contract will be completely executed within ten

(10) working days from the date of award by the successful bidder and Lincoln County.

Lincoln County hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex or national origin in consideration for an award.

Lincoln County reserves the right to reject any or all bids. The Board of County Commissioners reserves the right to accept the bid determined to best serve the needs of Lincoln County.

LINCOLN COUNTY, OKLAHOMA				
Alicia Wagnon	County Clerk			

### SPECIAL PROVISIONS

#### SCOPE OF WORK

The scope of this project shall include construction of a 35' long steel beam bridge with a concrete deck on GRS Abutments. The beams will be provided by the County at the site. The County will remove the existing bridge and construct the embankment and approach guardrail. The unit price bid shall include all labor and materials, except for the beams, required to complete the bridge in accordance with the enclosed plans and specifications. Plan quantity does not include cut off, lap, or waste. The Contractor shall adjust the bid price to account for any cut off, lap, or waste.

The contractor shall be responsible for all underground utilities. Call OKIE at 1-800-522-6543 two (2) days prior to beginning

### construction. STANDARD SPECIFICATIONS

All work shall be performed in accordance with the "Standard Specifications for Highway Construction", Oklahoma State Highway Commission, 2019 Edition, except as modified herein. The aforementioned specifications are hereby incorporated by reference and shall have full force and effect as though printed herein.

For the purposes of this contract, Lincoln County shall be substituted for "Commission" where it appears in the specifications and "the Engineer" shall mean EST, Inc., 615 N. Hudson Ave., Suite 300, Oklahoma City, Oklahoma 73102.

## CERTIFICATIONS AND TEST REPORTS

The contractor shall be responsible for furnishing the necessary certifications and tests reports for materials used in this project to the Engineer. No material for which a certification or test report is required by these specifications shall be incorporated into the work until a satisfactory certification or test report has been received and approved by the Engineer.

Construction testing will be performed by the Contractor. Copies of all test reports shall be provided to the County and the Engineer.

# TIME OF COMPLETION

All work included in this contract shall be completed within ninety (90) calendar days. Rates for liquidated damages for this project will be \$500.00 per calendar day.

### BASIS OF MEASUREMENT AND PAYMENT

Payment will be made at the unit price bid. The price bid shall include all labor, materials and equipment necessary to complete the bridge.

Lincoln County shall make three (3) payments for each bridge to the Contractor in the following manner: one (1) payment will be made when the abutments are complete, one (1) payment will be made when the superstructure is complete and the final 10% will be paid when the construction is accepted by Lincoln County. The Contractor will furnish to the County a statement for all materials and labor for each claim. The statement will include proof of payment of all labor and materials used up to such statement date. The County will review and verify all costs before processing for payment.

# **REQUIREMENTS**

The Contractor shall furnish:

- 1 Performance Bond
- 2- One Year Maintenance Bond
- 3- Certificate of Insurance
- 4 Statutory Bond

#### CONTRACT

This co	ntract and	agreeme	nt, made and	entered int	o this	day of	, 2	:023 by a	and bet	ween the
		•	mmissioners,						the	"Owner"
and					hereaft	er called the	"Contractor",			
WITNES	SSETH:									
contract docume	documents nts, and ha proposals fo Bid Numbe	s for the sas cause or the furer 24-03	aused to be pr work herein aft d Solicitation fon nishing of all la	er describe or bids to be bor and ma	d and has e given and aterials for	approved and advertised a	d adopted all	of said c	ontract	
as outlin			e bid document	_			s and provisi	ons of thi	is contra	act;
and,							·			
	and at the	time spe	ontractor, in res cified, a sealed rner <b>i</b> n a <b>l</b> ike m	I proposal ir	n accordar	nce with the te	erms of this o	ontract; a	and,	
the prop	osa <b>l</b> s subn	n <b>i</b> tted and	d has determine	ed and dec	lared the a	bove name C	Contractor to	be the lov	vest res	sponsible
bidder o	n the above	e describ	ed project, and	d has duly a	warded <b>t</b> h	nis contract to	said Contra	ctor, for th	ne	
sum na	med in the	proposal	I, to wit:							
						dollars (\$				-
			nd in consider agreed, and he				and covenan	ts herein	contair	ned, the

1. Contractor shall, in a good and first-class workmanlike manner, at his own cost and expense, furnish all labor, materials, tools and equipment required to complete said work in strict accordance with this Contract and the following Contract documents:

All documents are as fully a part of this Contract as if hereto attached or herein fully set out, forms the entire Contract between the parties hereto.

- 2. Owner shall make a partial payment to the Contractor when the abutments are complete, when the superstructure is complete, and shall make the final payment upon completion, inspection, and acceptance of the project.
- 3. Contractor shall be deemed an independent contractor at all times during the progress of construction as said improvements notwithstanding the supervision and inspection by the Owner. The Contractor agrees to hold the Owner harmless on any liability that may arise and shall provide a certificate of insurance certifying the same.
- 4. On completion of work, but prior to the acceptance thereof, the Owner, or his representative, will determine by examination that said work has been completely and fully performed in accordance with Contract Documents. The Contractor shall fully furnish proof that all claims and obligations incurred by him in connection with the performance of said work have been fully paid and settled; said information shall be in the form of an affidavit which shall bear the approval of the surety on the Contract Bonds for payment of the final estimate to the Contractor. Thereupon, the final estimate shall be approved and paid. Provided, however, that such payments and final payments shall not be deemed or construed as proof that said improvement was constructed in strict compliance with the Contract and the specifications therefore, and the Owner hereby reserves the right to recover from Contractor any damage it may sustain for noncompliance herewith.
- 5. The Owner requires the Contractor to carry insurance against damage from fire and the elements during the process of construction to the extent of protection of said Owner equity in said project until accepted by said agency.

- 6. All work shall be completed 90 calendar days from notice to proceed date. Contractor and Owner, recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified above, plus any extensions thereof allowed in accordance with Section 108.07 of the Standard Specifications. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration 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 \$500.00 for each day that expires after the time specified for completion.
- 7. Contractor shall exercise all reasonable precautionary measures during the progress of construction and repairs and shall be responsible for erecting adequate and visible barricades and detour signs so as to warn and protect persons and property from injury or damage, shall reimburse the Owner and hold Owner harmless from any and all claims or judgments against if by reason of Contractor's failure or neglect to comply with this provision, whether such be the result of a failure or neglect of Contractor, its agents, servants, employees, subcontractors or others.

In witness thereof, the parties hereto have caused this instrument to be executed, the day and year first above written.

	CONTRACTOR
	Title
	Address
Subscribed and sworn before me this	day of2023.
Notary	
My Commission expires	Commission Number
ATIEST:	BOARD OF COUNTY COMMISSIONERS, LINCOLN COUNTY
County Clerk	Chairman
	Member
Approved as to legality and form:	Member
District Attorney	

# PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That We\_\_\_\_\_, as

Principal, and	, as Surety, are held
and firmly bound unto the Lincoln County of the	
of	
(\$), such sum being equa	
payment of which, well and truly to be made,	we, and each of us, bind ourselves, our heirs,
executors and assigns, themselves, and its su	accessors and assigns, jointly and severally,
firmly by these presents.	
Dated this day of	, 2023. The conditions of this
obligation are such, that whereas, said Princip	
making of the following work and improvemen	ts:
Bid Number 24-03	
Construction of a 35' Steel Beam Bridge	on GRS Abutments
entered into a certain written contract with the	Lincoln County on theday of
, 2023, for the construct	tion of said work and improvement, all in
compliance with the plans and specifications the	nerefore, made a part of said contract and on
file in the Office of the Lincoln County Clerk, a	nd said contract is hereby made a part and
parcel of this bond as if literally written herein.	
NOW, THEREFORE, if the said	
Principal, shall fully and faithfully execute the v	vork and perform said contract according to
its terms, conditions, and covenant, and in exa	ct accordance with the bid of said Principal,
and according to certain plans and specification	ns heretofore made, adopted, and placed on
file in the Office of the Lincoln County Clerk, ar	nd in accordance with the prevailing Wage
Scale promulgated by the Commissioner of La	bor, pursuant to the provisions of 40 O.S.,
1965 Supp. 196.1 - 196.12, as set out in the s	pecification herein, and shall promptly pay or
cause to be paid, all labor, material and/or repa	airs and all bids for labor performed on said
work, whether by subcontract or otherwise, and	d shall protect and save harmless the said
Lincoln County and all interested property owner	ers against all claims, demands, causes of
action, losses or damage, and expense to life of	or property suffered or sustained by any

person, firm or corporation by reason of negligence of the Contractor or his or its agents, servants, or employees in the construction of said work, or by or in consequence of any improper execution of the work or act of omission or use of inferior materials by said Contractor, or his or its agents, servants, or employees, and shall protect and save Lincoln County harmless from all suits and claims of infringement or alleged infringement of patent rights or processes, then this obligation shall be void; otherwise, this obligation shall remain in full force and effect.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them from the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the 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 so to do, the day and year first above written.

