FLOOD PROTECTION PROJECT
BLUE RIVER BASIN
KANSAS CITY, MISSOURI

BLUE RIVER CHANNEL MODIFICATIONS

BRUSH CREEK TO 53RD STREET CHANNEL PLANS

DATE: AUGUST 2008
NOT FOR CONSTRUCTION

W912DQ-08-C-0008
CONTRACT PLANS

US Army Corps of Engineers
Kansas City District
You Matter - We Care

DESIGNER OF RECORD APPROVAL

Work Product: Environmental Enhancement Plans
Submittal Stage: Prefinal Plans
Discipline: Channel
Designer of Record: Thomas James Kimes

Signature:_____
Date: _____

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US Army Corps of Engineers
Kansas City District

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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

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AMPERE	AMP
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ANGLE	L
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CYLINDER	CYL

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DEPARTMENT	DEPT
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DOUBLE	D OR DBL
DOUBLE ACTING	DA
DOUBLE HUNG	DH
DOWN	DN
DOWN SPOUT	DS
DRAIN	DR
DRAWING	DWG
DRESSED & MATCHED	D & M
DRINKING FOUNTAIN	DF
DRINKING WATER DISPENSER	DWD
DRIVE	DR
DROP INLET	DI
DRY BULB	DB
DUCTILE IRON	D.I.
DUMMY CONTROL JOINT	DCJT
DOOR OPERATOR MOTOR	DOM

E

EACH	EA
EACH WAY	EW
EACH FACE	EF
EAST	E
EDGE OF CURB	EOC
EDGE OF PAVEMENT	EP
ELECTRICAL OR ELECTRIC	ELEC
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EXTERIOR	EXT

F

FACING	FCG
FAN COIL UNIT	FC
FAHRENHEIT	F
FAR SIDE	F.S.
FEET OR FINNED TUBE	FT
FEET PER MINUTE	F.P.M.
FLUSH FLR. CLEAN OUT	FFCO
FIGURE	FIG
FINISH	FIN.
FINISH FLOOR	FF
FIRE EXTINGUISHER CABINET	FEC
FIRE HOSE CABINET	FHC
FIRE HYDRANT	FH
FIRE PROOF	FPRF
FIRE PROTECTION	FP
FIXTURE	FIX.
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FLASHING	FLASH.
FLOOR	FLR OR FL
FLOOR DRAIN OR FIRE DAMPER	FD
FLOWLINE	F/L
FLOORING	FLG
FLUORESCENT	FLUOR
FOOT CANDLE	FC
FOOTING	FTG
FOUNDATION	FDN
FRAME	FR
FRESH AIR	FA
FULL SIZE	F.S.
FURRING	FURR'G

G

GAUGE	GA
GALLON	GAL
GALLONS PER MINUTES	GPM
GALVANIZED	GALV
GALVANIZED IRON	GI
GARBAGE DISPOSER	GD
GAS	G
GAS VALVE	GV
GATE VALVE	G.V.
GENERAL	GEN
GLASS	GL
GLAZED WALL TILE	GWT
GOVERNMENT	GOVT.
GRADE	GR
GRAVEL	GRVL
GRATING	GRTG
GROUND CLEANOUT	G.C.O.
GROUND	GND OR GRND
GYPSUM	GYP
GYPSUM WALLBOARD	GWB OR GYP. BD.

H

HANDRAIL	HDR
HARDBOARD	HBD
HARDWARE	HDW
HEAD	HD
HEADER	HDR
HEATER	HTR
HEATING	HTG
HEIGHT	HT
HIGH POINT	H.PT.
HIGH PRESSURE WASHER	HPW
HIGH STRENGTH BOLT	HSB
HIGH-STRENGTH GYPSUM PLASTER	HSGYP
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HOT WATER	HW
HOT WATER REVERSE RETURN	HWRR
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HOLLOW METAL	HM
HORSE POWER	HP
HOSE BIBB	HB
HOT WATER	HW
HOT WATER HEATER	HWH
HOUR	HR
HYDRAULIC	HYD

I

IN ACCORDANCE WITH	IAW
ILLUMINATING ENG. SOCIETY	IES
INDUSTRIAL SEWER	IS
INCH	IN
INFRA-RED HEATER	IRH
INSIDE DIAMETER	I.D.
INSULATION	INSUL.
INTERCOM	IC
INTERIOR	INT
INTERNATIONAL BUILDING CODE	IBC
INVERT ELEVATION	IE
INVERT	IN OR INV.
IRON	I OR FE
IRON PIPE	I.P.

J

JANITOR CLOSET	JC
JOINT	JT
JOIST	JST
JUNCTION	JCT
JUNCTION BOX	JB

K

KEY	K
KEY LOCK	KL
KICK PLATE	KP
KILOVOLTS	KV
KILOVOLT AMPERES	KVA
KILOVOLT AMPERES REACTIVE	KVAR
KILOWATTS	KW
KITCHEN	KIT
KIPS/SQUARE INCH	KSI
KIPS/SQUARE FOOT	KSF
KILOWATT HOUR METER	KWH

L

LANDING	LDG
LAUNDRY	LAU
LAVATORY	LAV
LAWN IRRIGATION SYSTEM	LIS
LEFT	L
LENGTH	LG
LIGHT	LT
LIGHTING	LTG
LIGHT PROOF SHADE	LPS
LIGHT WEIGHT	LT. WT.
LINEAR	LIN
LINTEL	LNTL
LOAD	LD
LOADING	LDG
LONGITUDINAL	LONG
LONG - LEG HORIZONTAL	LLH
LONG - LEG VERTICAL	LLV
LOW POINT	LP
LUMBER	LBR
LUMEN	L

M

MACHINE	MACH
MAHOGANY	MHGY
MANHOLE	MH
MANUFACTURE	MFR
MANUFACTURING	MFG
MASONRY	MSNRY or MAS
MASONRY OPENING	MO
MASONRY UNIT	MU
MASTIC	MSTC
MATCH EXISTING	ME
MATCHED & BEADED	M & B
MATERIAL	MAT or MATL
MAXIMUM	MAX
MECHANICAL	MECH
MEDICINE CABINET	MC
MESH WIRE	MW
METAL	MET.
METAL LATH	ML
METAL THRESHOLD	MT
METER	M,m
MILLIMETER	MM,mm
MINIMUM	MIN
MISSOURI	MO
MISSOURI DEEPARTMENT OF TRANSPORTATION	MODOT
MONITORING WELL	MW
MONOLITHIC	MONO
MONUMENT	MON
MOTOR	MOT
MOTOR GENERATOR	MG
MOULDING	MLDG
MOUNTED	MTD
MOUNTAIN	MTN

N

NATIONAL ELECTRICAL CODE	NEC
NATIONAL ELECTRICAL MANUFACTURERS' ASSOCATION	NEMA
NATIONAL GEODETIC VERTICAL DATUM	N.G.V.D.
NEAR SIDE	NS
NORTH	N
NOT IN CONTRACT	NIC
NOT TO SCALE	NTS,N.T.S.
NUMBER	NO.

O

OBJECT	OBJ
OBSCURE	OBSC
OBSCURE GLASS	OBGL
OBSCURE WIRE GLASS	OB WG
OFFICE	OFF.
OIL WATER SEPARATOR	OWS
ON CENTERS	OC
OPENING	OPNG
OPPOSITE	OPP
OPPOSITE HAND	OPP. HD.
OPERATIONS	OPS
OUTSIDE AIR	OA
OUTSIDE DIMENSION	OD
OVERHEAD	OVHD,OH

P

PAINTED	PTD
PAIR	PR
PANEL	PNL
PANEL BOARD	PNL BD
PANIC BOLT	PAN. B
PARAPET	PRPT
PARTITION	PTN
PARK	PK
PARKWAY	PKWY
PAVEMENT DRAIN	PD
PENNY (as in nail-10d)	d
PERFORATED	PERF
PHASE	PH OR 0
PIECE	PC
PILING	PLG
PLASTER	PLAS
PLASTIC LAMINATE	P. LAM.
PLATE	PL OR P
PLATFORM	PLATF
PLUMBING	PLBG
PLYWOOD	PLY WD
POINT	PT
POINT OF INTERSECTION	PI
POINT OF TANGENCY	POT
POLE	P
POLISH	POL
PORCELAIN	PORC
POST INDICTOR VALVE	PIV
POUNDS	LBS
POUNDS/SQUARE FOOT	PSF
POUNDS/SQUARE INCH	PSI
POWER LINE	PL
POWER POLE	PP
PREFABRICATED	PREFAB
PRE - ENGINEERED METAL BUILDING	PEMB
PRESSURE REGULATING VALVE	PRV
PRESTRESSED	P/S
PRESTRESSED CONCRETE CYLINDER PIPE	PCCP
PROJECTION	PROJ
PROPOSED	PROP
PUBLIC ADDRESS	PA
PUSH BUTTON STATION	PBS

Q

QUARRY TILE	Q.T.
QUART	QT
QUARTER ROUND	¼RD
QUARTERS	QTERS

R

RADIATOR CONVECTOR	RC
RADIUS	RAD OR R
RANGE	RGE
RECEIVER	RCVR
RECEPTACLE	RECP
RECREATION	RECR
REFERENCE	REF OR RE:
REFRIGERATOR	REFR
REGISTER	REG
REGULAR	REG
REINFORCED CONCRETE BOX	RCB
REINFORCED CONCRETE PIPE	RCP
REINFORCEMENT	REINF
REINFORCED CONCRETE	RC
REMOTE CONTROL	RC
REMOVABLE	REM
REQUIRED	REQ'D
RETURN AIR	RA
REVISIONS	REV
RIDGE	RDGE
RISER	R
RIGHT	R
RIGHT OF WAY	ROW
ROAD	RD
ROOF DRAIN	R.D.
ROOFING	RFG
ROOM	RM
ROUGH	RGH
ROUND	RD OR Ø
RUBBER	RUB
RUBBER BASE	RB
RIGHT OF WAY	R/W

S

SANITARY SEWER	SS
SANITARY SEWER MANHOLE	SSMH
SOUTHWESTERN BELL COMMUNICATIONS	SBC
SCHEDULE	SCH
SCREW	SCR
SCUTTLE	SCUT
SECRETARY	SECY
SECTION	SECT
SEQUENCE	SEQ
SHALE	SH
SHEATHING	SHTHG
SHEET	SHT
SHEET METAL	SH MET OR SM
SIDEWALK	S/W
SIGNAL LIGHT	SGL
SIMILAR	SIM
SLOPE	S
SOUNDPROOF	SPF
SOUTH	S
SOUTHWEST	SW
SOUTHWESTERN BELL TELEPHONE	SWBT
SPACE HEATER	SPH
SPACING	SP OR SPA
SPEAKER	SPKR
SPECIAL	SPL
SPECIFICATIONS	SPEC
SPRAR UNIT	SU
SPLASH BLOCK	SB
SQUARE	SQ OR I
SQUADRON	SQUAD
STAINLESS STEEL	S.ST.
STAIRWAY	STWY
STANDARD	STD
STATION	STA
STEEL	STL
STIFFENER	STF
STONE	STN
STORAGE	STOR
STORM DRAIN	SD
STORM DRAIN MANHOLE	SDMH
STORM SEWER	S
STREET LIGHT	SL
STRINGER	STGR
STRUCTURAL	STR
STRUCTURAL CLAY TILE	SCT
STRUCTURAL FACING UNIT	SFU
STREET	ST
SUB FLOOR	SUB FL
SUPPLY AIR	SA
SUPPLY AIR FAN	SAF
SUPPLY DIFFUSER	S.D.
SUPPLY REGISTER	SR
SUSPENDED	SUSP
SWITCH	SW
SWITCHBOARD	SWBD
SYMMETRICAL	SYMM

T

TACK BOARD	TBD
TANGENT	TAN.
TANK	T
TELEPHONE	TEL
TELEVISION	TV
TEMPERATURE	TEMP
TERMINAL	TERM
TERRAZZO	TER
THERMOSTAT	THERMO
THICK	THK
THOUSAND	M
THOUSAND CIRCULAR MILLS	MCM
THRESHOLD	TH
TO BE REMOVED AND REPLACED	TBR&R
TOGGLE	TGL
TOILET	TOIL.
TOP AND BOTTOM	TAB
TOP OF	T.O.
TOP OF CONCRETE	TOC
TOP OF STEEL	TOS
TOPOGRAPHY	TOPO
TRAINING	TRNG
TRAINING AREA	TA
TRANSFER DUCT	TD
TRANSFORMER	XFMR
TRANSVERSE	TRANSV
TREAD	T
TYPICAL	TYP

U

UNDERGROUND ELECTRIC	UGE
UNDERGROUND	UG
UNDERWRITERS' LABORATORIES	UL
UNEXCAVATED	UNEX
UNFINISHED	UNFIN
UNLESS NOTED OTHERWISE	UNO
UNIT COOLER	UC
UNIT HEATER	UH
UNIT VENTILATOR	UV
UNITED STATES	U.S.
URINAL	UR
USE IN PLACE	UIP
UTILITY	UT, UTIL

V

VARIES	VAR
VENTILATION	VENT
VENTILATOR	VENT
VENT STACK	VS
VENT THRU ROOF	VTR
VERTICAL	VERT
VESTIBULE	VEST
VINYL COMPOSITION TILE	VCT
VINYL BASE	VB
VINYL-WALL COVERING	VC
VITRIFIED CLAY PIPE	VCP
VOLT	V
VOLUME	VOL

W

WALL HYDRANT	WH
WARDROBE	WRB
WASHER	W
WASTE STACK	WS
WATER CLOSET	WC
WATER ELEVATION	W.E.
WATER LINE	WL
WATER PROOF	WPF
WATER PROOFING	WPFG
WATER VALVE	WV
WATTHOUR METER	WHM
WEAPON STORAGE AREA	WSA
WEATHER PROOF	WP
WEATHER STRIPPING	WS
WEIGHT	WT
WELDED WIRE FABRIC	WWF
WEST	W
WET BULB	WB
WHITE	WHT
WIDE FLANGE	WF
WINDOW	WDW
WINDOW DIMENSION	WDW DIM
WITH	W/
WITHIN	W/I
WITHOUT	W/O
WOOD	WD
WOOD BLOCKING	WD. BLK.
WOOD DOOR	W. DR.
WOOD THRESHOLD	WD. TH.
WORK SHOP	WKS
WROUGHT IRON	W.I.

