BRIDGE NOTES

SPECIFICATIONS:
COMPLY WITH THE REQUIREMENTS OF THE 2009 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EXCEPT AS MODIFIED BY THE PLANS.

CONCRETE INTERMEDIATE DIAPHRAGMS:
ONCE THE CONCRETE HAS BEEN PLACED FOR THE CONCRETE INTERMEDIATE DIAPHRAGMS, WAIT A MINIMUM OF 24 HOURS BEFORE REMOVING THE SIDE FORMS. DO NOT REMOVE THE BOTTOM FORM FOR A MINIMUM OF 3 DAYS, OR AT THE DISCRETION OF THE ENGINEER. THIS TIME CAN BE SHORTENED IF THE CONCRETE HAS ATTAINED 80% OF THE SPECIFIED COMPRESSIVE STRENGTH. DO NOT PLACE THE CONCRETE FOR THE DECK SLAB OR APPLY OTHER MASSIVE LOADS TO THE BEAMS OR DIAPHRAGMS UNTIL THE CONCRETE IN THE DIAPHRAGMS HAS BEEN IN PLACE FOR A MINIMUM OF 10 DAYS, OR AT THE DISCRETION OF THE ENGINEER. THIS TIME CAN BE SHORTENED IF THE CONCRETE HAS ATTAINED 80% OF THE SPECIFIED COMPRESSIVE STRENGTH.

RIPRAP:
A 18" THICK LAYER OF TYPE I-A PLAIN RIPRAP WITH A 6" THICK LAYER OF TYPE I-A FILTER BLANKET SHALL BE PLACED AT THE ABUTMENTS AS SHOWN IN THE PLANS. THE FILTER BLANKET SHALL BE PLACED IN ONE LAYER.

PILE DRIVING EQUIPMENT:
USE A PILE DRIVING HAMMER OF THE SIZE AND TYPE CAPABLE OF CONSISTENTLY DELIVERING THE EFFECTIVE DYNAMIC ENERGY SUFFICIENT TO DRIVE THE PILES TO THE REQUIRED TIP ELEVATION AND TO ACHIEVE THE REQUIRED PILE CAPACITY WITHOUT EXCEEDING THE LIMITATIONS SET ON THE ALLOWABLE DRIVING STRESSES IN ACCORDANCE WITH SECTION 514.03(A)2.

REMOVAL OF EXISTING BRIDGE STRUCTURE:
ITEM "REMOVAL OF EXISTING BRIDGE STRUCTURE" CONSISTS OF REMOVAL AND DISPOSAL OF A 51'-I BEAM SPAN x 24'...AT STA. 109+40 AND A 18' I-BEAM SPAN x 24'...AT STA. 120+30.00. THE CONTRACTOR SHALL SALVAGE THE BRIDGE RAILING, STEEL BEAMS AND STOCKPILE ON THE R/W TO BECOME PROPERTY OF THE COUNTY. THE REMOVAL SHALL BE IN ACCORDANCE WITH SECTION 619.04(B)2 OF THE SPECIFICATIONS AND IN A MANNER APPROVED BY THE ENGINEER. THE STRUCTURE AND MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

BRIDGE PAY QUANTITY NOTES
(1) ALL PILES MAY BE EQUIPPED WITH CAST STEEL-DRIVING TIPS. ALL COSTS FOR FURNISHING AND INSTALLING CAST STEEL-DRIVING TIPS TO BE INCLUDED IN OTHER ITEMS OF WORK.

(2) 501(G) CLSM BACKFILL SHALL REPLACE GRANNULAR BACKFILL ON STANDARD CB26..32-C-SKO-ABUT-MISC-01E. INCLUDES 12. C.Y. TO EXTEND CLSM TO THE TOP OF SUBGRADE.

(R-1)   PAYMENT FOR THIS ITEM WILL BE BASED ON THE PLAN QUANTITIES ONLY. SEE SECTION 109.01(B) OF THE STANDARD SPECIFICATION.

(R-2)   THE CONTRACTOR SHALL PROVIDE STRUCTURAL STEEL FOR THE STEEL PILING CONFORMING TO AASHTO M270, GRADE 50.