	В	By
		Principal
ATTEST:		
Witness-Secretary		
	В	By
ATTEST:		·
Secretary	_	
	В	BySurety

# MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS:	
That We,	, as Principal,
and, as Surety,	are held and
firmly bound unto Lincoln County of the State of Oklahoma, in the full and just	t sum of
dollars	(\$
such sum being equal to the contract price for a period of one (1) year for the	payment of
which, well and truly to be made, we, and each of us, bind ourselves, our hei	rs, executors,
and assigns, themselves, and its successors and assigns, joint and severally	, firmly by
these presents.	
Dated thisday of, 2023. The	
conditions of this obligation are such, that whereas, said Principal has by a ce	ertain contract
between	and
Lincoln County, dated thisday of, 2023,	, agreed to
road construction on:	

Bid Number 24-03 Construction of a 35' Steel Beam Bridge on GRS Abutments

all in compliance with the plans and specifications therefore, made a part of said contract and on file in the Office of the Lincoln County Clerk; and to maintain the said improvement in the amounts set forth above against any failure due to workmanship or material for a period of one (1) year from the date of acceptance by Lincoln County.

NOW, **THEREFORE**, if said Principal shall pay or cause to be paid to Lincoln County, all damage, loss, and expense which may result by reason of defective materials and *I* or damage, loss, and expense which may result by reason of defective materials and *I* or workmanship in connection with said work occurring within a period of one (1) year from and after acceptance of said project by Lincoln County, then this obligation shall be null and void, otherwise to be and remain in full force and effect.

It is further agreed that if said Principal of Surety herein shall fail to maintain said improvements against any failure due to defective workmanship and *I* or material from a period of one (1) year and at any time repairs shall be necessary that the cost of making said repairs shall be determined by Lincoln County, or some person or persons designated by them to ascertain the same and if, upon thirty (30) days notice, the said amount

ascertained shall not be paid by the Principal of Surety herein, or if the necessary repairs are not made, that said amount shall become due upon the expiration of thirty (30) days and suit may be maintained to recover the amount so determined in any Court of competent jurisdiction. And that the amount so determined shall be conclusive upon the parties as to the amount due on this bond for the repair or repairs included therein, and that the cost of all repairs shall be so determined from time to time during the life of this bond as the condition of the improvements may require.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties or any of them, from the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers; and the 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 so to do, the day and year first above written.

	Principal
ATTEST:	
	BY
Witness-Secretary	
ATTEST:	Surety
	BY
Secretary	

## STATUTORY BOND

KNOW ALL MEN BY TH	ESE PRESENTS:
That We,	as Principal, and
	, as Surety, are held and firmly bound Lincoln County in the
	Dollars(\$),
such sum being equal to	100% of the contract price for the payment of which, well and truly
to be made, we, and each	n of us, bind ourselves, our heirs, executors and assigns,
themselves, and its succ	essors and assigns, jointly and severally, firmly by these presents.
Dated this	day of, 2023. The conditions of this
obligation are such, that	whereas, the above bonded Principal
is the lowest and best b	dder for the making of the following work and improvements:
Bid Number 24-0 Construction of a	35' Steel Beam Bridge on GRS Abutments
and has entered into a c	ertain written contract with Lincoln County on theday of
	2023, for the erection and construction of said work and
improvement, in exact a	ccordance with the bid of said Principal, and according to certain
plans and specifications	neretofore made, adopted, and placed on file in the Office of the
Lincoln County Clerk.	

NOW, THEREFORE, if said Principal shall fail or neglect to pay all indebtedness incurred by said Principal or subcontractor of said Principal who perform work in the performance of such, for labor and materials furnished by any supplier and consumed in the performance of said contract, and such repairs to and rental of machinery and equipment as may be furnished by a subcontractor to the person or persons contracting with Lincoln County and in accordance with the Prevailing Wage Scale promulgated by the Commissioner of Labor and on file in the office of the Secretary of

State pursuant to the provisions of 40 O.S., 1965 Supp. 196.1-196.12, within thirty (30) days after the same becomes due and payable, the person, firm or corporation entitled thereto may sue and recover on this bond the amount so due and unpaid.

It is further expressly agreed and understood by the parties hereto that no changes or alterations on said contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, for the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the 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 so to do, the day and year first above written.

ATTEST:	By	
	Principal	
Witness-Secretary	_	
ATTEST:	Ву	
	Surety	
Secretary		

# BID PROPOSAL FORM BID NUMBER 24-03

OWNER: LINCOLN COUNTY COMMISSIONERS

811 Manvel Ave.

Suite 5

Chandler, Oklahoma 74834

PROJECT: Bid Number 24-03

Construction of a 35' Steel Beam Bridge on GRS Abutments

- The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter an Agreement with OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract time indicated in this Bid and in accordance with the Contract Documents.
- 2. BIDDER accepts all of the terms and condition of the Instruction to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain open for sixty (60) days after the day of Bid opening. BIDDER will sign the Agreement and submit the Contract Security and other documents required by the Contract documents within ten (10) days of the date of Owner's Notice of Award.
- 3. In submitting this, BIDDER represents, as more fully set forth in the Agreement, that:

(a) BIDDER has examined	I copies of all the	Contract Documents	and of the	following	addenda
-------------------------	---------------------	--------------------	------------	-----------	---------

Date		Number
	•	

(receipt of all of which is hereby acknowledged) and also copies of the Advertisement of Invitation to Bid and the Instructions to Bidders;

- (b) BIDDER has examined the site and locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations) and the conditions affecting cost, progress or performance of the Work and has made such independent investigations as BIDDER deems necessary.
- (c) 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, organizations 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 included any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over another Bidder or over OWNER.
- 4. BIDDER accepts the provisions of the Agreement as to liquidated damages of \$500.00 for each consecutive calendar day in the event of failure to complete in 90 days upon Notice to Proceed.
- 5. The following documents are attached to and made a condition of this Bid:
  - (a) Required Bid Security in the form of a Bid Bond, Certified Check or Cashier's Check.
  - (b) Anti-collusion Affidavit
  - (c) Business Relationships Affidavit
  - (d) Certificate of Non-discrimination

ITEM NO.	DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	TOTAL PRICE
BRIDGE 41-4	10				
202(A) 2210	UNCLASSIFIED EXCAVATION	CY	1100.00		
303(A) 120	O AGGREGATE BASE TYPE A	CY	700.00		
326(A) 120	GEOTEXTILE REINFORCEMENT	SY	3000.00		
501(B) 130	SUBSTR EXCAVATION COMMON	CY	126.00		
506(A) 7230	STRUCTURAL STEEL	LB	5491.00		
509(A) 0210	CLASS AA CONCRETE	CY	33.00		
511(A) 2210	REINFORCING STEEL	LB	4668.00		
542 9102	(PL) INSTALLATION OF BRIDGE ITEM	IS SF	1960.00		
601(B) 1230	TYPE 1-A PLAIN RIPRAP	TON	200.00		
601(I) 1700	FILTER FABRIC (RIPRAP)	SY	80.00		
SP	24 GA. TENSILE FORM	SF	1215.00		
SP	BEAM GUARDRAIL ON THE BRIDGE	LF	100.00		
SP	PAINT BEAMS	LS	1.00		
SP	CONSTRUCTION TESTING	LS	1.00		
	SUB-TOTA	L BRID	GE 41-40		
TOTA	L BID				
			Dolla	ars(\$	)

The undersigned, as bidder, declares under oath that the only person or parties interested in the foregoing proposal as principals are those named herein; that this proposal is made without either directly or indirectly entering into any agreement, participating in any collusion, or otherwise taking any action in restraint of free competitive bidding in connection therewith; that the undersigned has no financial interest in or other affiliations in a business way with any other bidder for the contract on this project; that careful examination of instructions to bidders, specifications, and the plans therein referred to has been made, and that careful examination of the locations, conditions and classes of materials of the proposed work has been made; and the undersigned agrees to provide all the necessary machinery, tools, apparatus, and other means of construction, and will do all the work and furnish all the materials called for in the contract and specifications in the manner prescribed therein and according to the requirements of the Engineer at the price as above set forth.

The undersigned further proposes to enter into contract within ten (10) days after receipt of notice that the work has been awarded to the undersigned, to commence work as directed by the work order from the Engineer and to complete the entire work within ninety (90) calendar days after work is authorized. The time limit and other limiting conditions herein set forth are hereby accepted and if such requirements are changed, it is understood that such change will invalidate this bid.