Y

YARD	YD
YARD DRAIN	Y.D.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
△	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Drawn by: MLW
Checked by:
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale:
CADD File Name: brbt0103.dgn

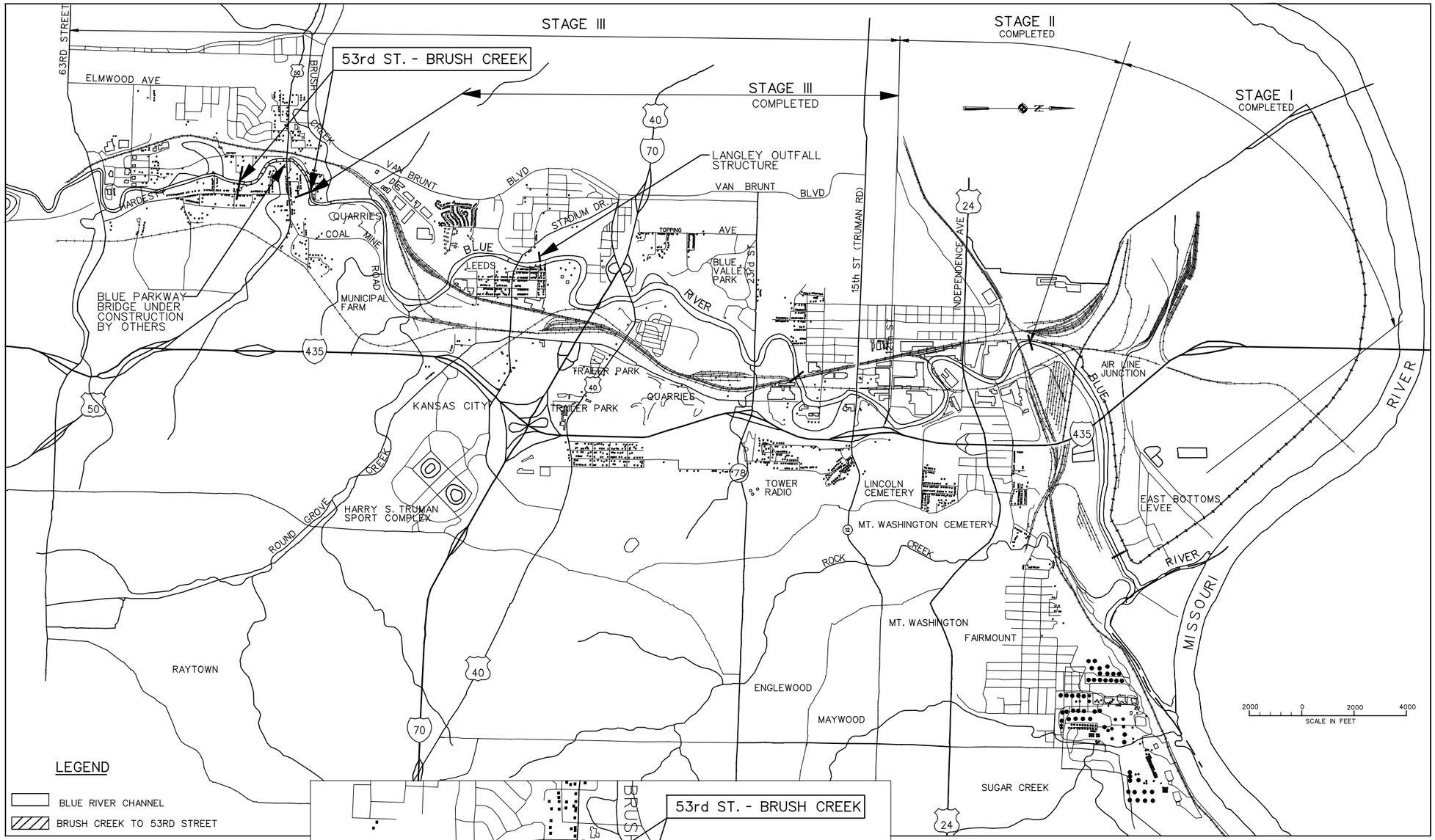
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

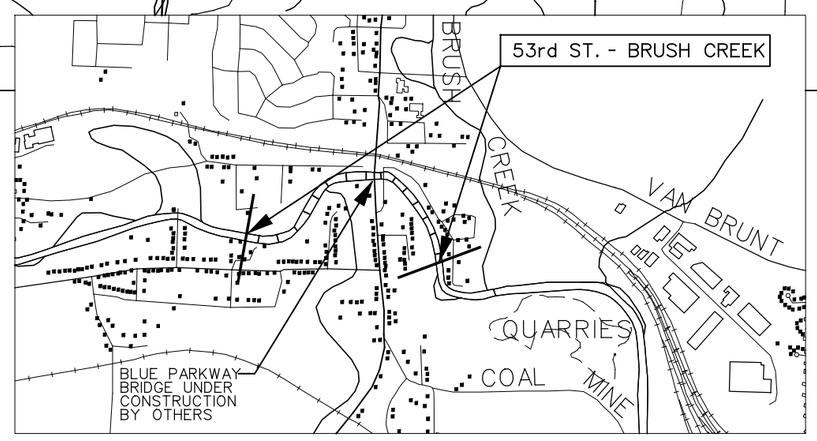
HDR Engineering, Inc.

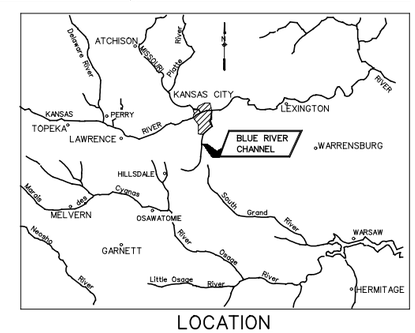
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

ABBREVIATIONS

Sheet Reference Number:
T1.3







LOCATION

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawing code:
Drawn by: MLW
Plot scale:
Checked by:
Plot date:
Submitted by: TJK
CADD File Name: brsc01dlgn

U.S. ARMY ENGINEER DISTRICT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

LOCATION AND VICINITY

Sheet Reference Number:
C1.1

BLUE RIVER CHANNEL CENTERLINE ALIGNMENT DATA

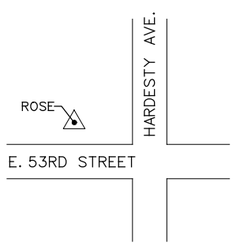
PI	NORTHING	EASTING	DIST.	AZIMUTH FROM S.	P.I. STA.	P.C. STA.	P.T. STA	Δ	D	T	R	L	REMARKS
3	1,041,805.00	492,980.00			79+64.84	75+88.06	83+37.33	14° 59'07"	2.00	376.78	2864.79	749.27	
			1294.96	198° 13'30"									
4	1,043,035.00	493,385.00			92+55.50	87+13.62	96+41.41	74° 13'23"	8.00	541.88	716.20	927.79	
			989.93	124° 00'07"									
5	1,043,588.59	492,564.33			100+89.46	98+47.65	102+88.61	58° 25'38"	13.25	241.81	432.42	440.96	
			856.63	182° 25'46"									
6	1,044,444.45	492,600.64			109+03.43	105+28.59	112+12.78	58° 09'22"	8.50	374.84	674.07	684.19	
			1817.46	240° 35'08"									
7	1,045,337.05	494,183.81			126+75.45	122+89.16	129+60.95	65° 10'26"	10.00	366.24	572.96	651.74	EQ. STA. 122+89.16 BK = STA. 123+09.21 AHD
			1671.67	175° 24'42"									
8	1,047,003.36	494,050.08			142+66.38								

BLUE RIVER PHOTOGRAMMETRIC CONTROL
BRUSH CREEK TO 53RD STREET

POINT ID	NORTHING	EASTING	ELEVATION
3T-11	1045569.402	494455.347	752.72
3T-13	1044302.463	492882.129	758.96
ROSE	1042215.812	493768.907	767.62
T-7B	1044333.386	494737.348	773.40

MISSOURI STATE PLANE COORDINATE SYSTEM
MERCATOR PROJECTION NAD-27 MISSOURI WEST ZONE

ELEVATIONS BASED ON NGVD 1929



CONTROL POINT "ROSE": NEAR THE N.E. 1/16 COR. SEC. 35, T-49-N, R-33-W, JACKSON CO., MISSOURI. A STD. C.E. BRASS CAP STAMPED "ROSE 1974" IN CONC. POST 0.2' BELOW GROUND SURFACE, 53' W. OF ℄ HARDESTY AVE. AND 15.5' N. OF E. 53RD STREET.

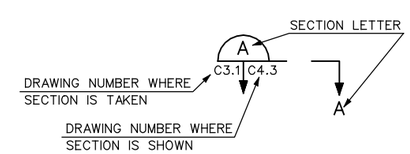
7.23' N. TO SHINER IN POWER POLE
42.10' S. TO SHINER IN 18" WALNUT
87.31' E.N.E. TO "+" ON STEEL CAMP POLE.
73.97' S.W. TO SHINER IN 8" HACKBERRY.

CONTROL POINT "ROSE"

GENERAL NOTES:

1. SEE DRAWING NO. G1.1 TO G1.4 FOR BORING LOGS.
2. SEE DRAWING NO. C4.1 AND C4.2 FOR TYPICAL SECTIONS.
3. SEE DRAWING NO. C4.11 AND C4.12 FOR RIPRAP GUTTER DETAILS.
4. TOPOGRAPHY BY COE STANDARD PHOTOGRAMMETRIC PROCESS FROM AERIAL PHOTOS TAKEN BY WESTERN AIR MAPS DATED 1995.
5. THE CHANNEL ALIGNMENT AND PROFILE SHOWN WITHIN THIS PLAN SET SHALL BE ADHERED TO BY THE CONTRACTOR UNLESS A MODIFICATION IS PROPOSED AND APPROVED BY THE CONTRACTING OFFICER.

SYMBOL IDENTIFICATION



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawn by: MLW
Drawing code:
Checked by:
Plot scale:
Submitted by: TJK
CADD File Name: brcc07b2.dgn

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CENTERLINE ALIGNMENT AND SURVEY DATA

Sheet Reference Number:
C1.2

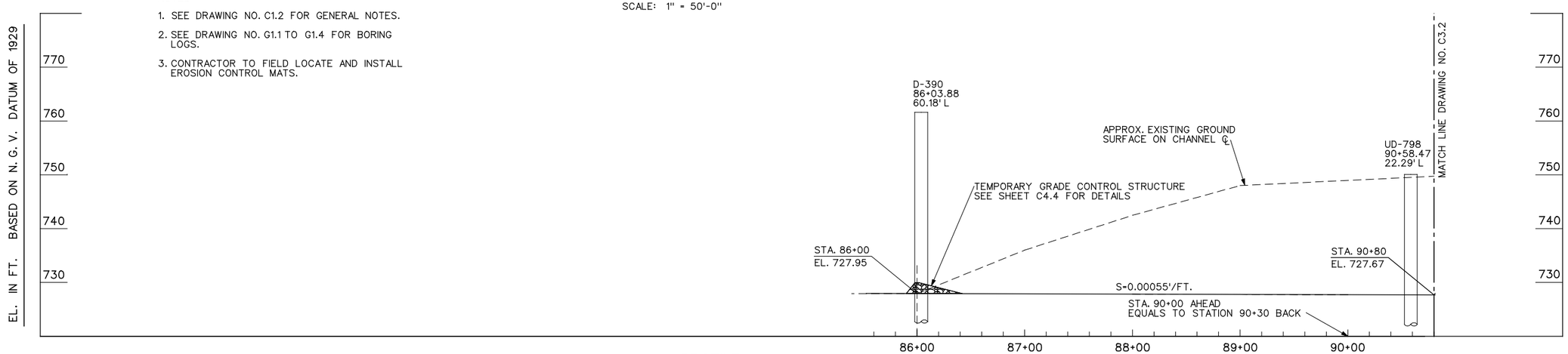
PLAN

50' 0 50' 100'

SCALE: 1" = 50'-0"

NOTES:

1. SEE DRAWING NO. C1.2 FOR GENERAL NOTES.
2. SEE DRAWING NO. G1.1 TO G1.4 FOR BORING LOGS.
3. CONTRACTOR TO FIELD LOCATE AND INSTALL EROSION CONTROL MATS.



PROFILE

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by: RD
Drawn by: RD, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: bxbc03010sgn

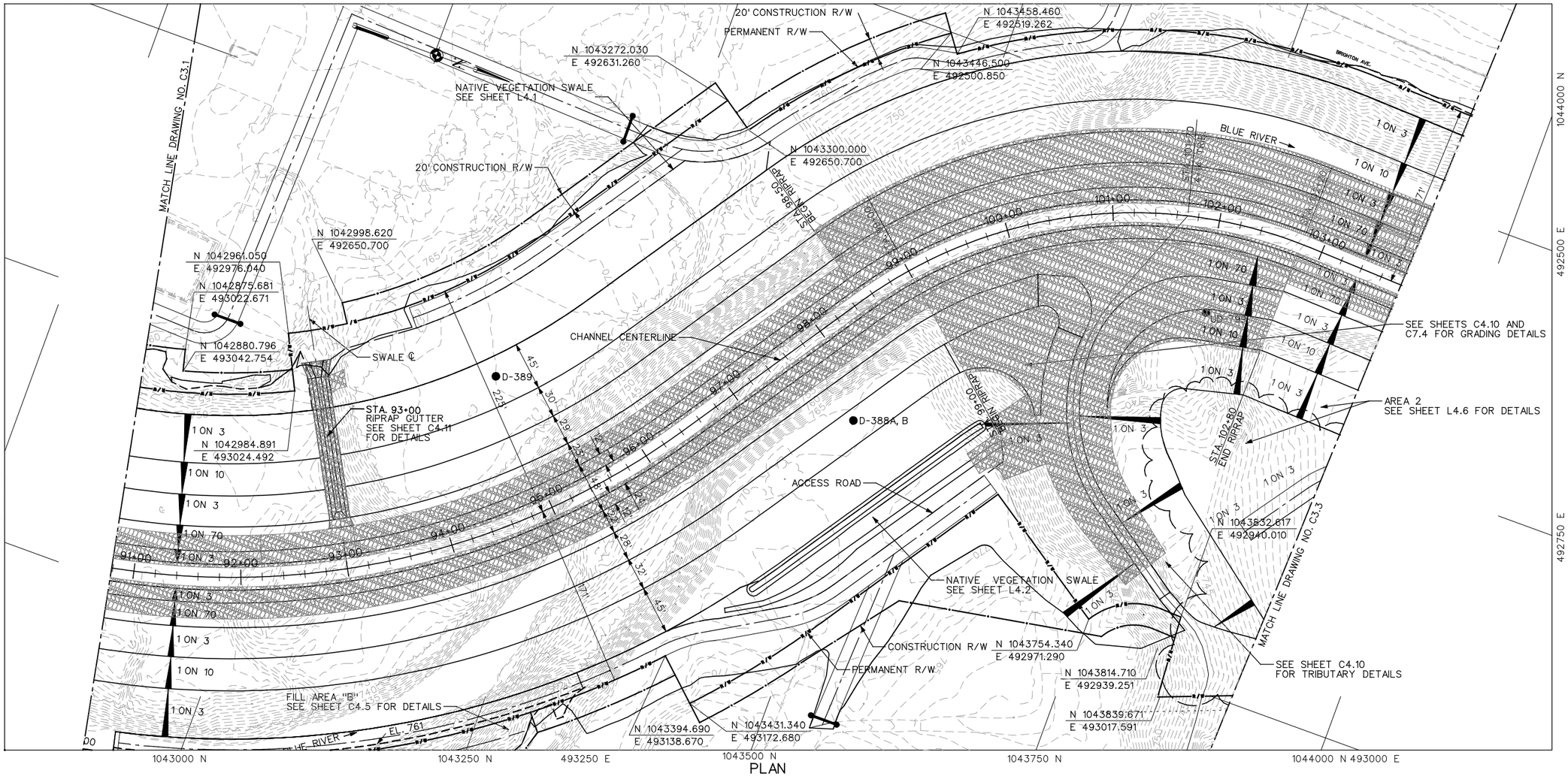
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL PLAN AND PROFILE
STA. 86+00 TO STA. 90+80