0200 — PAY QUANTITIES BRIDGE A

Item		Description		Units	Quantity
501(B)	1307	Substructure Excavation Common	(R-1)	C.Y.	200.00
501(G)	6309	CLSM Backfill	(R-1)(2)	C.Y.	92.00
503(A)	1311	Prestressed Concrete Beams (Type II)	(R-1)	L.F.	357.34
503(A)	1312	Prestressed Concrete Beams (Type III)	(R-1)	L.F.	358.67
504(B)	1305	Saw-Cut Grooving	(R-1)	S.Y.	564.80
504(C)	6250	Sealed Expansion Joint		L.F.	70.34
504(D)	6239	Concrete Rails (TR3)	(R-1)	L.F.	418.80
506(A)	1322	Structural Steel	(R-1)(R-2)	LB.	1110.00
507(A)	6172	Weathering Steel Fixed Bearing Assembly		E.A.	12.00
507(B)	6176	Weathering Steel Exp. Bearing Assembly		E.A.	12.00
509(A)	1326	Class AA Concrete	(R-1)	C.Y.	175.00
509(B)	1328	Class A Concrete	(R-1)	C.Y.	124.20
511(A)	1332	Reinforcing Steel		LB.	56480.00
514(A)	6010	Piles, Furnished (HP 10x42)	(1)	L.F.	130.00
514(A)	6011	Piles, Furnished (HP 12x53)	(1)	L.F.	295.00
514(B)	6292	Piles, Driven (HP 10x42)		L.F.	130.00
514(B)	6294	Piles, Driven (HP 12x53)		L.F.	295.00
514(L)	6220	Pile Splice, H-Pile (Non-Biddable)		E.A.	1.00
516(A)	6094	Drilled Shafts 48" Diameter		L.F.	106.00
516(C)	6200	Crosshole Sonic Logging		E.A.	1.00
601(B)	1353	Type 1-A Plain RipRap		Ton	1160.00
601(C)	1355	Type 1-A Filter Blanket		Ton	387.00
613(H)	6204	6" Perforated Pipe Underdrain, Round		L.F.	64.00
613(I)	6207	6" Non-Perf. Pipe Underdrain Rnd		L.F.	30.00
619(D)	1397	Removal of Existing Bridge Structure		L.Sum	1.00
623(A)	1418	Beam Guardrail W-Beam Single		L.F.	200.00
623(F)	5686	Guardrail Anchor Unit (Type D-BF)		E.A.	4.00
623(G)	8571	Guardrail End Treatment (GET)		E.A.	4.00

0201 — PAY QUANTITIES BRIDGE B

Item		Description		Units	Quantity
501(B)	1307	Substructure Excavation Common	(R-1)	C.Y.	210.00
501(G)	6309	CLSM Backfill	(R-1)(2)	C.Y.	104.00
503(A)	1312	Prestressed Concrete Beams (Type III)	(R-1)	L.F.	358.67
504(B)	1305	Saw-Cut Grooving	(R-1)	S.Y.	286.80
504(D)	6239	Concrete Rails (TR3)	(R-1)	L.F.	241.20
506(A)	1322	Structural Steel	(R-1)(R-2)	LB.	370.00
507(A)	6172	Weathering Steel Fixed Bearing Assembly		E.A.	4.00
507(B)	6176	Weathering Steel Exp. Bearing Assembly		E.A.	4.00
509(A)	1326	Class AA Concrete	(R-1)	C.Y.	87.80
509(B)	1328	Class A Concrete	(R-1)	C.Y.	76.20
511(A)	1332	Reinforcing Steel		LB.	29090.00
514(A)	6010	Piles, Furnished (HP 10x42)	(1)	L.F.	174.00
514(A)	6011	Piles, Furnished (HP 12x53)	(1)	L.F.	553.00
514(B)	6292	Piles, Driven (HP 10x42)		L.F.	174.00
514(B)	6294	Piles, Driven (HP 12x53)		L.F.	553.00
514(L)	6220	Pile Splice, H-Pile (Non-Biddable)		E.A.	1.00
601(B)	1353	Type 1-A Plain RipRap		Ton	591.00
601(C)	1355	Type 1-A Filter Blanket		Ton	197.00
613(H)	6204	6" Perforated Pipe Underdrain, Round		L.F.	64.00
613(I)	6207	6" Non-Perf. Pipe Underdrain Rnd		L.F.	30.00
619(D)	1397	Removal of Existing Bridge Structure		L.Sum	1.00
623(A)	1418	Beam Guardrail W-Beam Single		L.F.	375.00
623(F)	5686	Guardrail Anchor Unit (Type D-BF)		E.A.	4.00
623(G)	8571	Guardrail End Treatment (GET)		E.A.	4.00

ABUTMENT PILING CAPACITY. BRIDGE A
THE MAXIMUM FACTORED PILE LOAD FOR EACH HP 12X53 PILE IS 68.4 TONS. ALL PILE SHALL BE AASHTO M270 GRADE 50.