It is understood that Lincoln	County reserves the	right to reject an	y or all bids.
Respectfully submitted,			
		•	
			(Address)
NAME OF CONTRACTOR		_	
			(Telephone No.)
(Signature)		(Title)	
STATE OF OKLAHOMA ) COUNTY OF )	SS.		
Subscribed and sworn to be day of	efore me, the undersign , 2023.	ned, a Notary Pu	blic in and for the State of Oklahoma this
		NOTARY PUBI	LIC
My commission expires:	Commission Nu	ımber:	

# **ANTICOLLUSION AFFIDAVIT**

The following affidavit is submitted by Bidder as a part of this bid and proposal:
STATE OF OKLAHOMA ) COUNTY )
The undersigned deponent, of lawful age, being duly sworn, upon his oath deposes and says: That he has lawful authority to execute the within and foregoing proposal; that he has executed the same by subscribing his name hereto under oath for and on behalf of said bidder; that bidder has not directly or indirectly entered into any agreement, express or implied, with any bidder or bidders, having for its object the controlling of the price of amount of such bid or bids, the limiting of the bids or the bidders, the parceling or farming out to any bidder or bidders or other persons of any part of the contract or any part of the subject matter of the bid or bids or of the profits thereof, and that he has not and will not divulge the sealed bid to any person whomsoever, except those having a partnership or other financial interest with him in said bid or bids, until after the said sealed bid or bids are opened.
Deponent further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any state official or employee as to quantity, quality, or price in the prospective contract, or any other terms of said prospective contract; or in any discussion between bidders and any County Official concerning exchange of money or other thing of value for special consideration in the letting of a contract; that the bidder/contractor has not paid, given or donated or agreed to pay, give or donate to any officer or employee of Lincoln County any money or other thing of value, either directly or indirectly, in the procuring of the award of contract pursuant to this bid.
Signed
Name of Bidder
Ву
Title
Subscribed and sworn to before me this day of, 2023.

# **BUSINESS RELATIONSHIPS AFFIDAVIT**

STATE OF
STATE OF
, of lawful age, being first duly sworn, on oath
says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant
further states that the nature of any partnership, joint venture, or other business
relationship presently in effect or which existed within one (1) year prior to the date of this
statement with the architect, engineer, or other party to the project is as follows:
Affiant further states that any such business relationship presently in effect or which existed
within one (1) year prior to the date of this statement between any officer or director of the
bidding company and any officer or director of the architectural or engineering firm or other
party to the project is as follows:
Affiant further states that the names of all persons having any such business relationships
and the positions they hold with their respective companies or firms are as follows:
(If yours of the business valetienships begainstten magnificand sviet offices about a state)
(If none of the business relationships hereinafter mentioned exist, affiant should so state.)
Signature of Company Official
Cubacuibad and automata bafara manthia
Subscribed and sworn to before me thisday of, 2023.
Notany Dublia
Notary Public

# CERTIFICATE OF NON-DISCRIMINATION

In connection with the performance of work under this contract, the contractor agrees as follows:

- A. The Contractor agrees not to discriminate against any employee or applicant for employment because of race, color, sex, national origin or ancestry. The Contractor shall take affirmative action to insure that employees are treated without regard to their race, creed, color, national origin, sex, or ancestry. Such actions shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruiting or recruitment, advertising, lay-off, or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Contractor and Sub-Contractor shall agree to post in conspicuous place, available to employees and applicants for employment notices to be provided by the Lincoln County Clerk setting forth provisions of this section.
- B. In the event of the Contractor's non-compliance with this non-discrimination clause, the contract may be canceled or terminated by Lincoln County. The Contractor may be declared by Lincoln County ineligible for further contracts with the said agency until satisfactory proof of intent to comply shall be made by the Contractor.
- C. The Contractor agrees to include this non-discrimination clause in any subcontracts connected with the performance of this agreement.

I have read the above stated clause and agree to abide by its requirements.

	CONTRACTOR
Subscribed and sworn to before m	e thisday of, 2023.
	Notary Public
Commission Expires:	Commission Number:

# STATUS VERIFICATION SYSTEM AFFIDAVIT

STATE OF OKLAHOMA )	) SS:
COUNTY OF)	) 33.
I,oath states:	, of lawful age, and having been first duly sworn, on
of Oklahoma. I am fully aware of the fact	the Contractor to submit the attached contract to the State is and circumstances surrounding the making of the ed and have been personally and directly involved in the
	stered and fully participates in the Status Verification S. § 1313(B)(1), to verify the work eligibility status of all
FURTHER AFFIANT SAITH NOT.	
	AFFIANT
Subscribed and sworn before me thisda	ay of, 20
	Notary Public
Commission Expires:	Commission Number

# \_DESIGN DATA\_

**AADT 2022** AADT 2042 = ▲ 100 = 45 MPH

# \_SCALES\_

PROFILE HORIZONTAL 1" = 50' PROFILE VERTICAL 1" = 5' LAYOUT MAP



# CONVENTIONAL SIGNS

PROPOSED ROAD ### RAILROADS TOWNSHIP AND RANGE SECTION LINES QUARTER SECTION LINES **FENCES** GROUND LINE EXISTING ROADS BASE LINE GRADE LINES TELEPHONE AND TELEGRAPH -0-1-0-POWER LINES **-**Φ-**⁄**-Φ-OIL WELL

**≔=**ξ

PRES.R/W\_\_\_\_

R/W\_





019 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION GOVERN, APPROVED BY HE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, DECEMBER 18, 2019.

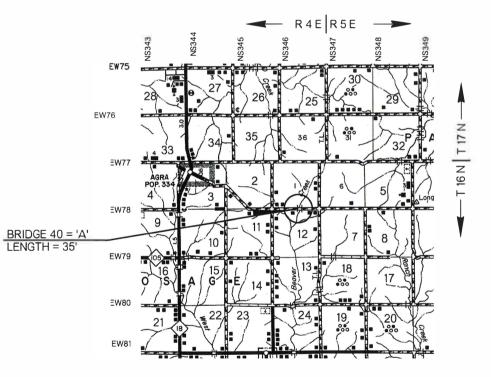
# LINCOLN COUNTY

# PLAN OF PROPOSED LINCOLN COUNTY BRIDGE

BID NO. COM2-XXXX

BRIDGE '40'

LOCATION NO. 41E0780N3460006 LATITUDE 35°53'02.65", LONGITUDE 96°49'49.68" NBI NO. 33213 (EXISTING NBI 02568)



# PROJECT LENGTH BASED ON CRI

TI MOOFCE FEIN	JIII DAJLU	OIT CITE	
ROADWAY LENGTH	650.00 FT		0.12 MILES
BRIDGE LENGTH	35.00 FT		O.O1 MILES
PROJECT LENGTH	700.00 FT		O.13 MILES
EQUATIONS: NONE			
EXCEPTIONS: NONE			

# \_INDEX OF SHEETS\_

# \_SHEET\_DESCRIPTION\_

SHEET NO.

TITLE SHEET TYPICAL SECTION SUMMARY OF PAY QUANTITIES 01 02 03 04 05 06 07 SUMMARY OF PAY GUANTI TIES GENERAL PLAN AND ELEVATION - BRIDGE 'A' BRIDGE 'A' ABUTMENT DETAILS BRIDGE 'A' SUPERSTRUCTURE DETAILS PLAN AND PROFILE

### FHWA GRS-IBS ABUTMENTS

COVER SHEET DESIGN DIMENSION & QUANTITIES FACING BLOCK SCHEDULE DETAILS

# \_REQUIRED STANDARD DRAWINGS\_

\_ROADWAY (2019) TRAFFIC (2009)

> SSS-2-0 TSC2-4-0 TSD-3-0 TCS1-1-01 TCS2-1-00 TCS3-1-01 TCS4-1-01 TCS5-1-00 TCS6-1-02 TCS7-1-02 TCS8-1-00 TCS9-1-01

APPROVED THIS 1 DAY OF Nor. 8022 BOARD OF COUNTY COMMISSIONERS LINCOLN COUNTY, OKLAHOMA



ROFESSIO

KEVIN A.

KRIEWALL

14850

OKLAHOM

EST, INC. C.A. NO. 3639

SELECTERIFICATE OF AUTHORIZATION NO. 3639 (PE/LS)

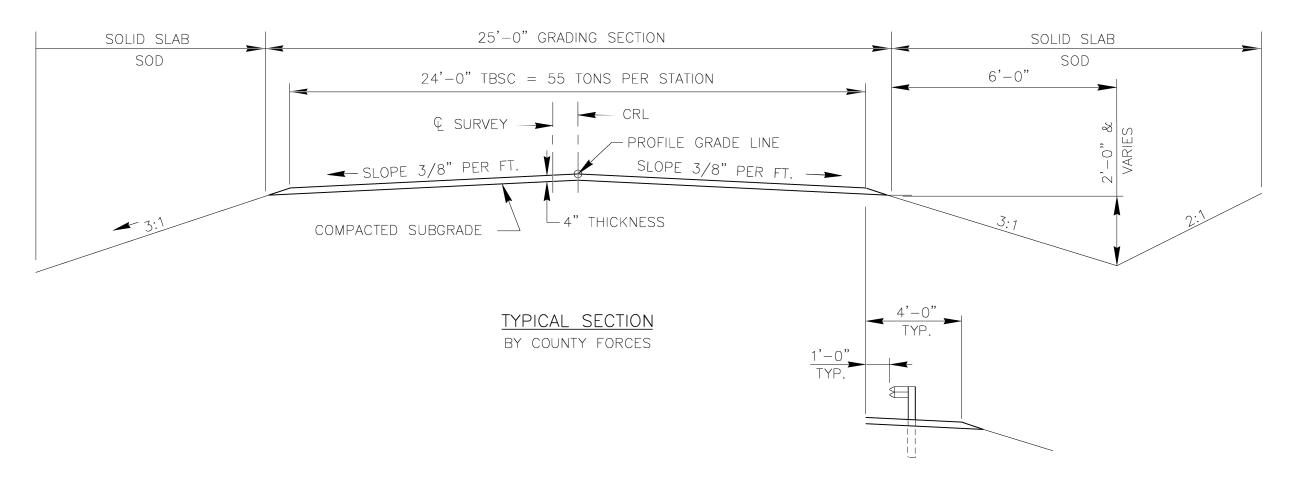
U.S. DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

OMMENDED FOR APPROVAL:

REGIONAL HIGHWAY ENGINEER

SHEET NO. 01





# GUARDRAIL WIDENING

BY COUNTY FORCES
(BOLT RAIL DIRECTLY TO POST -DO NOT WELD)



LINCOLN COUNTY

TYPICAL SECTION

BEAM BRIDGE 40

SHEET NO.