Sheet Reference Number:
C3.1



PLAN

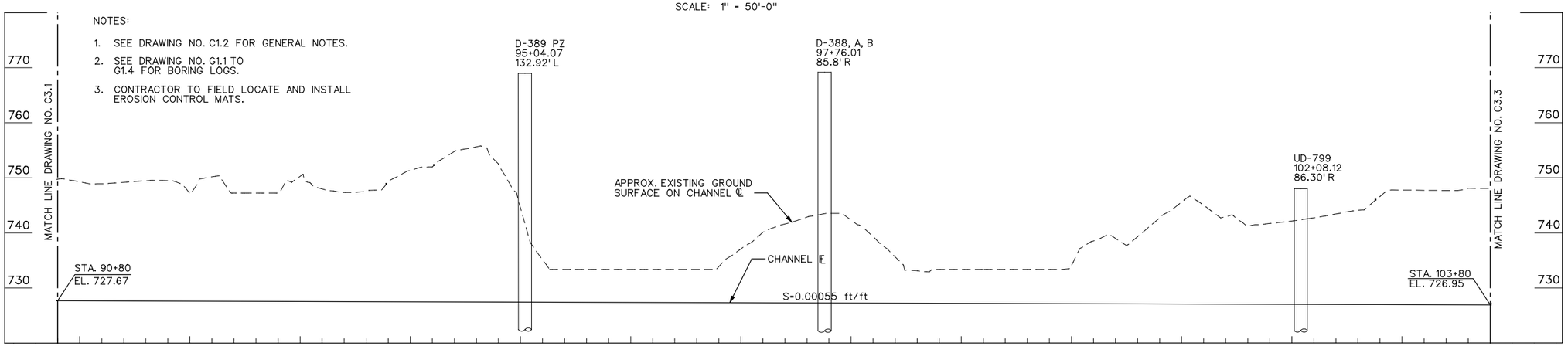
50' 0 50' 100'

SCALE: 1" = 50'-0"

EL. IN FT. BASED ON N. G. V. DATUM OF 1929

NOTES:

1. SEE DRAWING NO. C1.2 FOR GENERAL NOTES.
2. SEE DRAWING NO. G1.1 TO G1.4 FOR BORING LOGS.
3. CONTRACTOR TO FIELD LOCATE AND INSTALL EROSION CONTROL MATS.



PROFILE

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/05/08	

Designed by: RD
Drawn by: RD, JAS
Checked by: MJW
Submitted by: LAK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: bxbc0302.dgn

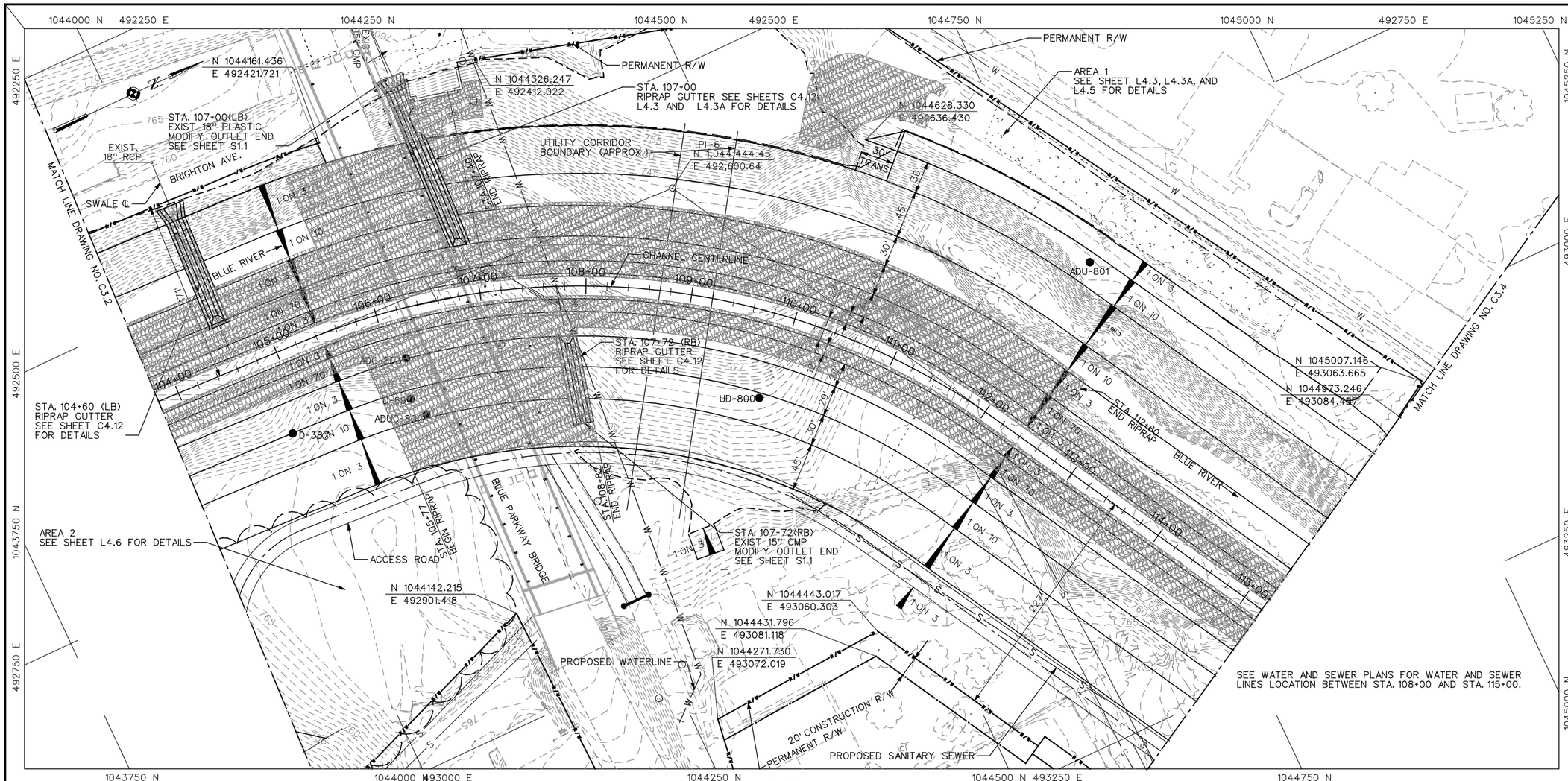
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL PLAN AND PROFILE
STA. 90+80 TO STA. 103+80

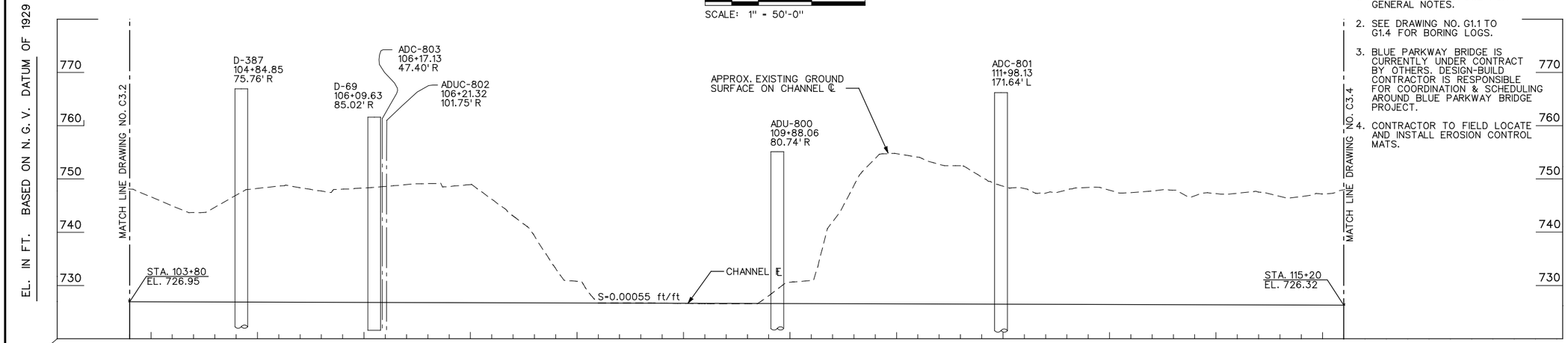
Sheet Reference Number:
C3.2



PLAN

50' 0 50' 100'

SCALE: 1" = 50'-0"



PROFILE

NOTES:

1. SEE DRAWING NO. C1.2 FOR GENERAL NOTES.
2. SEE DRAWING NO. G1.1 TO G1.4 FOR BORING LOGS.
3. BLUE PARKWAY BRIDGE IS CURRENTLY UNDER CONTRACT BY OTHERS. DESIGN-BUILD CONTRACTOR IS RESPONSIBLE FOR COORDINATION & SCHEDULING AROUND BLUE PARKWAY BRIDGE PROJECT.
4. CONTRACTOR TO FIELD LOCATE AND INSTALL EROSION CONTROL MATS.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD
Drawn by: RD, JAS
Checked by: MJW
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: b1ec0303.dgn

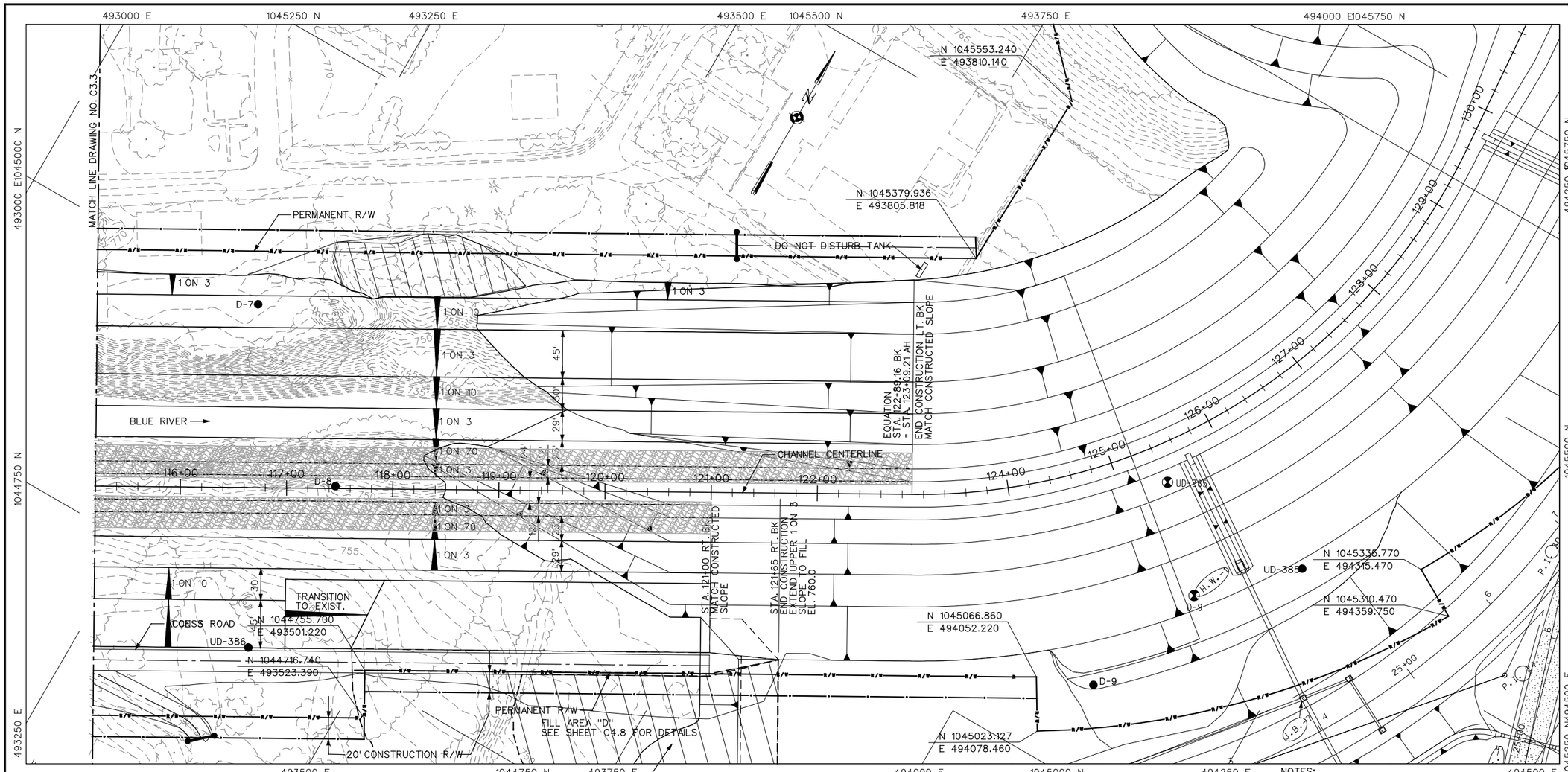
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL PLAN AND PROFILE
STA. 103+80 TO STA. 115+20

Sheet Reference Number:
C3.3

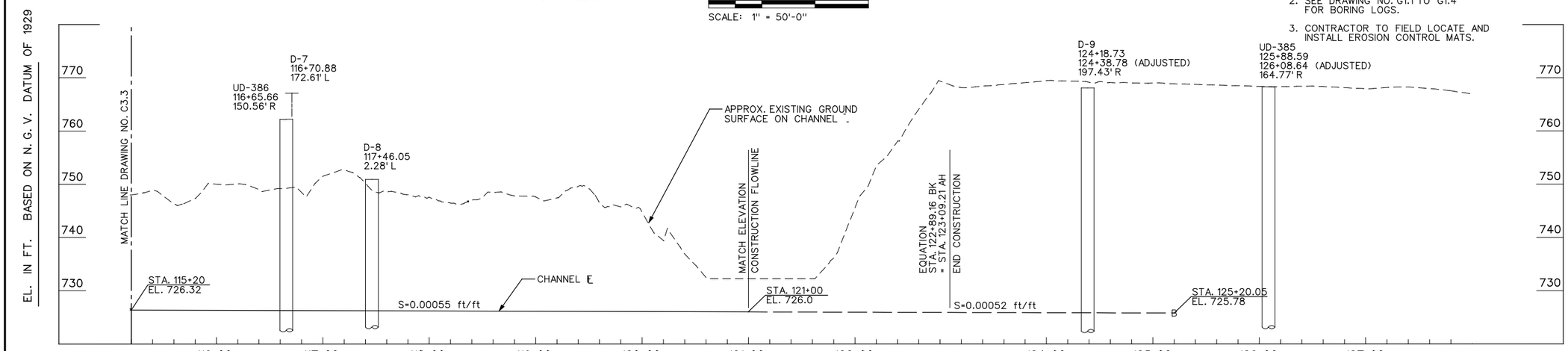


PLAN

SCALE: 1" = 50'-0"

NOTES:

1. SEE DRAWING NO. C1.2 FOR GENERAL NOTES.
2. SEE DRAWING NO. G1.1 TO G1.4 FOR BORING LOGS.
3. CONTRACTOR TO FIELD LOCATE AND INSTALL EROSION CONTROL MATS.