THE FOLLOWING FORMULA (GATES EQUATION) SHALL BE USED TO DETERMINE THE AXIAL LOAD RESISTANCE OF THE DRIVEN FOUNDATION PILES:

AXIAL LOAD RESISTANCE = $\phi[(0.875\sqrt{E} \log_{10}(10N))-50]$ TONS

WHERE:
ϕ= RESISTANCE FACTOR OF 0.4
E = ENERGY PRODUCED BY THE HAMMER PER BLOW IN FOOT-POUNDS. FOR GRAVITY AND SINGLE ACTING DIESEL HAMMERS, THE VALUE IS BASED ON THE ACTUAL RAM STROKE OBSERVED IN THE FIELD AND MEASURED IN FEET MULTIPLIED BY THE RAM WEIGHT IN POUNDS.
N= Average NUMBER OF HAMMER BLOWS PER INCH OF PILE PENETRATION FOR THE LAST 10 TO 20 BLOWS DELIVERED TO THE PILE HEAD.
THE ABOVE FORMULA IS ONLY APPLICABLE WHEN:
  THE PILE DRIVING HAMMER HAS A FREE FALL (GRAVITY & SINGLE ACTING HAMMERS ONLY).
  THE HEAD OF THE PILE IS NOT BROOMED, CRUSHED OR OTHERWISE DAMAGED.
  THE PENETRATION IS QUICK AND UNIFORM.
  THERE IS NO APPRECIABLE REBOUND OF THE HAMMER, AND
  A FOLLOWER IS NOT USED.

THE NUMBER OF BLOWS PER INCH OF PILE PENETRATION MAY BE MEASURED EITHER DURING INITIAL DRIVING OR BY RE-DRIVING WITH A WARM HAMMER OPERATED AT FULL ENERGY AFTER A PILE SET PERIOD, AS DETERMINED BY THE ENGINEER.

IF WATER JETS ARE USED IN CONNECTION WITH THE DRIVING, DETERMINE THE AXIAL LOAD RESISTANCE BY THE FORMULA SHOWN ONLY AFTER THE JETS HAVE BEEN WITHDRAWN.

ABUTMENT PILING CAPACITY. BRIDGE B
THE MAXIMUM FACTORED PILE LOAD FOR EACH HP 12X53 PILE IS 71.5 TONS. ALL PILE SHALL BE AASHTO M270 GRADE 50.

THE FOLLOWING FORMULA (GATES EQUATION) SHALL BE USED TO DETERMINE THE AXIAL LOAD RESISTANCE OF THE DRIVEN FOUNDATION PILES:

AXIAL LOAD RESISTANCE = $\phi[(0.875\sqrt{E} \log_{10}(10N))-50]$ TONS

WHERE:
ϕ= RESISTANCE FACTOR OF 0.4
E = ENERGY PRODUCED BY THE HAMMER PER BLOW IN FOOT-POUNDS. FOR GRAVITY AND SINGLE ACTING DIESEL HAMMERS, THE VALUE IS BASED ON THE ACTUAL RAM STROKE OBSERVED IN THE FIELD AND MEASURED IN FEET MULTIPLIED BY THE RAM WEIGHT IN POUNDS.
N= Average NUMBER OF HAMMER BLOWS PER INCH OF PILE PENETRATION FOR THE LAST 10 TO 20 BLOWS DELIVERED TO THE PILE HEAD.
THE ABOVE FORMULA IS ONLY APPLICABLE WHEN:
  THE PILE DRIVING HAMMER HAS A FREE FALL (GRAVITY & SINGLE ACTING HAMMERS ONLY).
  THE HEAD OF THE PILE IS NOT BROOMED, CRUSHED OR OTHERWISE DAMAGED.
  THE PENETRATION IS QUICK AND UNIFORM.
  THERE IS NO APPRECIABLE REBOUND OF THE HAMMER, AND
  A FOLLOWER IS NOT USED.

THE NUMBER OF BLOWS PER INCH OF PILE PENETRATION MAY BE MEASURED EITHER DURING INITIAL DRIVING OR BY RE-DRIVING WITH A WARM HAMMER OPERATED AT FULL ENERGY AFTER A PILE SET PERIOD, AS DETERMINED BY THE ENGINEER.

IF WATER JETS ARE USED IN CONNECTION WITH THE DRIVING, DETERMINE THE AXIAL LOAD RESISTANCE BY THE FORMULA SHOWN ONLY AFTER THE JETS HAVE BEEN WITHDRAWN.