### GENERAL NOTES-BRIDGE

COMPLY WITH THE REQUIREMENTS OF THE OKLAHOMA DEPARTMENT OF TRANSPORTATION 2019 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EXCEPT AS MODIFIED BY THE PLANS AND SPECIAL PROVISIONS

EXISTING ROAD WILL BE CLOSED TO THROUGH TRAFFIC BY THE COUNTY.

LINCOLN COUNTY SHALL BE RESPONSIBLE FOR ACQUIRING RIGHT-OF-WAY AND RELOCATION OF UTILITY LINES AND FENCES AS NECESSARY PRIOR TO CONSTRUCTION.

IN ACCORDANCE WITH THE OKLAHOMA UNDERGROUND FACILITIES DAMAGE PREVENTION ACT THE CONTRACTOR SHALL NOTIFY THE OKLAHOMA ONE-CALL SYSTEM, INC. 48 HOURS PRIOR TO BEGINNING EXCAVATION. OKLAHOMA ONE-CALL SYSTEM, INC. "CALL OKIE" 1-800-522-6543 OR 811.

THE COUNTY WILL PROVIDE THE BRIDGE BEAMS AND DELIVER THEM TO THE BRIDGE SITE.

COUNTY WILL PERFORM GRADE, DRAIN, AND SURFACE AT BRIDGE.

COUNTY WILL INSTALL APPROACH GUARDRAIL.

#### PAY QUANTITY NOTES

- (R-11) THE QUANTITIES ESTIMATED FOR TEMPORARY EROSION AND SEDIMENT CONTROL IS 0.60 ACRES
- (R-20) ESTIMATED AT 120 LBS. PER CU. FT.
- (1) TO BE PAID AT PLAN QUANTITY. PLAN QUANTITY DOES NOT INCLUDE CUT OFF, LAP, OR WASTE.

  THE CONTRACTOR SHALL ADJUST THE BID PRICE TO ACCOUNT FOR ANY CUT OFF, LAP, OR

  WASTE
- (2) PAYMENT TO THE CONTRACTOR WILL BE BASE ON PLAN QUANTITIES ONLY.
- (3) INCLUDE ALL COST OF EXCAVATION FOR REINFORCED SOIL FOOTING (RSF) INCLUDING ALL LABOR, MATERIAL, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN THE CONTRACT UNIT PRICE OF "SUBSTRUCTURE FXCAVATION COMMON".
- (4) INCLUDE ALL COSTS ASSOCIATED WITH PROVIDING AND INSTALLING RSF AND GRS BACKFILL MATERIAL INCLUDING ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN THE CONTRACT UNIT PRICE OF "AGGREGATE BASE TYPE A".
- (5) UNIAXIAL OR BIAXIAL GEOSYNTHETIC MAY BE USED. IF UNIAXIAL REINFORCEMENT IS USED PLACE SUCH THAT STRONGEST DIRECTION IS PERPENDICULAR TO THE WALL FACING MATERIAL. INCLUDE ALL COST ASSOCIATED WITH PROVIDING AND INSTALLING GEOSYNTHETIC REINFORCEMENT INCLUDING ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN THE CONTRACT UNIT PRICE OF "GEOTEXTILE REINFORCEMENT"
- PROVIDE FILTER FABRIC IN ACCORDANCE WITH AASHTO M288 THAT MEETS THE REQUIREMENTS FOR BOTH SURFACE DRAINAGE AND SURFACE CONTROL WITH 15% TO 50% OF IN-SITU SOIL PASSING THE NO. 200 SIEVE, CLASS 1 OR 2.
- (7) INCLUDE ALL COSTS ASSOCIATED WITH PROVIDING AND INSTALLING THE ABUTMENT AND WING WALL FACING MARTIAL, SOLID CONCRETE MASONERY UNITS (CMU) AND POLYSTYRENE BOARD INCLUDING ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN THE CONTRACT UNIT PRICE OF "INSTALLATION OF BRIDGE", PAID FOR BY THE SQUARE FOOT. ABUTMENT AND WING WALL FACING MATERIAL OPTIONS INCLUDE, BUT ARE NOT LIMITED TO: SEGMENTAL RETAINING WALL (FARW) UNITS, CMU, PRECAST CONCRETE BLOCKS, STEEL PILING OR ANY CONTRACTOR PROPOSED. PROPRIETARY PRODUCT MEETING THE REQUIREMENTS AND SPECIFICATIONS INCLUDED IN THE PLANS OR REQUIRED FOR USE IN THIS ENVIRONMENT. SUBMIT THE PROPOSED WALL FACING MATERIALS OR PRODUCTS TO ODOT BRIDGE DIVISION FOR FINAL APPROVAL, ALLOWING A MINIMUM OF FOUR (4) WEEKS FOR REVIEW. FOR THE PURPOSE OF ILLUSTRATING THE ABUTMENTS IN THE PLANS, PRECAST CONCRETE BLOCKS WITH DIMENSIONS 8" X 8" X 16" ARE SHOWN, THE ACTUAL SIZE OF THE WALL FACING MATERIAL UNITS WILL VARY BASED ON THE MATERIAL OR PRODUCT SELECTED BY THE CONTRACTOR. THE PLAN DETAILS ARE ONLY FOR ILLUSTRATION AND NOT INTEDED TO IMPLY A PRODUCT REQUIREMENT. SEE THE NOTES REGARDING GRS ABUTMENT MATERIALS' FOR FURTHER INFORMATION.
- (8) INCLUDES REMOVAL OF THE EXISTING BRIDGE IN ITS ENTIRETY.

  a. ALL STEEL TO BE SALVAGED AND STORED ON SITE TO BY REMOVED BY COUNTY FORCES.

  b. EXISTING CONCRETE / MASONRY ABUTMENTS MAY BE BROKEN UP AND USED AS CHANNEL
  - ARMOR PLATING.

    ALL OTHER EXISTING ITEMS TO BE DISPOSED OF OFF SITE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS.
- (9) GUARDRAIL TO BE BOLTED (NOT WELDED) TO POSTS.
- (10) INCLUDES SIX (6) GUARDRAIL DELINEATORS.
- (11) INCLUDES FURNISHING RAIL, PAINTED POST, HARDWARE, AND FOUR (4) DELINEATORS.
- (12) INCLUDES FURNISHING ANCHOR UNIT (TYPE II), HARDWARE, AND DELINEATOR.
- (13) INCLUDES COST TO FORM / CORE A 2-INCH DIA. IN EACH BAY OF THE DECK AT THE HIGH END OF THE BRIDGE.
- (14) IF SRW BLOCKS ARE USED REMOVE THE PROTRUDING "TOUNGUE" ON THE TOP OF THE BLOCK, ON THE TOP ROW, DIRECTLY UNDER THE BEAM LINES.

	PAY QUANTITIES			
BR 40 - GRS	Abutment 35' I-Beam Span w/ Concrete Deck			
ITEM NO.	DESCRIPTION		UNITS	QUANTITY
202(A) 221	UNCLASSIFIED EXCAVATION	(2)	CY	1100.00
303(A) 120	AGGREGATE BASE TYPE A	(2)	CY	700.00
326(A) 120	GEOTEXTILE REINFORCEMENT	(1)(5)	SY	3000.00
501(B) 130	SUBSTRUCTURE EXCAVATION COMMON	(2)(3)	CY	126.00
506(A) 723	STRUCTURAL STEEL A36		LB	6491.00
509(A) 132	CLASS AA CONC.	(2)(13)	CY	33.00
511(A) 133	REINFORCING STEEL	(2)	LB	4668.00
542 910	(PL)INSTALLATION OF BRIDGE ITEMS	(2)(7)(14)	SF	1960.00
601(B) <b>1</b> 23	TYPE 1-A PLAIN RIPRAP (24")		TON	200.00
601(I) 170	FILTER FABRIC (RIPRAP)	(6)	SY	80.00
619(B) 139	REMOVAL OF EXISTING BRIDGE	(8)	LSUM	1.00
SP 670	24 GA. TENSILE FORM		SF	1215.00
SP	BEAM GUARD RAIL ON THE BRIDGE	(9)(10)	LF	100.00
SP	PAINT BEAMS		LSUM	1.00
SP	CONSTRUCTION TESTING		LSUM	1.00