PROFILE

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: RD
Drawn by: RD, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: bxbc0304.dgn

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

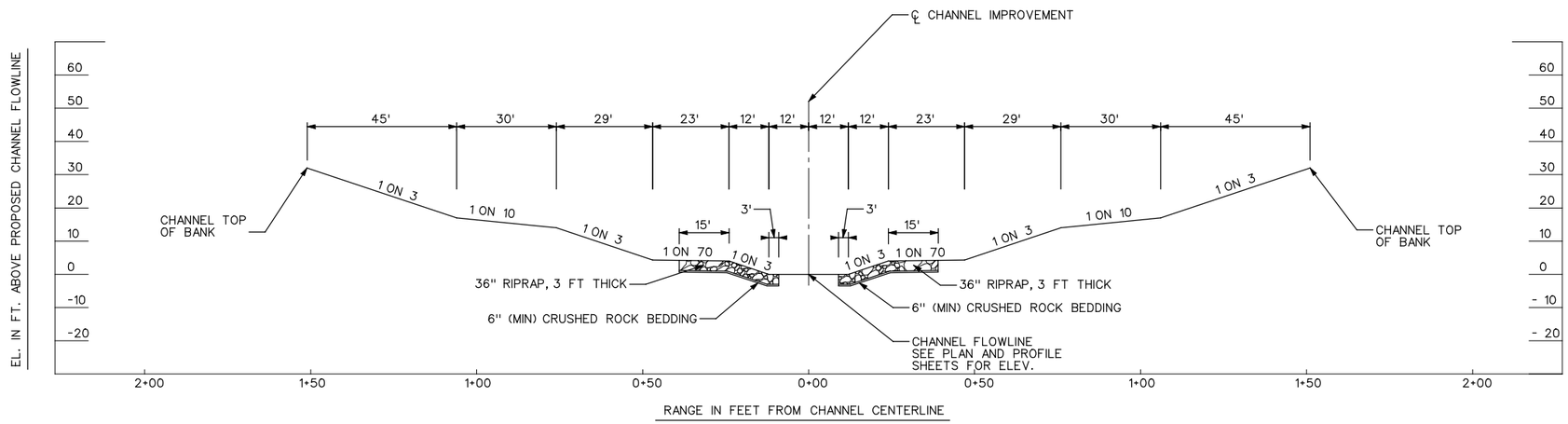
HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL PLAN AND PROFILE
STA. 115+20 TO
STA. 122+89.15BK (EQ.)

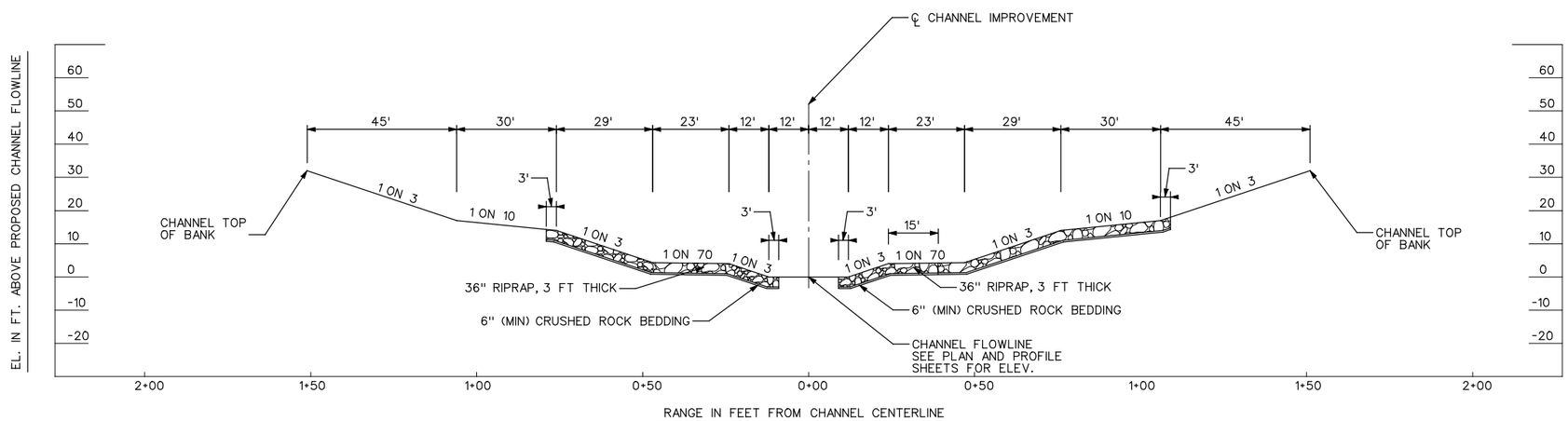
Sheet Reference Number:
C3.4

NOTE: FOR TRANSITION SECTIONS BETWEEN STA. 86+00 AND STA. 90+00, SEE SHEETS C5.1 AND C5.2



STA. 90+00 AHEAD TO STA. 98+50 BACK

SCALE: VERT. 1" = 20'0"
HORIZ. 1" = 20'0"



STA. 98+50 AHEAD TO STA. 104+50 BACK

SCALE: VERT. 1" = 20'0"
HORIZ. 1" = 20'0"

NOTES:
1. PLACE ROCK RIPRAP ON RIGHT BANK BEYOND 15 FT WIDTH ON 1 ON 70 SLOPE TO 3 FT BEYOND 1 ON 10 SLOPE BETWEEN STA. 99+00 AHEAD AND STA. 102+20 BACK.
2. RIGHT BANK OF CHANNEL NEAR TRIBUTARIES AT STA. 90+65 AND STA. 101+70 MODIFIED TO MATCH GRADING OF TRIBUTARY. SEE SHEETS C4.9, C4.1 AND C4.10 FOR DETAILS.
3. ROCKFILL IS TO BE USED IN LIEU OF BEDDING UNDER WATER.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by: RD
Date: AUGUST 2008
Drawn by: RD, JAS
Drawing code:
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Plot scale: AS NOTED ON SHEET
Submitted by: TJK
CADD File Name: brsc-c4-01.dgn

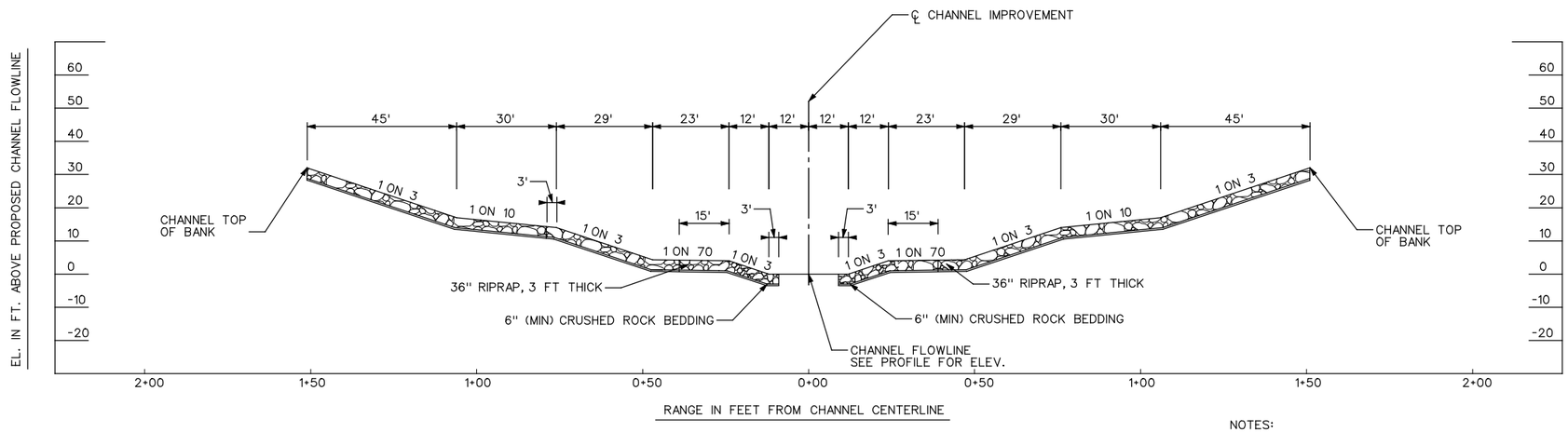
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TYPICAL CHANNEL SECTIONS
SHEET 1

Sheet Reference Number:
C4.1



STA. 104+50 AHEAD TO STA.. 108+20 BACK

SCALE: VERT. 1" = 20'0"
HORIZ. 1" = 20'0"

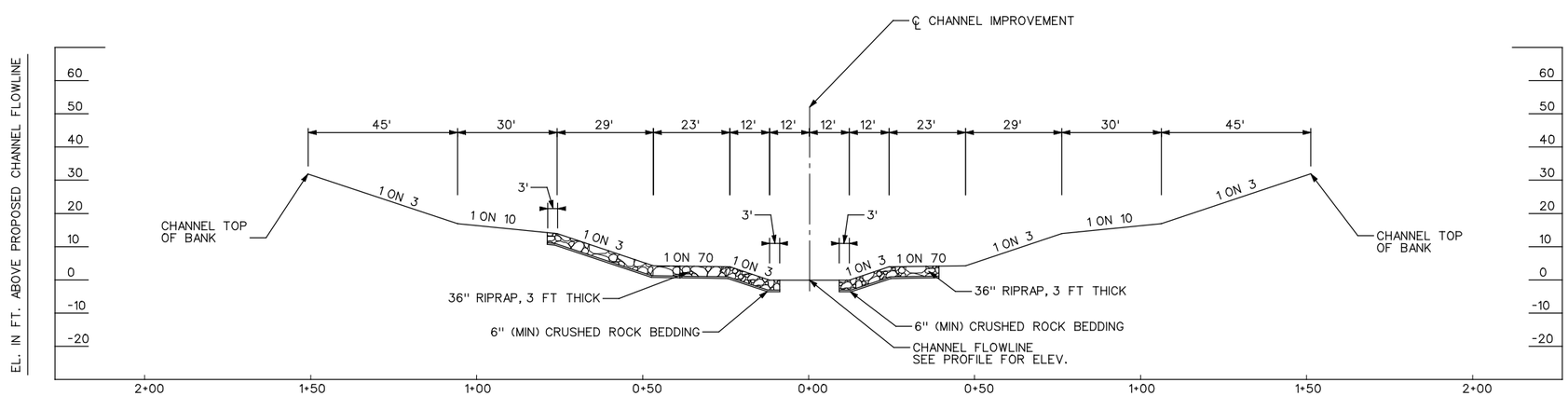
NOTES:

PLACE ROCK RIPRAP ABOVE MIDDLE 1 ON 3 SIDE SLOPE TO CHANNEL TOP OF BANK BETWEEN STA. 105+68 AHEAD AND STA. 107+46 BACK ON LEFT BANK.

PLACE ROCK RIPRAP BEYOND 15 FT WIDTH ON 1 ON 70 SIDE SLOPE TO CHANNEL TOP OF BANK BETWEEN STA. 105+68 AHEAD AND STA. 107+82 BACK ON RIGHT BANK.

ROCKFILL IS TO BE USED IN LIEU OF BEDDING UNDER WATER.

SEE CROSS-SECTION SHEETS C5.1-C5.16.



STA. 108+20 AHEAD TO STA. 118+50 BACK

SCALE: VERT. 1" = 20'0"
HORIZ. 1" = 20'0"

NOTES:

PLACE ROCK RIPRAP BEYOND 15 FT WIDTH ON 1 ON 70 SIDE SLOPE TO 3 FT BEYOND TOP OF MIDDLE 1 ON 3 SLOPE BETWEEN STA. 107+46 AHEAD AND STA. 112+60 BACK ON LEFT BANK.

ROCKFILL IS TO BE USED IN LIEU OF BEDDING UNDER WATER.

SEE CROSS-SECTION SHEETS C5.1-C5.16.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

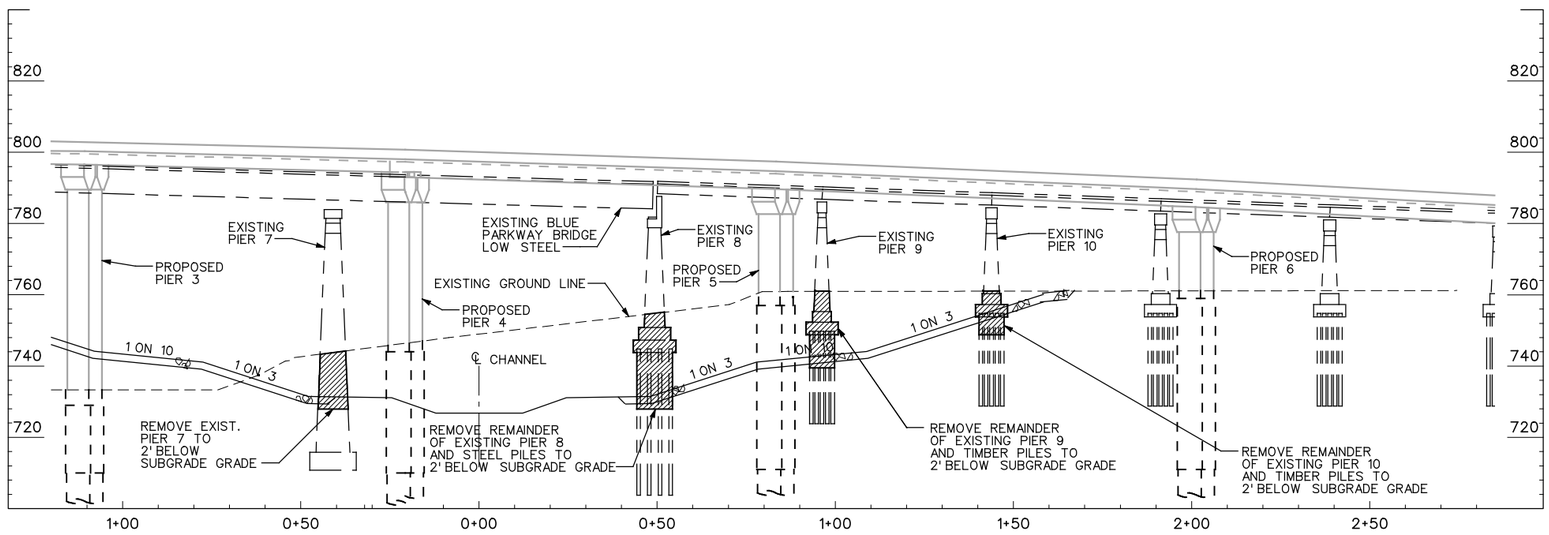
Designed by: RD
Date: AUGUST 2008
Drawn by: RD, JAS
Drawing code:
Checked by: MWJ
Plot scale: AS NOTED ON SHEET
Submitted by: TJK
CADD File Name: brsc5-012.dgn

U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI
ALDERSON-ENGINEERS
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TYPICAL CHANNEL SECTIONS
SHEET 2

Sheet Reference Number:
C4.2



EXISTING AND PROPOSED BLUE PARKWAY BRIDGE, STA. 106+42

NOTES:

1. PLACE RIPRAP TO COVER THE AREA UNDER THE BRIDGE AND EXTENDING A DISTANCE OF 10' BEYOND THE UPSTREAM AND DOWNSTREAM EDGE OF BRIDGE. THEN TRANSITION BACK TO TYPICAL CHANNEL SECTIONS.