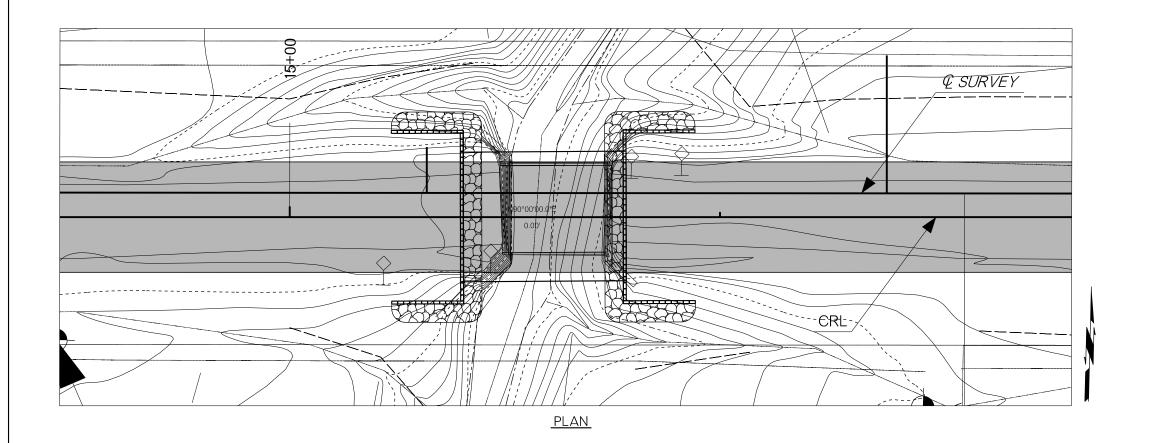
	PAY QUANTITIES								
FURNISHED E	FURNISHED BY CONTRACTOR - INSTALLED BY COUNTY FORCES								
ITEM NO.	DESCRIPTION		UNITS	QUANTITY					
623(A)	GUARDRAIL W-BEAM SINGLE	(11)	LF	200.00					
623(F)	GUARDRAIL W-BEAM END ANCHOR (TYPE B)	(12)	EA	4.00					

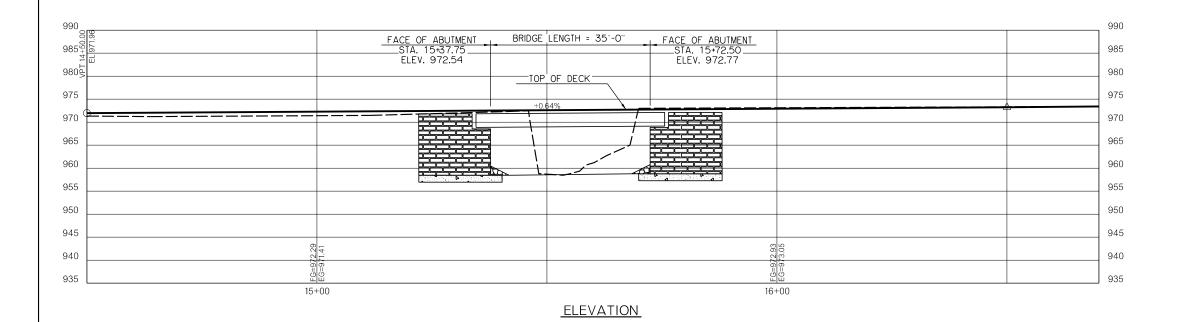
	PAY QUANTITIES		
ROADWAY B	Y COUNTY FORCES		
ITEM NO.	DESCRIPTION	UNITS	QUANTITY
201(A) 0102	CLEARING AND GRUBBING	LSUM	1.0
202(H) 0185	EARTHWORK	LSUM	1.0
221(C) 2801	TEMPORARY SILT FENCE	LF	1300.0
221(F) 0100	TEMPORARY SILT DIKE	LF	100.0
230(A) 2806	SOLID SLAB SODDING	SY	1500.0
233(A) 2817	VEGETATIVE MULCHING	AC	0.6
402(E) 0225	TRAFFIC BOUND SURFACE COURSE TYPE E	TON	363.0
SP	GUARDRAIL W-BEAM SINGLE	LF	200.0
SP	GUARD RAIL ANCHOR UNIT (TYPE II)	EA	4.0
SP	PROVIDE STEEL BEAMS ON SITE	LSUM	1.0

LINCOLN COUNT

SUMMARY OF PAY
QUANTITIES

I-BEAM BRIDGE 40 SHEET NO. 03





# DESIGN DATA

CLASS AA CONCRETE f'c = 4 KSIREINFORCING STEEL fy = 60 KSISTRUCTURAL STEEL (GRADE 36) Fy = 36 KSI

INVENTORY RATING: HS 57.7 OPERATING RATING: HS 96.1

LOADING = HS 20-44 DESIGN: 16 th EDITION AASHTO AND CURRENT AWS SPECIFICATIONS

HYDRAULIC DATA	- BRIDGE "A"								
DRAINAGE AREA = 0.97 SQ. MI. CONTROLLED AREA = X.XX SQ. MI. EFFECTIVE AREA = X.XX SQ. MI.									
$Q_2 = 276 \text{ CFS}$	$Q_{50} = 1360 \text{ CFS}$								
$V_2 = 2.38 \text{ FPS}$	$V_{50} = 4.65 \text{ FPS}$								
$CHW_2 = 964.11 \text{ FT}$	$CHW_{50} = 968.81 \text{ FT}$								
Q5 = 513 CFS	Q <sub>100</sub> = 1600 CFS								
V5 = 3.14 FPS	V <sub>100</sub> = 5.11 FPS								
CHW5 = 965.26 FT	CHW <sub>100</sub> = 969.28 FT								
$Q_{10} = 715$ CFS	QOT= 2150 CFS								
$V_{10} = 3.69$ FPS	VOT= 5.19 FPS								
$CHW_{10} = 965.93$ FT	CHWOT= 971.37 FT								
$Q_{25} = 1030 \text{ CFS}$ $V_{25} = 4.3 \text{ FPS}$ $CHW_{25} = 966.94 \text{ FT}$	V500 = 4.55 FPS								

# LINCOLN COUNTY BRIDGE 41-40 SUPERSTRUCTURE A36 STEEL

NO.	LENGTH	TOTAL WEIGHT						
	(FT.)	(LBS)						
2	44'-10"	611						
2	27'	826						
20	2'-2 3/4"	513						
	440.00	2156						
22	5'-5"	2,385						
	TOTAL	6491						
AL	QUANTITY							
		100 L.F.						
		1215 S.F.						
		33						
#4 Bars	2482 L.F.	1658 LBS						
#5 Bars	2880 L.F.	3010 LBS						
5/8" Dia. x 4" Welded Studs 134 Studs								
	2 2 20 22 AL #4 Bars #5 Bars	(FT.)  2 44'-10"  2 27'  20 2'-23/4"  440.00  22 5'-5"  TOTAL  AL QUAN  #4 Bars 2482 L.F. #5 Bars 2880 L.F.						

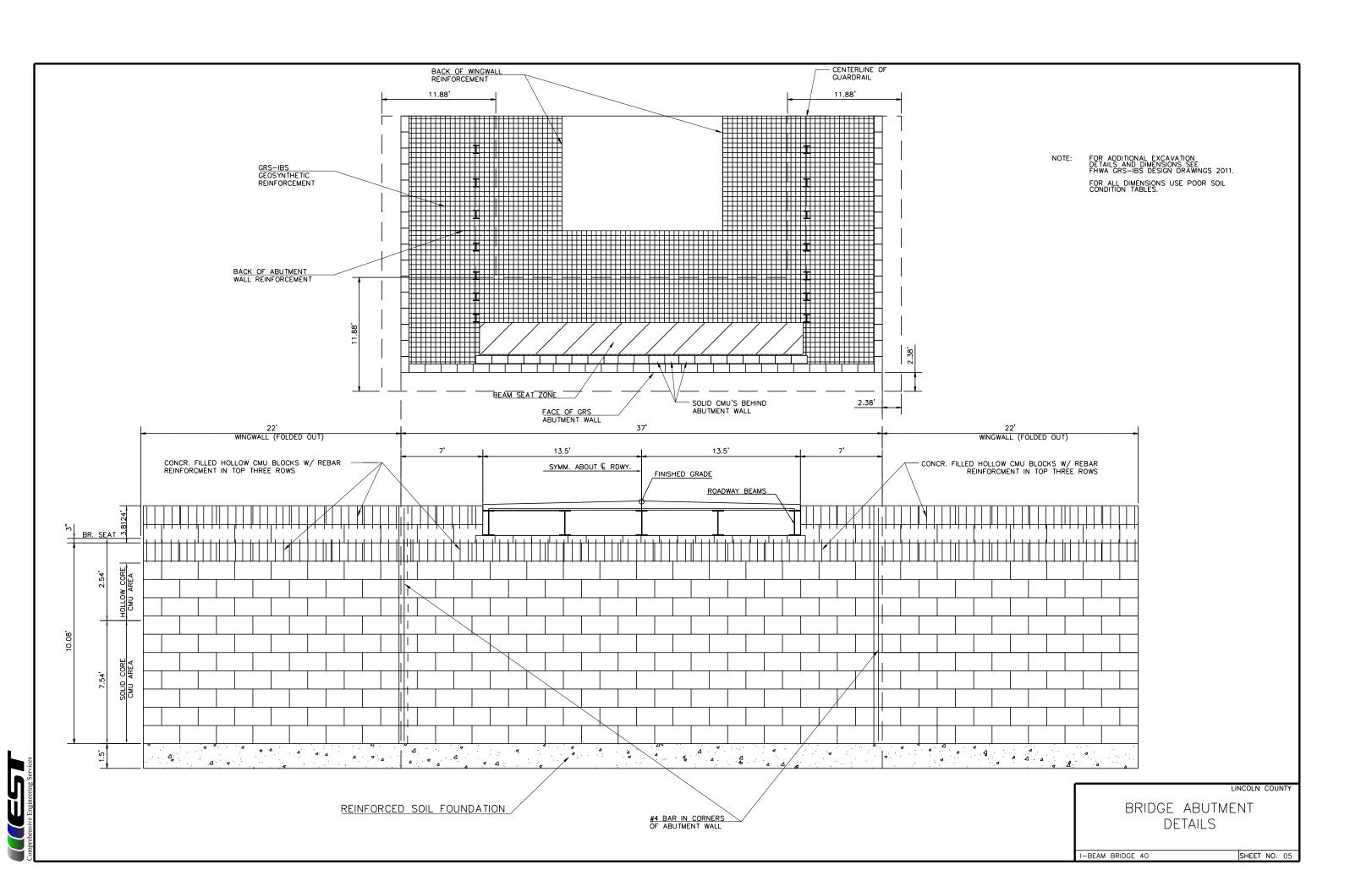
BRIDGE 'A'
CONST. 35'-0" STEEL BEAM BRIDGE
W/ GRS-IBS ABUTMENTS W/ 26'-0" CL. RDY

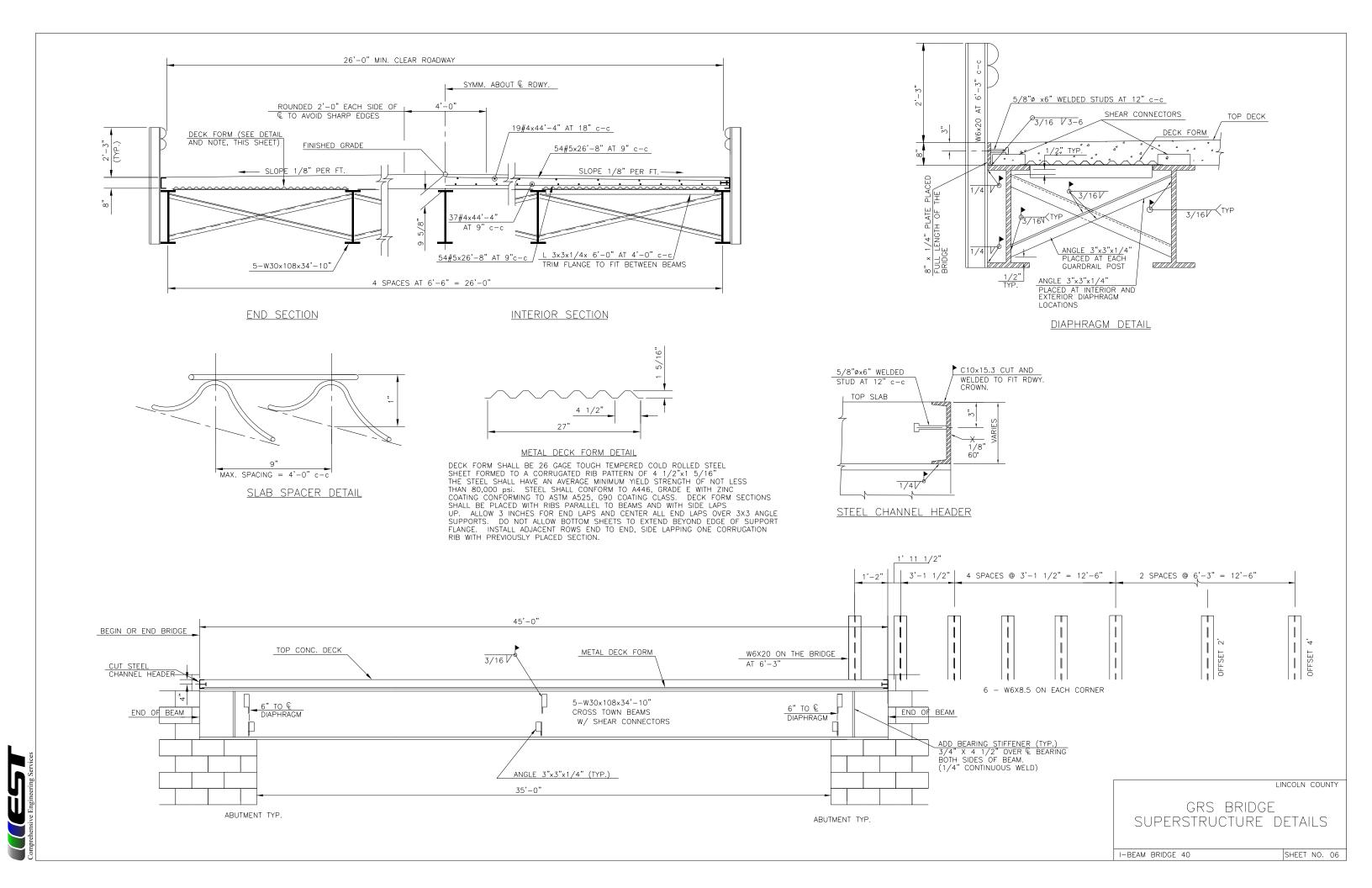
LINCOLN COUNT

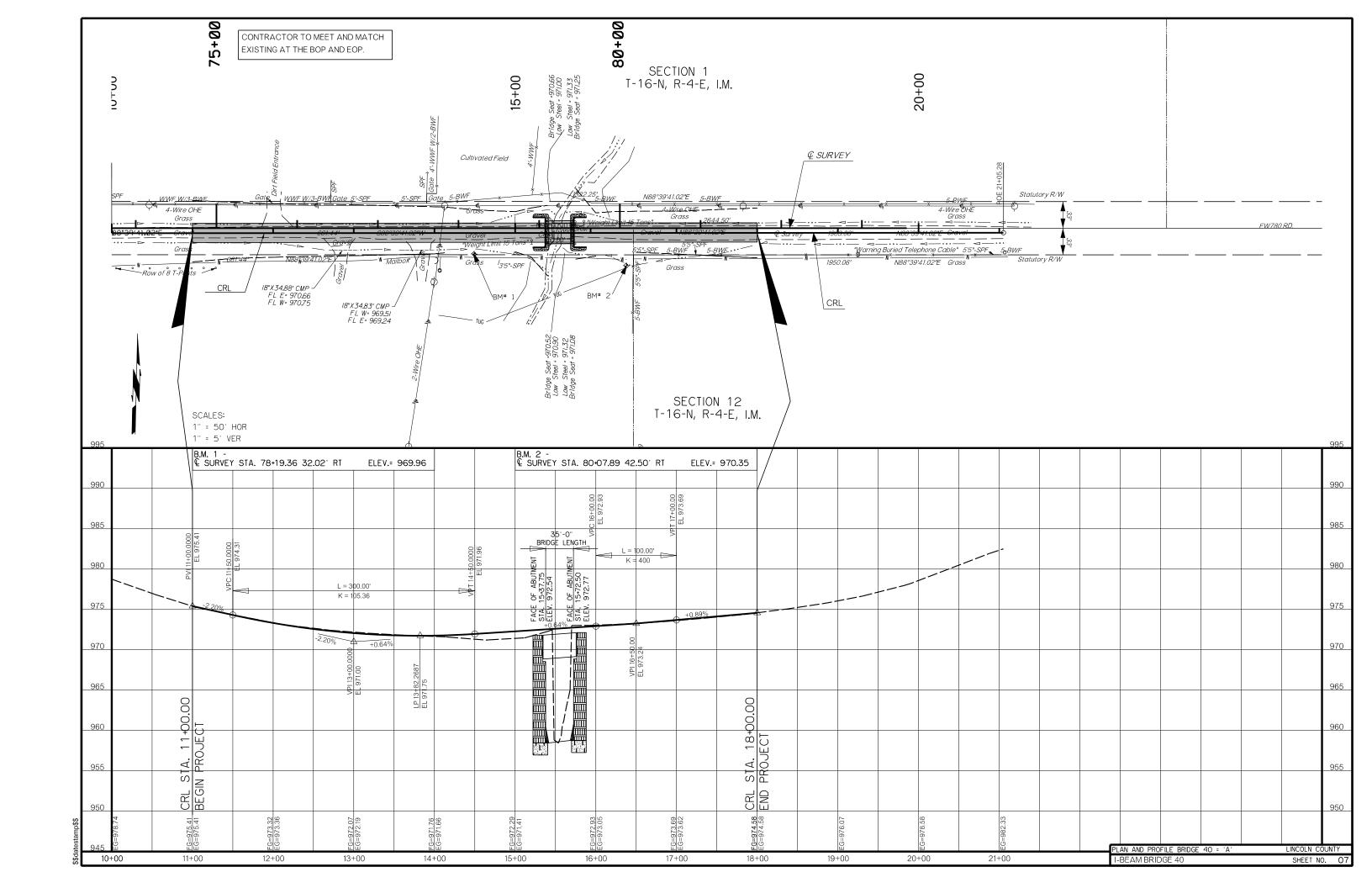
# GENERAL PLAN AND ELEVATION BRIDGE 'A'