2. FLOWLINE AT ℄ CHANNEL EL 726.81.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawing code:
Drawn by:
Plot scale:
Checked by:
CADD File Name: brec-043.dgn
Submitted by: TJK

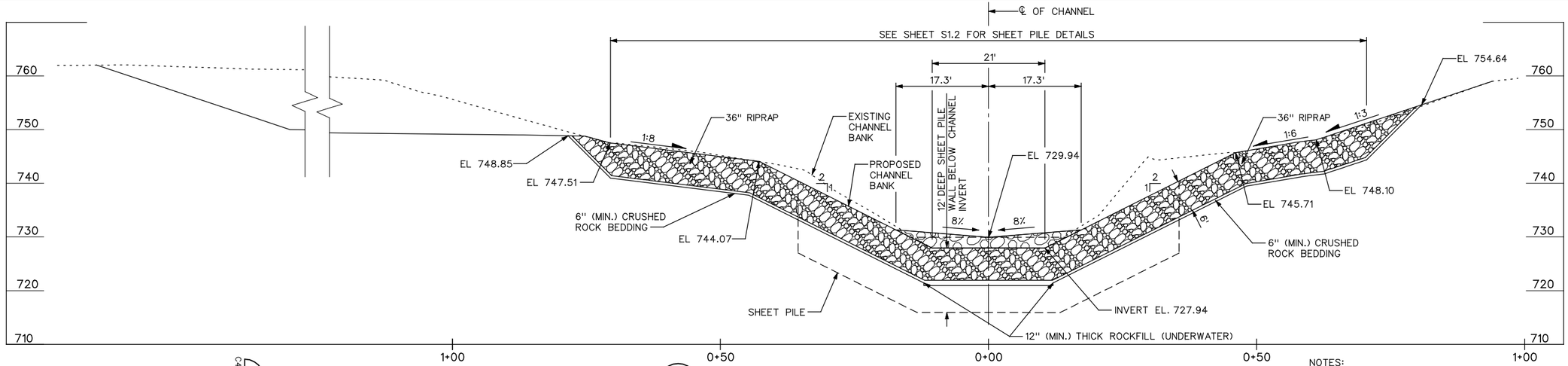
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

BLUE PARKWAY BRIDGE DEMOLITION

Sheet Reference Number:
C4.3



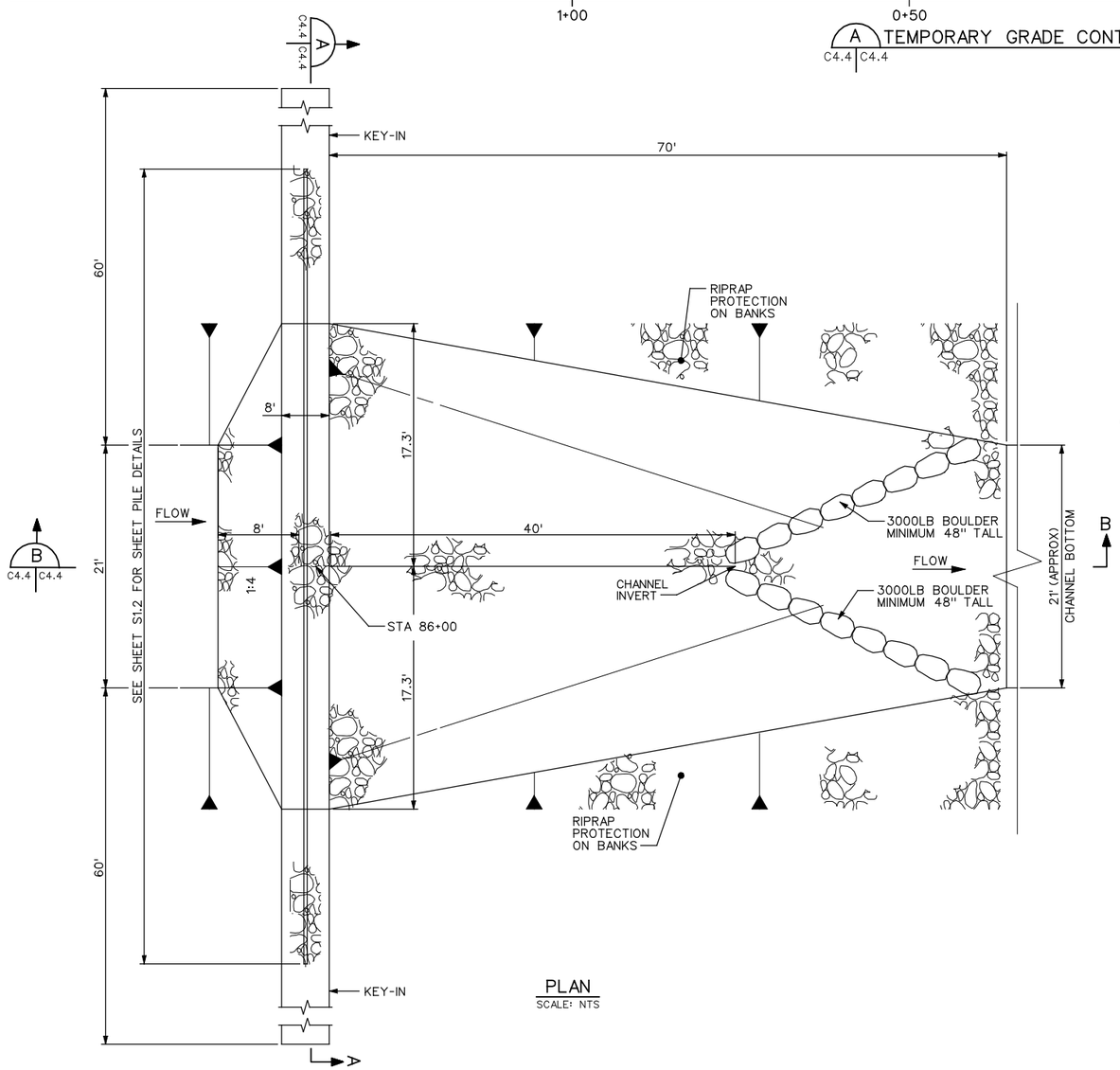
A TEMPORARY GRADE CONTROL STRUCTURE, CROSS-SECTION AT STA. 86+00

C4.4 | C4.4

SCALE: VERT. 1" = 10'0"
HORIZ. 1" = 10'0"

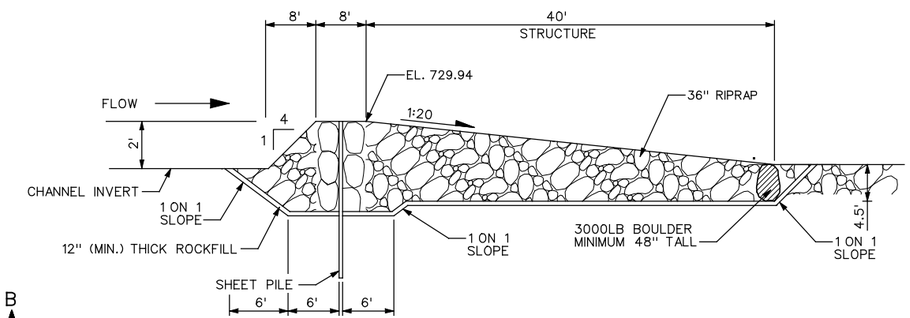
NOTES:

ROCKFILL IS TO BE USED IN LIEU OF BEDDING UNDER WATER.



PLAN

SCALE: NTS



SEE SHEET S1.2 FOR DETAILS

B SECTION THROUGH THALWEG

C4.4 | C4.4

SCALE: NTS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by: SVG, RD
Drawn by: ADW, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: AS NOTED ON SHEET
CADD File Name: brsc04c4.dgn

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

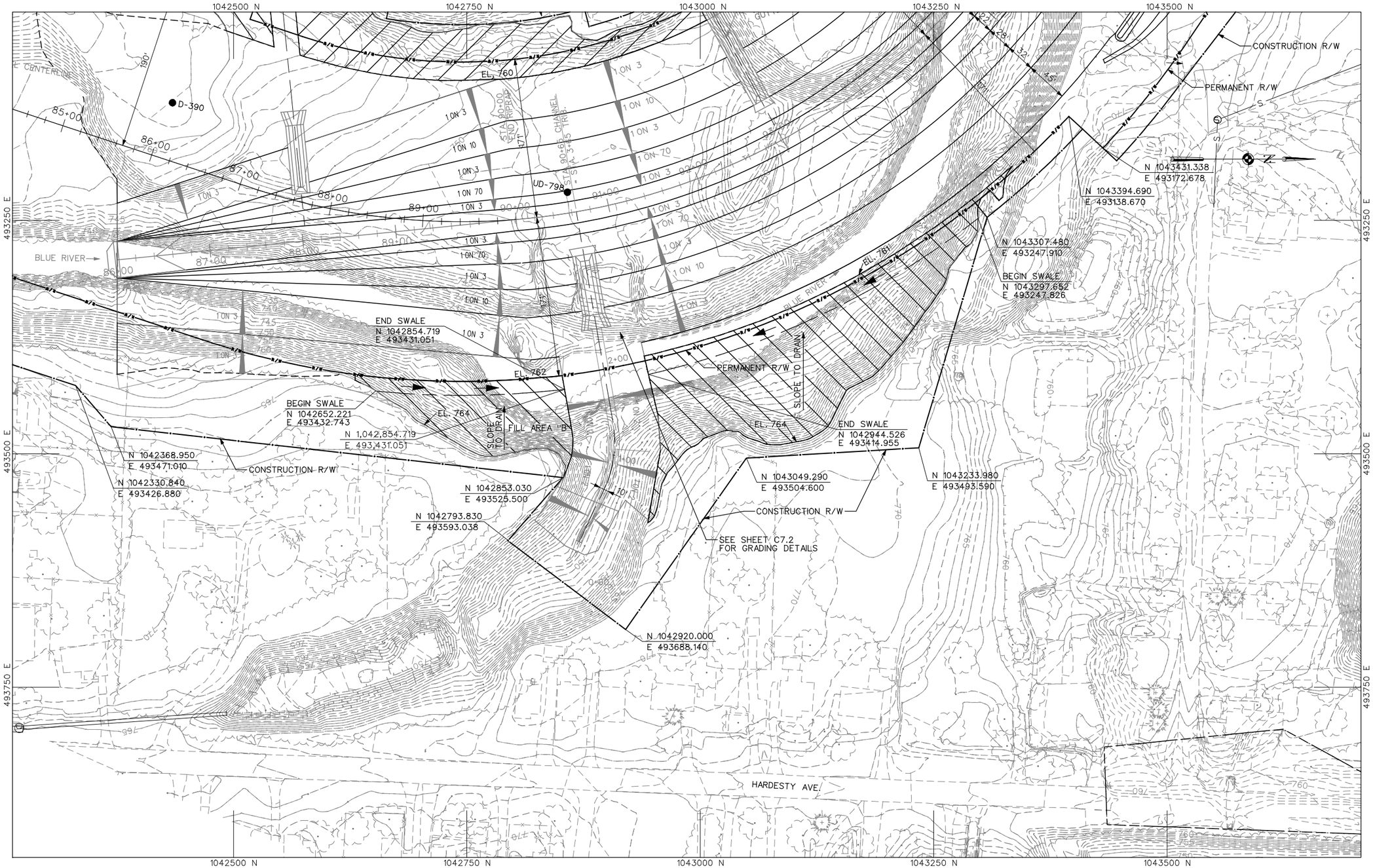
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL TRANSITION SECTIONS

Sheet Reference Number:

C4.4



FILL AREA "B"

50' 0 50' 100'

SCALE: 1" = 50'-0"

CONTRACTOR SHALL USE DESIGNATED FILL AREAS FOR TEMPORARY AND PERMANENT DEPOSITS OF SPOILS.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF, RD
Drawn by: JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CAD File Name: brsch-05c.dgn

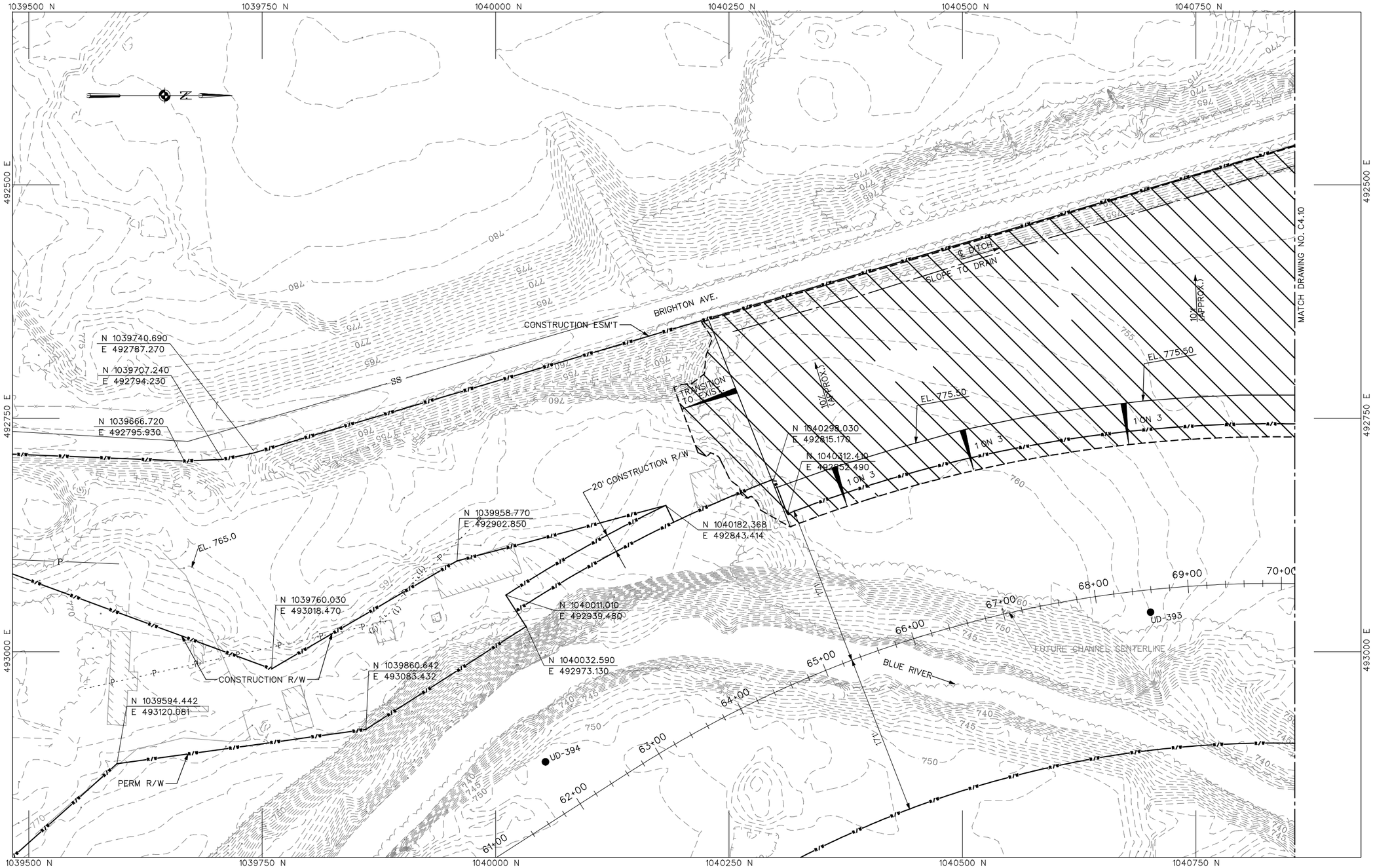
U.S. ARMY ENGINEER DISTRICT
CLAYCOMO, MISSOURI
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

FILL AREA "B"

Sheet Reference Number:
C4.5



FILL AREA "C"

50' 0 50' 100'

SCALE: 1" = 50'-0"

CONTRACTOR SHALL USE DESIGNATED FILL AREAS FOR TEMPORARY AND PERMANENT DEPOSITS OF SPOILS.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF, RD
Date: AUGUST 2008
Drawn by: JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: brsch-06.dgn

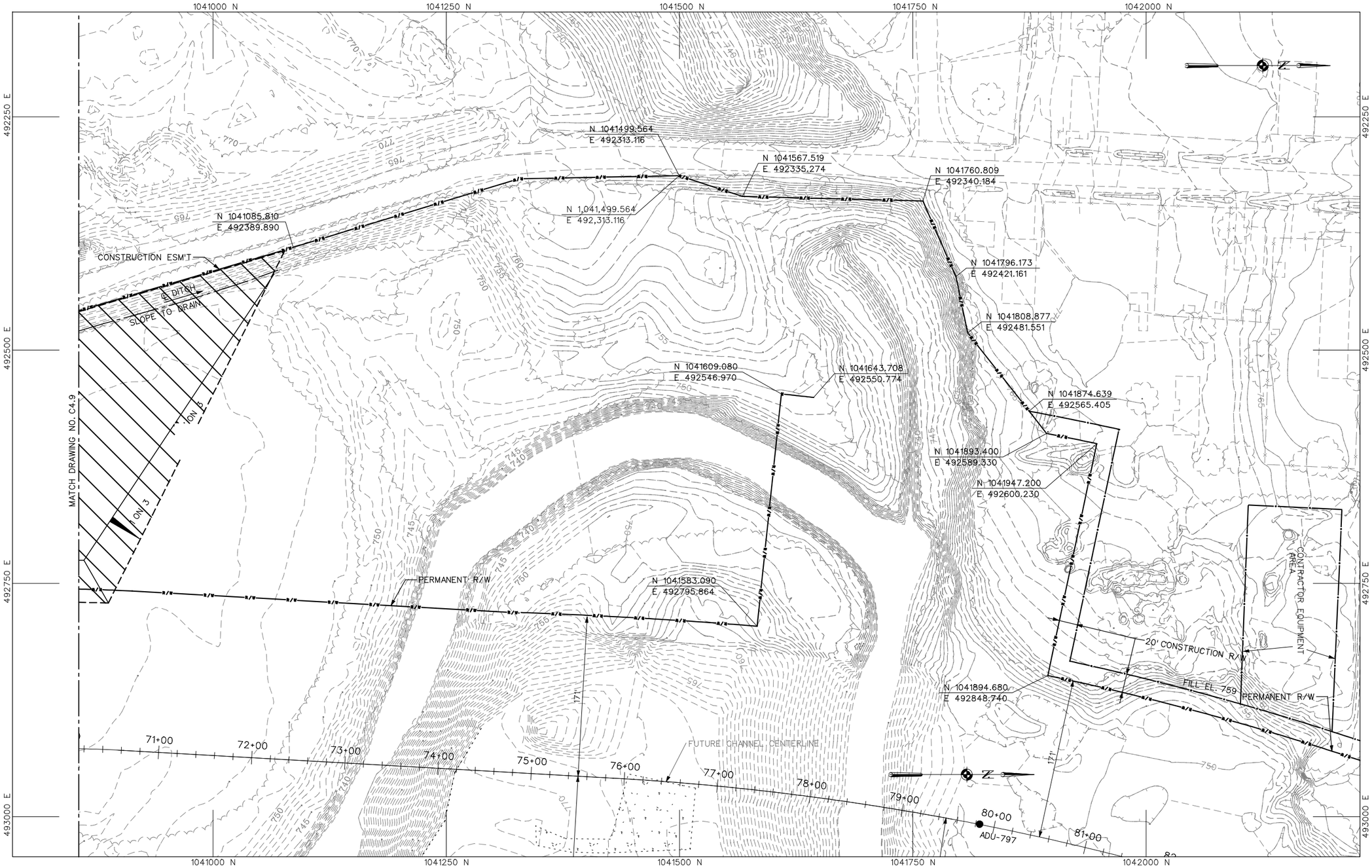
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

FILL AREA "C"
SHEET 1

Sheet Reference Number:
C4.6



FILL AREA "C"

SCALE: 1" = 50'-0"

CONTRACTOR SHALL USE DESIGNATED FILL AREAS FOR TEMPORARY AND PERMANENT DEPOSITS OF SPOILS.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Date: AUGUST 2008
Drawing code:
Designed by: NLF, RD
Drawn by: JAS
Plot scale: 1" = 50'-0"
Checked by: MWJ
CADD File Name: bxbc04-07.dgn
Submitted by: TJK

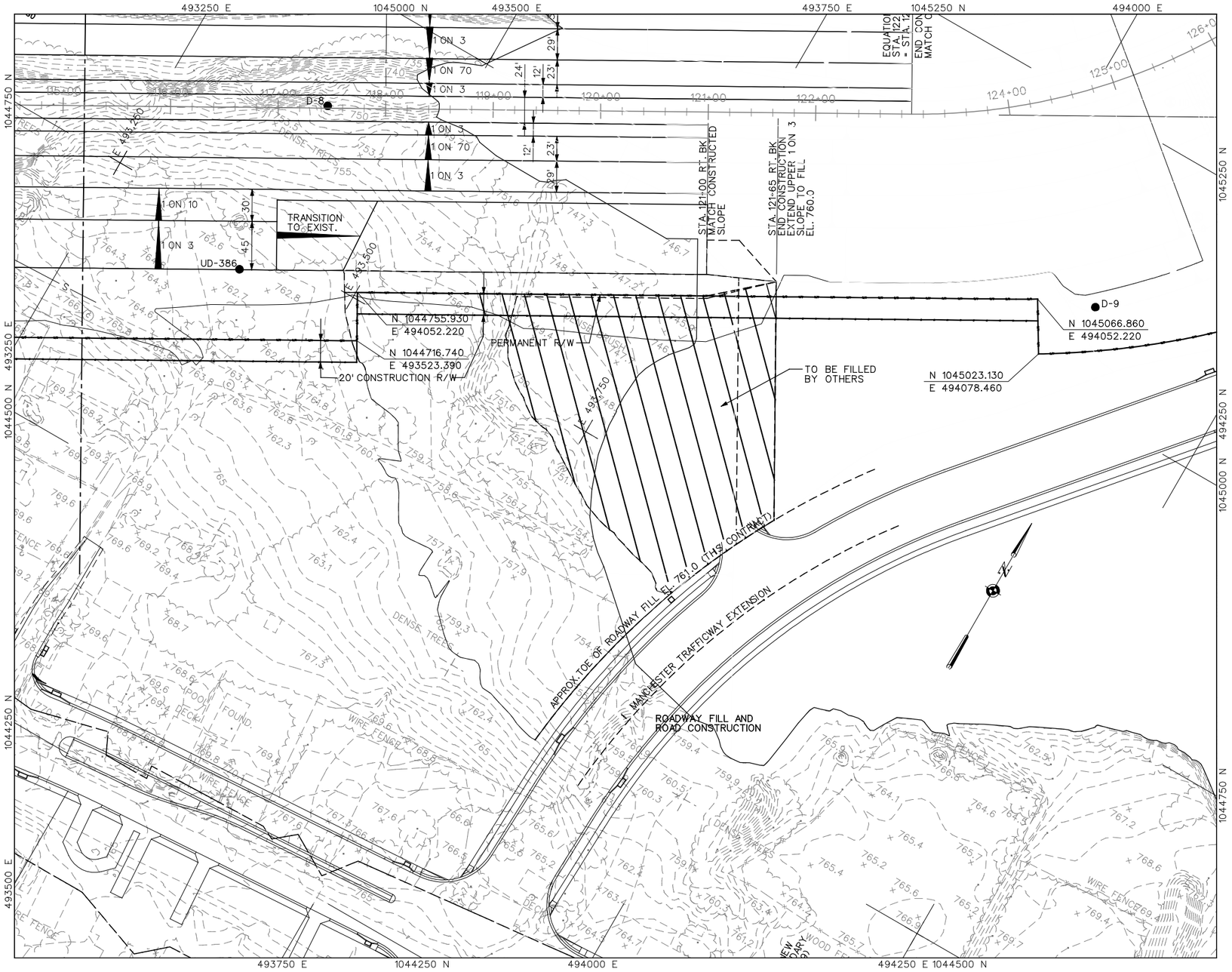
U.S. ARMY ENGINEER DISTRICT
KOPPERS COMPANIES
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

FILL AREA "C"
SHEET 2

Sheet Reference Number:
C4.7



FILL AREA "D"

50' 0 50' 100'

SCALE: 1" = 50'-0"

CONTRACTOR SHALL USE DESIGNATED FILL AREAS FOR TEMPORARY AND PERMANENT DEPOSITS OF SPOILS.

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF, RD
Drawn by: JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: brsch-d08.dgn

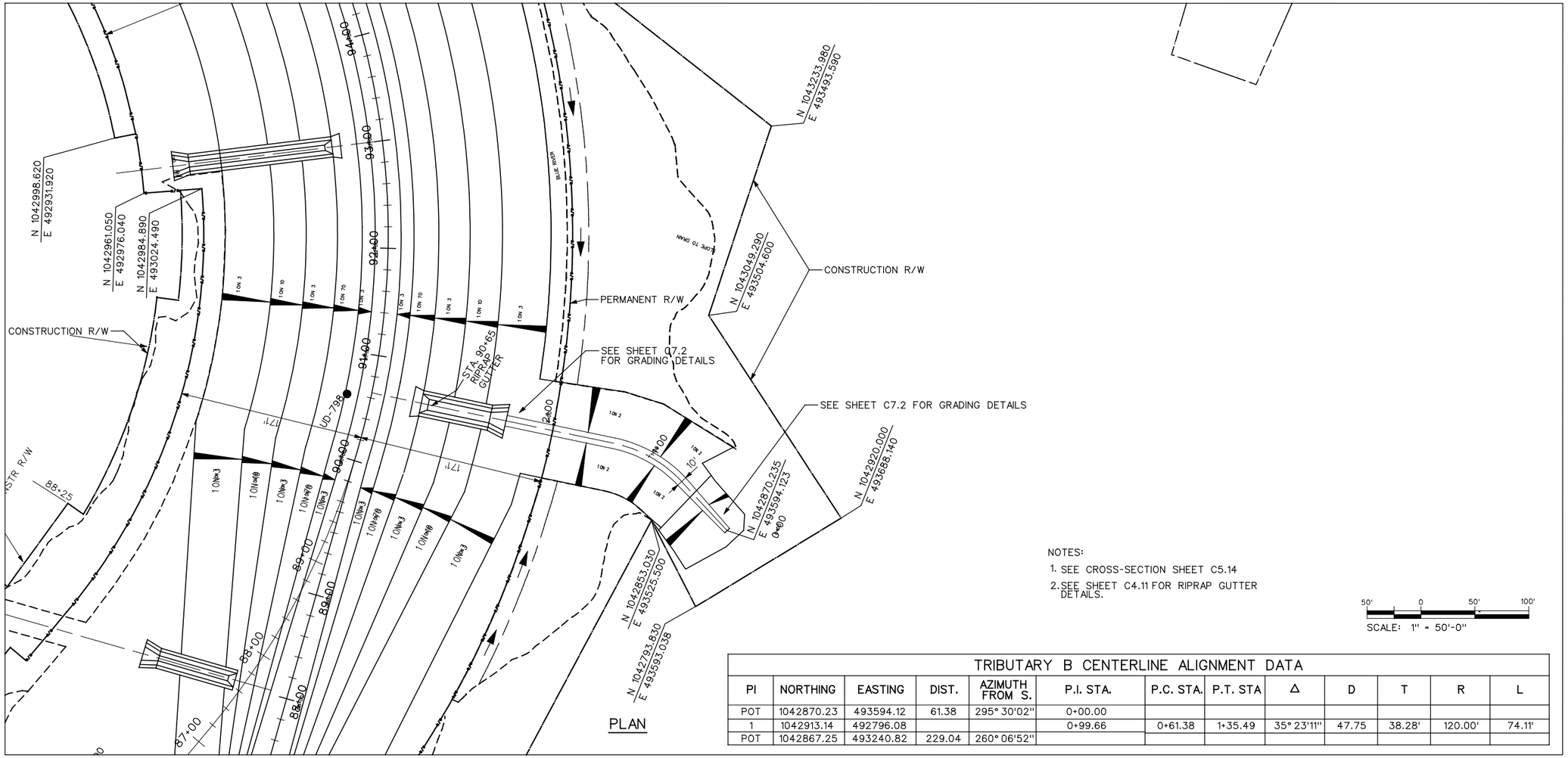
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

FILL AREA "D"

Sheet Reference Number:
C4.8



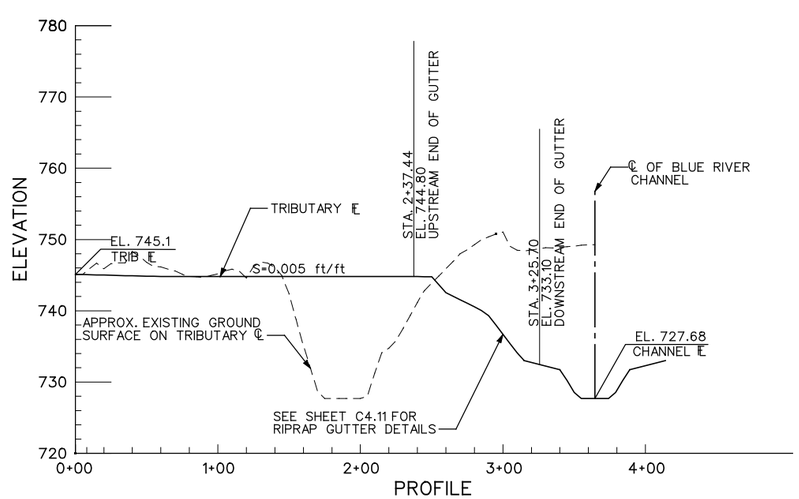
NOTES:

1. SEE CROSS-SECTION SHEET C5.14
2. SEE SHEET C4.11 FOR RIPRAP GUTTER DETAILS.

50' 0 50' 100'
SCALE: 1" = 50'-0"

TRIBUTARY B CENTERLINE ALIGNMENT DATA

PI	NORTHING	EASTING	DIST.	AZIMUTH FROM S.	P.I. STA.	P.C. STA.	P.T. STA	Δ	D	T	R	L
POT	1042870.23	493594.12	61.38	295° 30'02"	0+00.00							
1	1042913.14	492796.08			0+99.66	0+61.38	1+35.49	35° 23'11"	47.75	38.28'	120.00'	74.11'
POT	1042867.25	493240.82	229.04	260° 06'52"								