SINGLE SPAN (35') STEEL BEAM BRIDGE 26'-0" CLEAR ROADWAY

I-BEAM BRIDGE 40 SHEET NO. 04







# OF IRANGO PARTIES

# **GRS-IBS**DESIGN DRAWINGS

2011

#### INDEX TO SHEETS

- A. COVER SHEET AND NOTES
- **B. QUANTITIES & DESIGN DIMENSIONS**
- C. PLAN AND ELEVATION FACING BLOCK SCHEDULE
- D. GRS-IBS ABUTMENT DETAILS

## GENERAL NOTES

PURPOSE: These example plan Sheets A through D were prepared to illustrate the typical contents of a set of drawings necessary for a GRS-IBS project. Presented in these plans are the assumptions for the bridge and GRS-IBS systems with typical wall heights (H) ranging from 10 to 24 feet. Two conditions were prepared for the quantity estimate Sheet B: "poor soil conditions" and "favorable soil conditions". INTENDED USE: These plans are not associated with a specific project. All dimensions and properties should be confirmed and/or revised by the Engineer of Record prior to use. Project specifications should be prepared to supplement this plan set.

### **DESIGN**

DESIGN LOADS AND SOIL PROPERTIES

Combined load: Superstructure (qLL + qB) 2 TSF maximum (service load, allowable stress design). Roadway live load surcharge: 250 psf uniform vertical

Road Base unit weight = 140 pcf, thickness = 34-inches

"Poor" Soil Conditions:

Retained backfill: Unit weight= 125 pcf, friction angle= 34°, cohesion = 0 psf, (Cohesion  $\geq$  200 psf assumed for temporary back slope cut conditions during construction.)  $d_{max} \geq 1.0$  inches

Reinforced fill: Unit weight=115 pcf, friction angle = 38°, cohesion = 0 psf RSF backfill: Unit weight = 140 pcf, friction angle = 38°, cohesion = 0 psf Foundation soil: Unit weight = 125 pcf, friction angle = 30°, cohesion = 0 psf

"Favorable" Soil Conditions:

Retained backfill: Unit weight = 125 pcf, friction angle = 40°, cohesion = 100 psf  $d_{max} > 0.5$ -inches

Foundation soil: Unit weight = 125 pcf, friction angle =  $40^{\circ}$ , cohesion = 100 psf Reinforced fill: Unit weight = 120 pcf, friction angle =  $42^{\circ}$ , cohesion = 0 psf RSF backfill: Unit weight = 120 pcf, friction angle =  $42^{\circ}$ , cohesion = 0 psf

## DESIGN SPECIFICATIONS

- 1. Geosynthetic Reinforced Soil Integrated Bridge System Interim Implementation Guide, FHWA-HRT-11-026, January 2011.
- 2. Design methods follow the ASD design methods presented in Chapter 4 of the reference Manual. No seismic design assumed.
- 3. Conduct a subsurface investigation in accordance with "Soils and Foundations", FHWA-NHI-06-088 (2006) and "Subsurface Investigations", FHWA-NHI-01-031, (2006).
- 4. Design factor of safety against sliding is  $\geq 1.5$ ; Factor of safety against bearing failure is  $\geq 2.5$
- 5. A global stability analysis must be performed for each site. Factor of safety against global failure is to be  $\geq 1.5$ .
- 6. Performance criteria: tolerable vertical strain = 0.5% of wall height (H): tolerable lateral strain = 1.0% of b and  $a_b$  (bearing width and setback)

- 7. Settlement below the RSF is assumed to be negligible. No differential settlement between abutments is assumed.
- 8. Sliding checks were conducted at the top and bottom of the RSF to meet the minimum factors of safety in the reference manual.
- 9. Road base thickness ( $h_{rb}$ ) assumes a 32-inch structure and 2-inch pavement thickness.

#### CONSTRUCTION SPECIFICATIONS

- 1. Site Layout/Survey: Construct the base of the GRS abutment and wingwalls within 1.0 inch of the staked elevations. Construct the external GRS abutment and wingwalls to within  $\pm 0.5$  inches of the surveyed stake dimensions.
- 2. Excavation: Comply with Occupational Safety and Health Administration (OSHA)
- 3. Compaction: Compact backfill to a minimum of 95 percent of the maximum dry density according to AASHTO-T-99 and ± 2 percent optimum moisture content In the bearing reinforcement zone, compact to 100 percent of the maximum dry density according to AASHTO-T-99. Only hand-operated compaction equipment is allowed within 3-feet of the wall face. Reinforcement extends directly beneath each layer of CMU blocks, covering > 85% of the full width of the block to the front face of the wall.
- 4. Geosynthetic Reinforcement Placement: Pull the geosynthetic taught to remove any wrinkles and lay flat prior to placing and compacting the backfill material. Splices should be staggered at least 24-inches apart and splices are not allowed in the bearing reinforcement zone. No equipment is allowed directly on the geosynthetic. Place a minimum 6-inch layer of granular fill prior to operating only rubber-tired equipment over the geosynthetic at speeds less than 5 miles per hour with no sudden braking or sharp turning.
- 5. RSF Construction: The RSF should be encapsulated in geotextile reinforcement on all sides with minimum overlaps of 3.0 feet to prevent water infiltration. Wrapped corners need to be tight without exposed soil. Compact backfill material in lifts less than 6-inches in compacted height. Grade and level the top of the RSF prior to final encapsulation, as this will serve as the leveling pad for the CMU blocks of the GRS abutment.
- 6. GRS Wall Face Alignment: Check for level alignment of the CMU block row at least every other layer of the GRS abutment. Correct any alignment deviations greater than 0.25 inches.
- 7. Beam Seat Placement: Generally, the thickness of the beam seat is approximately 8 to 12 inches and consists of a minimum of two 4-inch lifts of wrapped-face GRS. Place precut 4-inch thick foam board on the top of the bearing bed reinforcement butt against the back face of the CMU block. Set half-height or full height (depending on wall height and required clear space) solid CMU blocks on top of the foam board. Wrap two approximately 4-inch lifts across the beam seat. Before folding the final wrap, it may be necessary to grade the surface aggregate of the beam seat slightly high, to about 0.5 inches, to aid in seating the superstructure and to maximize contact with the bearing area.

- 8. Superstructure Placement: The crane used for the placement of the superstructure can be positioned on the GRS abutment provided the outrigger pads are sized for less than 4,000 psf near the face of the abutment wall. Greater loads could be supported with increasing distance from the abutment face if checked by the Engineer of Record. An additional layout of geosynthetic reinforcement can be placed between the beam seat and the concrete or steel beams to provide additional protection of the beam seat. Set beams square and level without dragging across the beam seat surface.
- 9. Integrated Approach Placement: Following the placement of the superstructure, geotextile reinforcement layers are placed along the back of the superstructure, built in maximum lift heights of 6-inches (maximum vertical spacing of reinforcement ≤ 6-inches). The top of the final wrap should be approximately 2-inches below the top of the superstructure to allow at least 2-inches of aggregate base cover over the geosynthetic to protect it from hot mix asphalt.
  REINFORCING STEEL

Provide reinforcing steel conforming to ASTM A615, GR. 60.

### CMU BLOCK

In colder climates, freeze-thaw test (ASTM C1262-10) should be concluded to assess the durability of the CMU and ensure it follows the standard specification (ASTM C1372). Additives can be used to reduce efflorescence at the face of the blocks if they are at locations subject to de-icing chemicals.

Compresive strength = 4,000 psi minimum

Water absorption limit = 5 %

 $H_{block} = 7\frac{1}{8}$ "  $L_{block} = 15\frac{1}{8}$ "  $L_{block} = 7\frac{1}{8}$ "

Note: In many construction applications CMU blocks are placed with a  $\frac{3}{6}$ " mortar joint to create an in place nominal dimension of  $8" \times 8" \times 16"$ .

# REINFORCED BACKFILL GRADATION

Reinforced Backfill Gradation = See Geosynthetic Reinforced Soil Integrated Bridge System Interim Implementation Guide, Table 1 or Table 2. Consider GRS CMU minimal dimensions to be the same.