PROFILE

50 10 0 50 100
SCALE: 1" = 50'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF, RD
Date: AUGUST 2008
Drawing code:
Drawn by: SCB, JAS
Plot scale: 1" = 50'-0"
Checked by: MWJ
CADD File Name: bracd-108.dgn
Submitted by: TJK

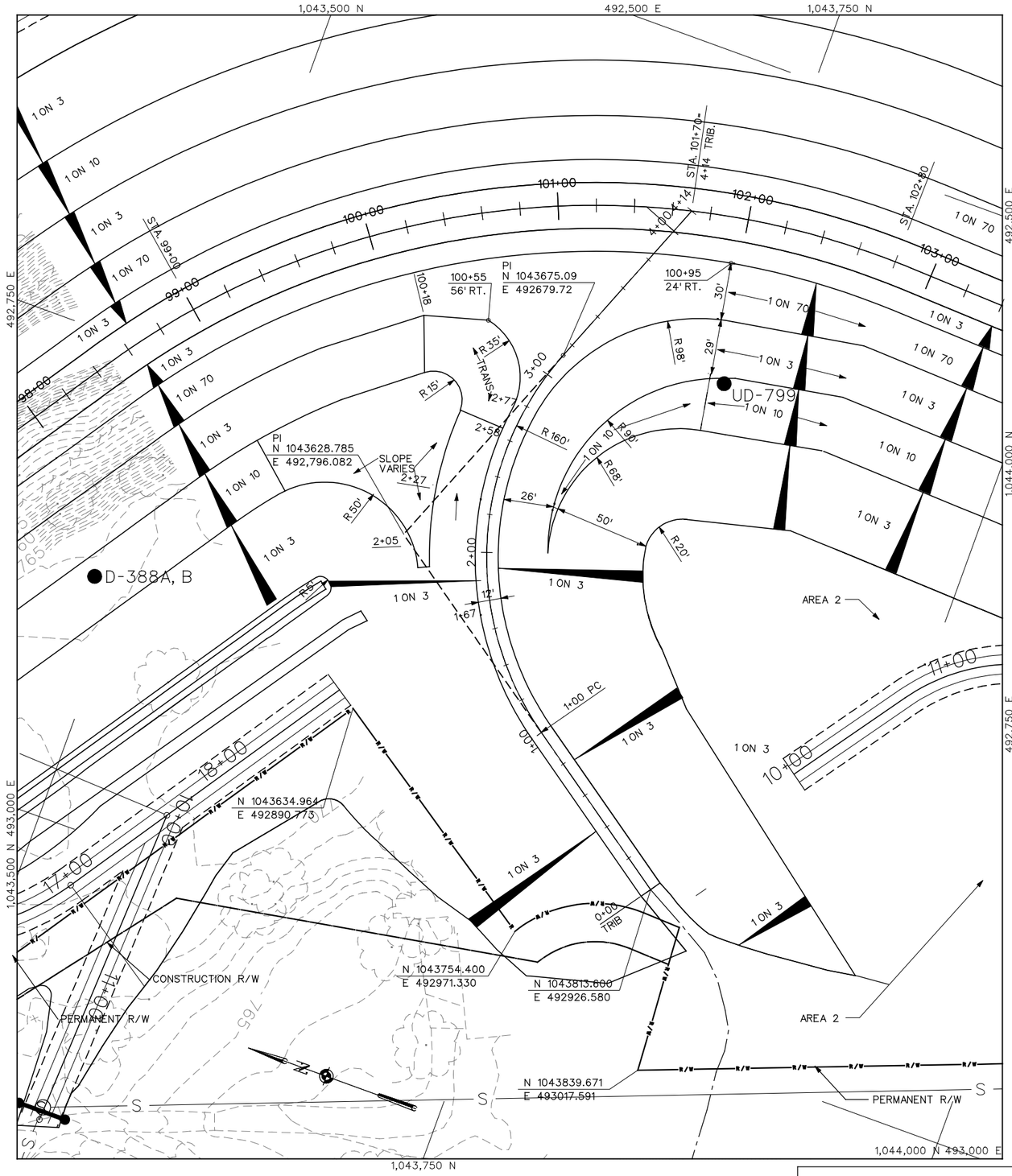
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TRIBUTARY A AT STA. 90+65
DETAILS

Sheet Reference Number:
C4.9

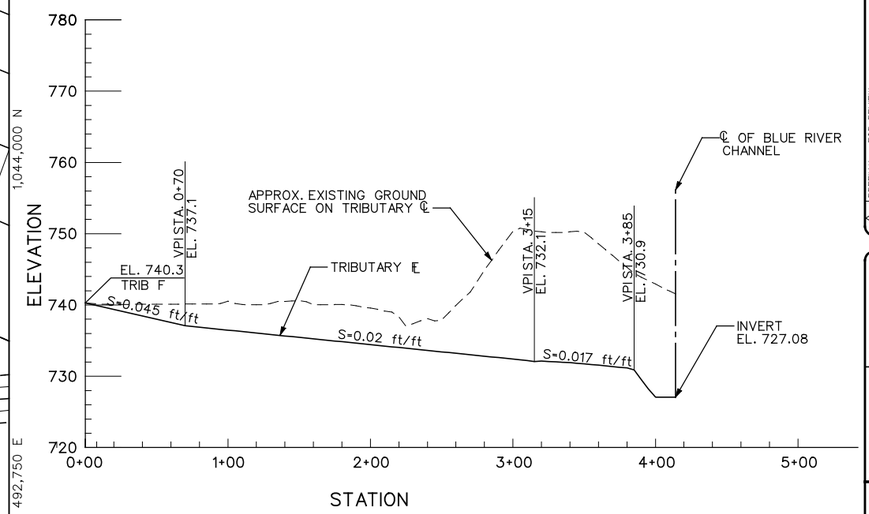


PLAN

SCALE: 1" = 30'-0"

NOTE:

1. SEE CROSS-SECTION SHEET C5.15.



SCALE: 1" = 50'-0"

TRIBUTARY B CENTERLINE ALIGNMENT DATA

PI	NORTHING	EASTING	DIST.	AZIMUTH FROM S.	P.I. STA.	P.C. STA.	P.T. STA	Δ	D	T	R	L
POT	1043813.60	492926.58	100.17	215° 13'33"	0+00.00							
1	1043628.78	492796.08			2+26.24	1+00.17	3+13.72	76° 28'25"	35.81	126.07'	160.0'	213.55'
POT	1043712.48	492585.76	100.29	291° 41'58"								

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF, RD
Drawn by: SCB, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 30'-0"
CADD File Name: brsc04-110.dgn

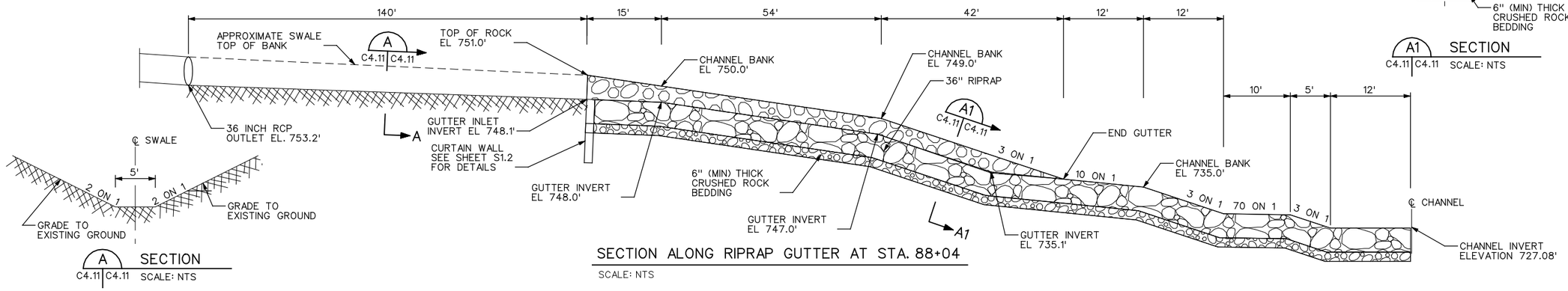
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

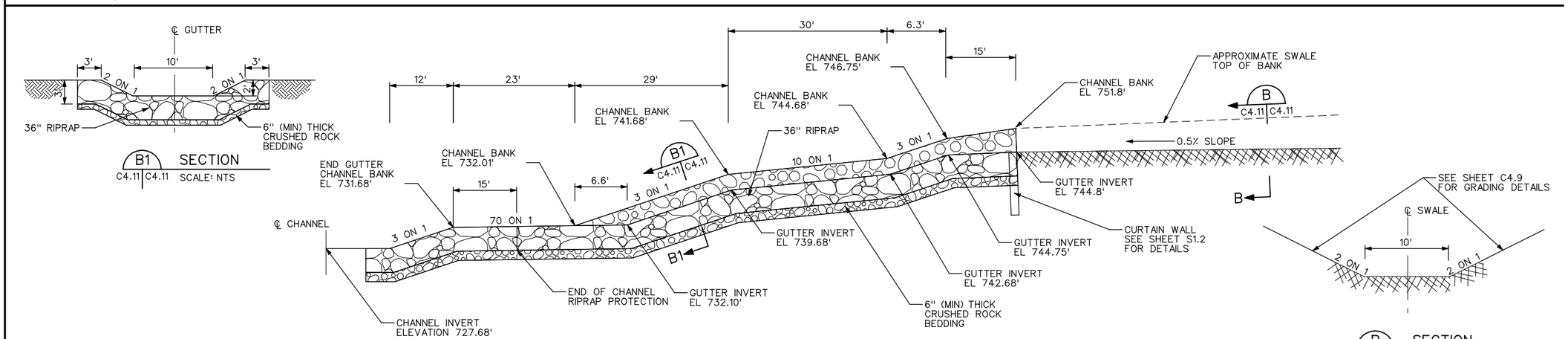
TRIBUTARY B AT STA. 101+70
ALIGNMENT, PROFILE AND
GRADING DETAILS

Sheet Reference Number:
C4.10



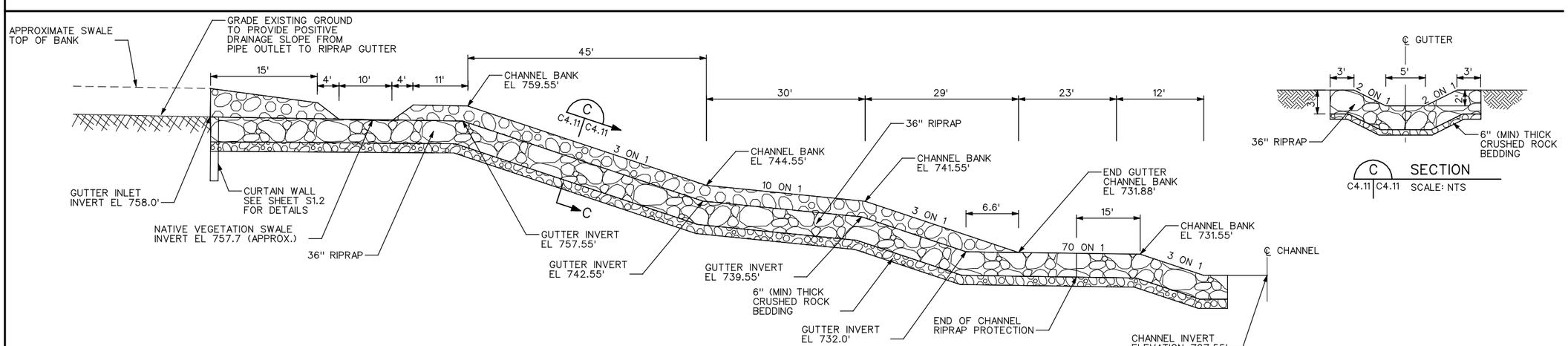
SECTION ALONG RIPRAP GUTTER AT STA. 88+04

SCALE: NTS



SECTION ALONG RIPRAP GUTTER AT STA. 90+65

SCALE: NTS



SECTION ALONG RIPRAP GUTTER AT STA. 93+00

SCALE: NTS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Date: AUGUST 2008
Drawing code:
Designed by: RD
Drawn by: RD, JAS
Plot scale: NTS
CADD File Name: bxcd-c41.dgn
Checked by: MJW
Submitted by: TJK

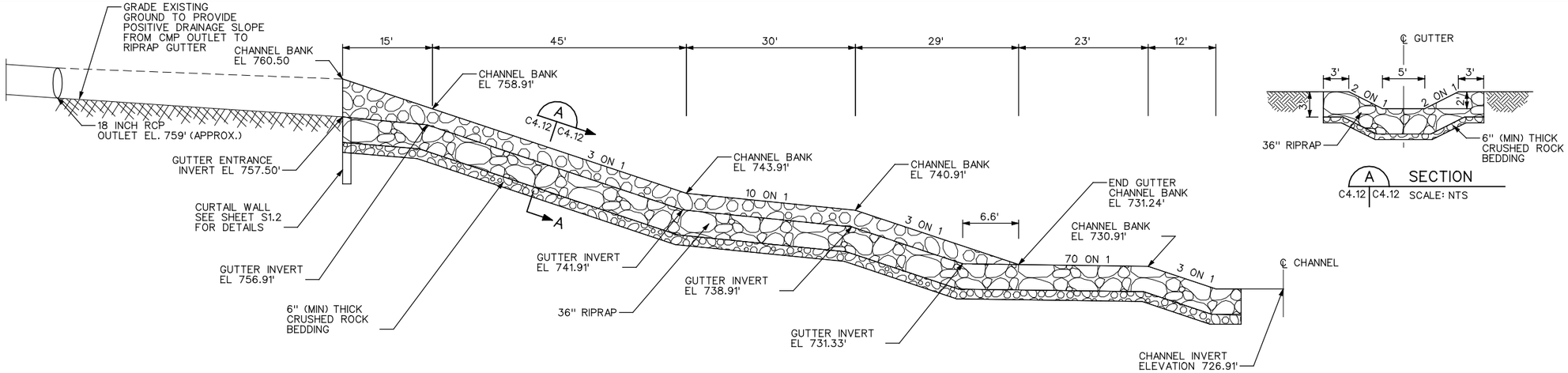
U.S. ARMY ENGINEER DISTRICT
US CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