# GEOSYNTHETIC REINFORCEMENT TENSILE PROPERTIES

Required ultimate tensile strength = 4,800 lb/ft by (ASTM D 4595 (geotextiles) or ASTM D 6637 (geogrids))
Tensile strength at 2% strain = 1,370 lb/ft

#### POLYSTYRENE FOAM BOARD

Provide polystyrene foam board conforming to AASHTO M230, type VI.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION WESTERN FEDERAL LANDS HIGHWAY DIVISION

> GRS-IBS COVER SHEET

5	NO. I	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
	03	3/25/11		Rev. 0		04/04/11		Rev. 1	FHWA	CTUTTLE	R. BARROWS, B. COLLINS, M. DODSON, M. ELIAS	NTS	M. ADAMS	1 of 4	04/2011	
٦	03	3/29/11							TIIWA	C. TOTTLE	A. ALZAMORA, J. NICKS	1113	1117.07.110		,	

		GRS-	IBS Poor S	Soil Con	dition Qu	antites Per	Abutmer	nt <sup>1/</sup>		
HEIGHT (H) (FT)	ROAD BASE h <sub>rb</sub> THICKNESS (IN)	GEOSYNTHETIC REINFROCEMENT (SQYD)	CMU BLOCK HOLLOW (EA)	CMU BLOCK SOLID (EAC H)	#4 REBAR (FT)	GRS BACKFILL (CUYD)	RSF FILL (CUYD)	FOAM BOARD (SQFT)	ROAD BASE AGGREGATE (CUYD)	CONCRETE BLOCK WALL FILL (CUYD)
10.42	34	1200	710	349	652	287	<i>52</i>	18	54	1.4
12.32	34	1700	950	365	698-	399	73	18	<del>63</del>	1.5
14.31	34	2100	1165	<del>- 373</del> -	<del>721</del>	509	94	18	68	7.6
16.22	34	2700	1455	389	766	655	<del>- 123</del>	18	77	1.7
18.21	34	3200	1700	397	789	793	154	-36	82	1.7
20.12	34	4000	2030-	413	835	973	187	36	92	1.8
22.1	34	4600	2305	421	858-	1139	-220	36	96	1.9
24.01	34	5600		437	904 -	1354	267	36	106	2

	GRS-IBS ABBUTMENT Favorable Soil Condition Quantities Per Abutment 1/													
HEIGHT (H) (FEET)	ROAD BASE h <sub>rb</sub> THICKNESS (IN)	GEOSYNTHETIC REINFROCEMENT (SQYD)	CMU BLOCK HOLLOW (EACH)	CMU BLOCK SOLID (EACH)	#4 REBAR (FEET)	GRS BACKFILL (CUYD)	RSF FILL (CUYD)	FOAM BOARD (SQFT)	ROAD BASE AGGREGATE (CUYD)	CONCRETE BLOCK WALL FILL (CUYD)				
10.42	34	1000	710	349	652	176	24	18	54	1.4				
12.32	34	1400	950	365	698	242 `	26	18	63	1.5				
14.31	34	1700	1165	373	721	305	27	18	68	1.6				
16.22	34	2200	1455	389	766	394	29	<b>18</b> ,	<i>77</i>	1.7				
18.21	34	2700	1700	397	789	483	35	36	<i>82</i>	1.7				
20.12	34	3400	2030	413	835	606	43	36	92	1.8				
22.1	34	4000	2305	421	858	715	50	36	96	1.9				
24.01	34	4800	3280	437	904	865	60	36	106	2				

FΟ	07	NC	TE	S:

- If the estimated materials quantities correspond to the dimensions on the accompanying plan sheets. Deviation from the dimensions on the plan sheets will void the quantities.
- 2 Foam board thickness is 4-inches (typ.).
- 3 Wingwall length = B total + H + 3-feet.
- 4) CMU block assumptions: solid blocks at the base of the GRS abutment from estimated scour elevation to 100-year flood event elevation (5-feet assumed here): solid blocks in setback location to beam seat (1-row assumed): hollow blocks for remaining wall height and guardrail height: concrete-filled blocks assumed 3 rows deep below bearing pad and at the top of the wall of guardwall and at all corners: wet cast coping at the top row of exposed CMU at abutment wall and wingwall: flush concrete fill in the CMU's at the top of the abutment wall under the beam seat below the clear zone. See Sheet C and D for illustrations of these details.
- Maximum vertical spacing of reinforcement = height of 1 CMU block (H<sub>block</sub>) in reinforced backfill zone. Maximum vertical spacing of reinforcement ≤ 6-inches in bearing bed zone and integrated approach.
- ☑ Design clear space (d<sub>e</sub>) rounded up to the nearest 1.0 inch.

	GRS-IBS Poor Soil Condition DESIGN DIMENSIONS													
WALL HEIGHT (H)	WINGWALL LENGTH, L <sub>ww</sub>	<u>Z</u> / d <sub>e</sub>	a <sub>b</sub>	b	b <sub>r</sub>	B <sub>total</sub>	В	B <sub>RSF</sub>	D <sub>RSF</sub>	X <sub>RSF</sub>	ABUT WIDTH	WINGWAL L HEIGHT		
(FT)	(FT)	(IN)	(IN)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)		
10.42	15.63	3	7.6	2.5	3.83	9.5	8.86	11.88	2.38	2.38	37.76	14.00		
12.32	18.23	-3-	<del>7.6</del>	2.5	-3.83	11.0	10.36	13.75	2.75	2.75	37.76	15.89		
14.31	<del>1</del> 9. <del>5</del> 3 —	4	7:6	2.5	-3.83	12.5	11.86	15.63	3.13	3.13	<del>37:76</del>	17.79		
16.22	22.14	4	<del>-7.6</del> -	<del>-2.5</del> -	<del>- 3.83-</del>	14.0	13.36	17.50	<del>- 3.5</del> 0	<del>-3.5</del> 0-	37.76	<del>10.70</del>		
18.21	23.44	- 5-	7.6	2,5	3.83	15.5	14.86	19.38	4.00	3.88	37.76	21.60		
20.11	26.04	- 5	7:6	2.5	3.83	17.0	16.36	21.25	4.25	4.25	37.76	23.51		
22.10	27.34	6	<del>7:6</del> -	2.5	<del>3.8</del> 3 -	18.5	<del>-17.8</del> 6 -	23.13	<del>4:6</del> 3 -	4.63	-37.76	25.42		
24.01	<del>2</del> 9.95	-6-	7:6	<del>-2.5</del> -	<del>-3.8</del> 3-	<del>-2</del> 0.0 -	<del>-1</del> 9. <del>3</del> 6 -	<del>-2</del> 5. <i>00</i> -	<del>-5</del> .00-	- 5.00	37.76	27.83		

	GRS-IBS Favorable Soil Condition DESIGN DIMENSIONS													
WALL HEIGHT (H)	WINGWALL LENGTH, L <sub>ww</sub>	7/ d <sub>e</sub>	a <sub>b</sub>	Ь	Ь,	B <sub>total</sub>	В	B <sub>RSF</sub>	D <sub>RSE</sub>	X <sub>RSF</sub>	ABUT WIDTH	WINGWALL HEIGHT		
(FT)	(FT)	(IN)	(IN)	(FT)	YFI)	(FT)	(EP)	(FT)	(FT)	(FT)	(FT)	(FT)		
10.42	15.63	3	7.6	2.5	3.83	>60	5.36	7.50	1.50	1.50	37.76	14.00		
12.32	18.23	3	7.6	2.5	3.83	6.0	5.36	7.50	1.50	1.50	37.76	15.89		
14.31	19.53	4	7.6	25	3.83	6.0	5.36	7.50	1.50	1.50	37.76	17.79		
16.22	22.14	4	7.6	2.5	3.83	6.0	5.36	7.50	4.50	1.50	37.76	19.70		
18.21	23.44	_5	7.6	2.5	3.83	6.5	5.86	8.13	1.63	1.63	37.76	21.60		
20.11	26.04	5	7.6	2.5	3.83	7.0	6.36	8.75	1.75	1.75	37.76	23.51		
22.10	27.34	6	7.6	2.5	3.83	7.5	6.86	9.38	1.88	1.88	37.76	25.42		
24.01	29.95	6	7.6	2.5	3.83	8.0	7.36	10.00	2.00	2.00	37.76	27.83		

#### ABREVIATIONS:

- a<sub>b</sub> = Set back distance between back of facing element and beam seat
- B = Base length of reinforcement not including the wall face
- b = Bearing width for bridge, beam seat

 $B_b = Width of the bridge$ 

 $b_{block} = Width of CMU$ 

 $b_r$  = Length of bearing bed reinforcement

 $B_{RSF} = Width of RSF$ 

 $B_{total}$ = Total width at base of GRS abutment including the wall facing

CMU = Concrete masonry unit

 $d_{\rm e} = \ {\it Clear space from top of wall to bottom of superstructure.}$ 

d<sub>max</sub>= Maximum partical diameter in reinforced

 $D_{RSF} = Depth of RSF below bottom of wall elevation$ 

GRS = Geosynthetic Reinforced Soil

H = Wall height measured from top of RSF to top of beam seat

 $H_{block} = Height of CMU$ 

 $h_{rb}$  = Height of road base (equals height of super structure and pavement thickness)

IBS = Integrated Bridge System

L = Length of geosynthetic reinforcement

 $L_{abut}$ = Abutment width

 $L_{block} = Length of CMU$ 

 $L_{ww} = Wingwall length.$ 

RSF = Reinforced soil foundation

 $X_{RSF}$  = Length of RSF in front of the abutment wall face

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION WESTERN FEDERAL LANDS HIGHWAY DIVISION

GRS-IBS
DESIGN DIMENSION
QUANTITIES

NO. DATE B	BY REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
03/25/11	Rev. 0		<i>i</i>			FHWA	C. TUTTLE	R. BARROWS, B. COLLINS, M. DODSON, M. ELIAS A. ALZAMORA, J. NICKS	NTS	M. ADAMS	2 of 4	04/2011	