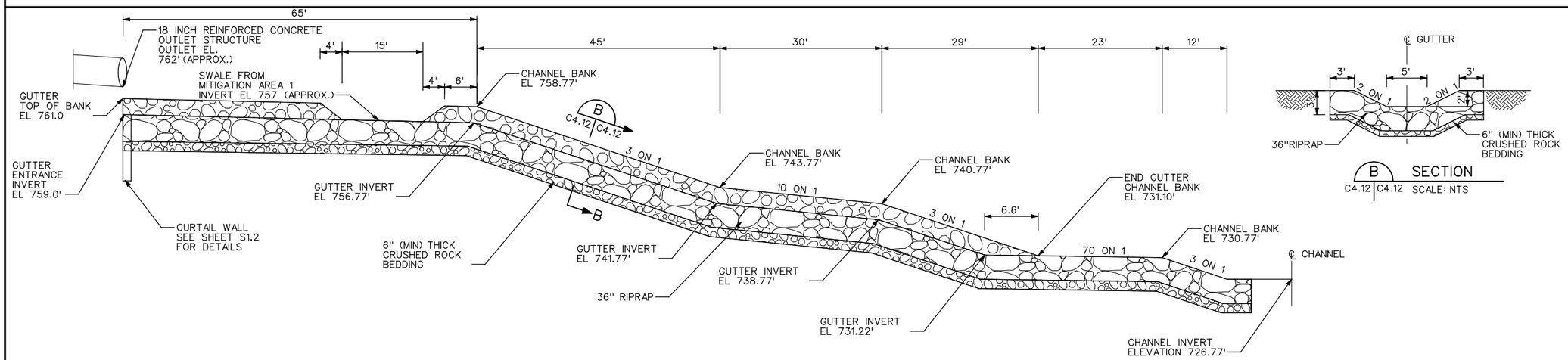
RIPRAP GUTTER DETAILS
SHEET 1

Sheet Reference Number:
C4.11



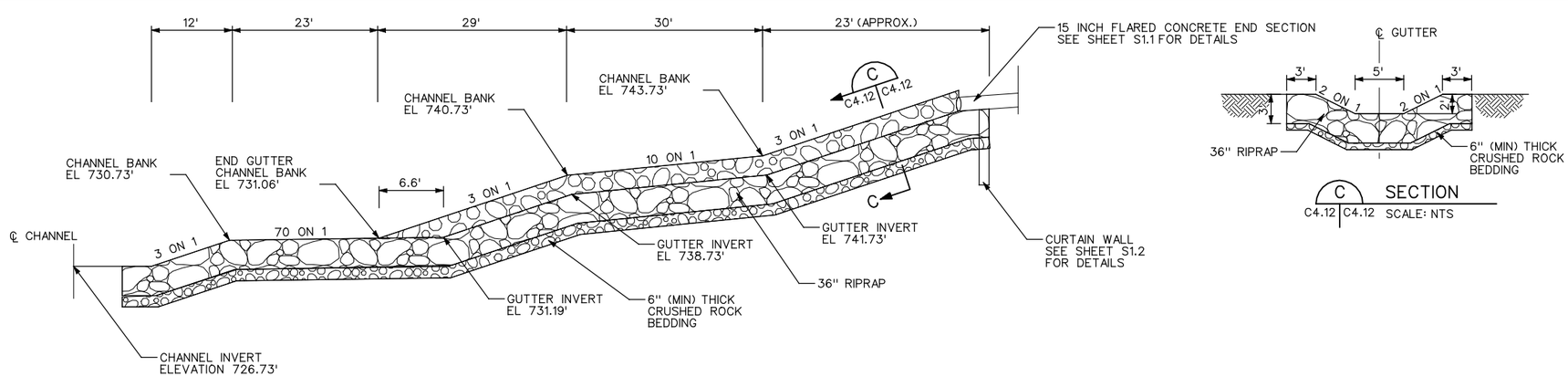
SECTION ALONG RIPRAP GUTTER AT STA. 104+60

SCALE: NTS



SECTION ALONG RIPRAP GUTTER AT STA. 107+00

SCALE: NTS



SECTION ALONG RIPRAP GUTTER AT STA. 107+72

SCALE: NTS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: RD
Date: AUGUST 2008
Drawn by: RD, JAS
Drawing code:
Checked by: MWJ
Plot scale: NTS
Submitted by: TJK
CADD File Name: bc4c0-412.dgn

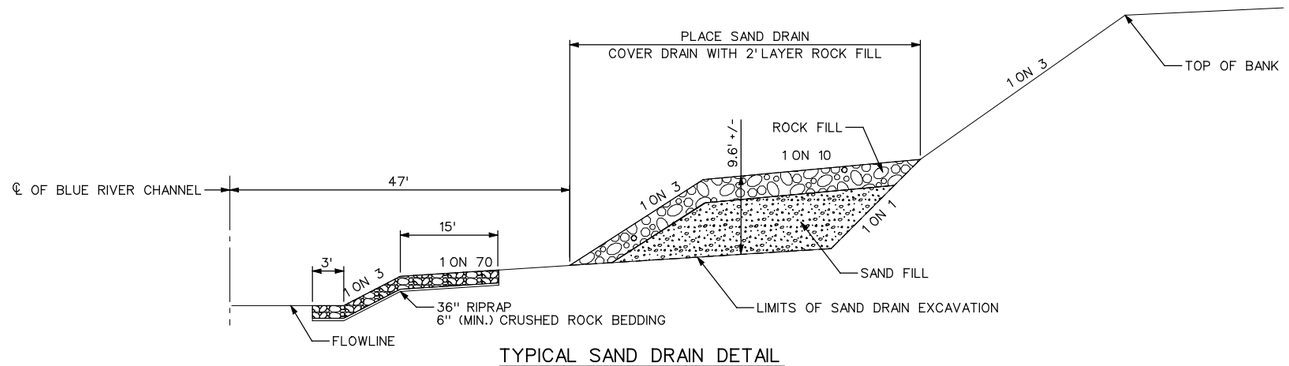
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

RIPRAP GUTTER DETAILS
SHEET 2

Sheet Reference Number:
C4.12

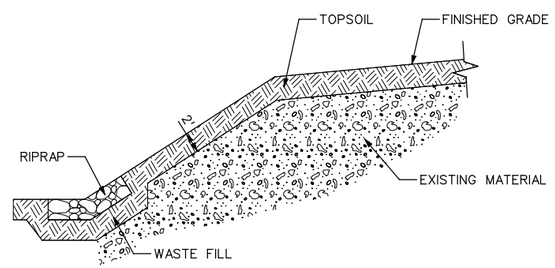


TYPICAL SAND DRAIN DETAIL

SCALE: NTS

NOTES:

1. SAND DRAINS OR AN EQUIVALENT SHALL BE LOCATED BY THE GEOTECHNICAL ENGINEER, WITHIN THE PROJECT LIMITS.
2. SAND DRAINS SHALL BE CONSTRUCTED A MINIMUM OF 2' WIDE, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.



OVEREXCAVATION DETAIL

SCALE: NTS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINAL - FOR REVIEW	08/06/08	

Designed by: GVR
Drawn by: JAS
Checked by: TJK
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: NTS
CADD File Name: brsc04-15.dgn

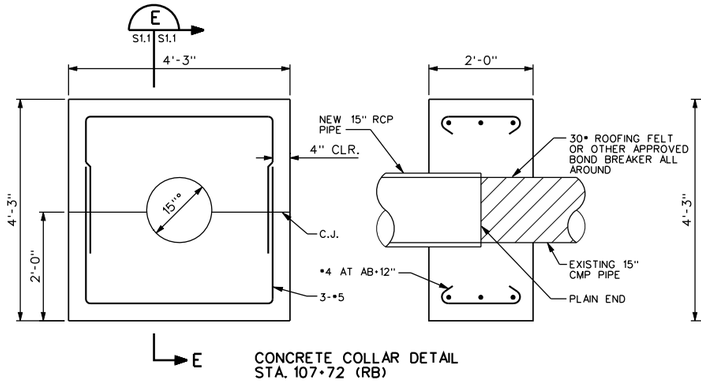
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI
CORPS OF ENGINEERS

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

SAND DRAIN DETAIL

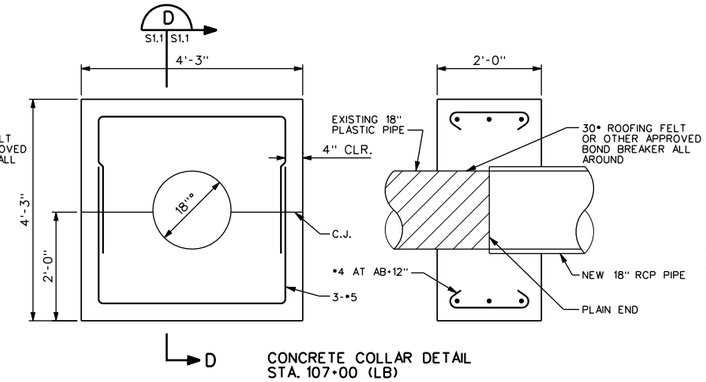
Sheet Reference Number:
C4.13



CONCRETE COLLAR DETAIL
STA. 107+72 (RB)

D ELEVATION
S1.1 S1.1 SCALE: ¾"=1'-0"

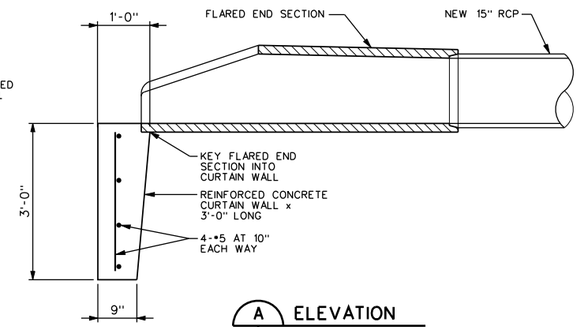
E-E SECTION
S1.1 S1.1 SCALE: ¾"=1'-0"



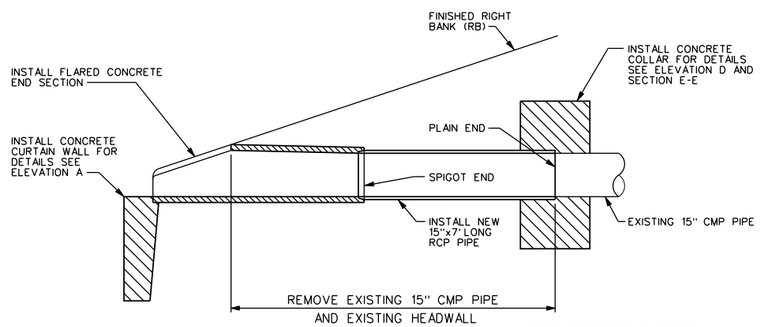
CONCRETE COLLAR DETAIL
STA. 107+00 (LB)

C ELEVATION
S1.1 S1.1 SCALE: ¾"=1'-0"

D-D SECTION
S1.1 S1.1 SCALE: ¾"=1'-0"



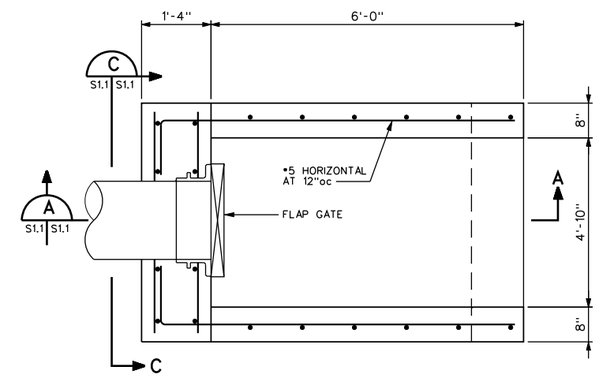
A ELEVATION
S1.1 S1.1 SCALE: ¾"=1'-0"



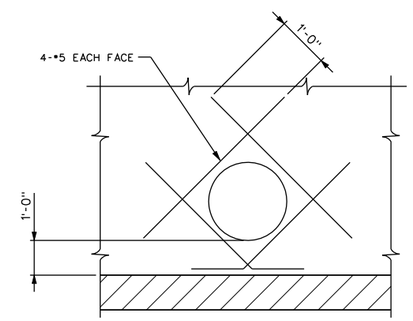
STA. 107+72 (RB)

NOTE: REINFORCED CONCRETE PIPE TO BE ASTM C76, CLASS III, WALL B

E ELEVATION
S1.1 S1.1 SCALE: ½"=1'-0"

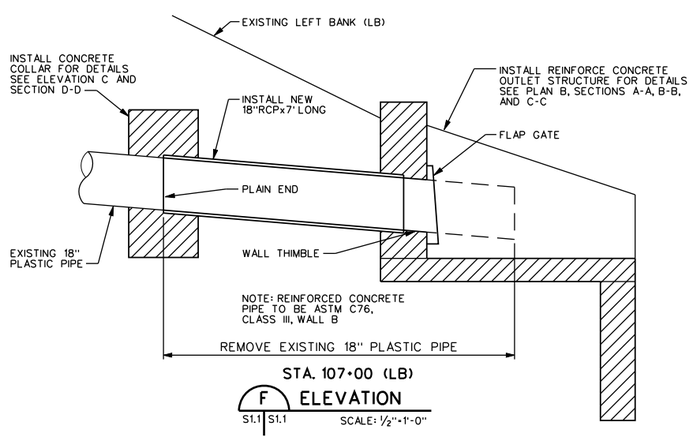


B PLAN
S1.1 S1.1 SCALE: ¾"=1'-0"



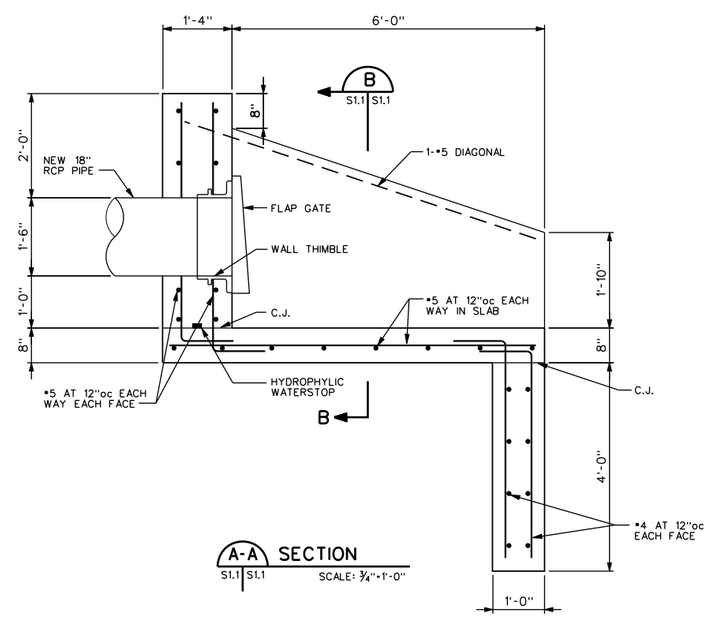
NOTE: ONLY DIAGONAL REINFORCING AT OPENING SHOWN FOR OTHER REINFORCING SEE PLAN AND SECTION A-A

C-C SECTION
S1.1 S1.1 SCALE: ¾"=1'-0"



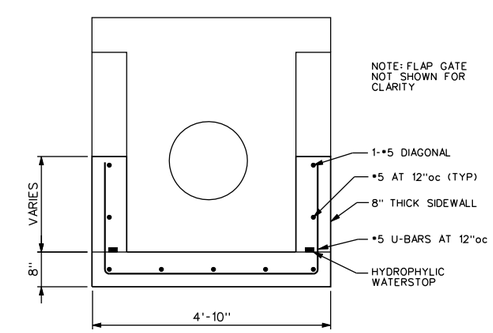
STA. 107+00 (LB)

F ELEVATION
S1.1 S1.1 SCALE: ½"=1'-0"



A-A SECTION
S1.1 S1.1 SCALE: ¾"=1'-0"

NOTE: FLAP GATE NOT SHOWN FOR CLARITY



B-B SECTION
S1.1 S1.1 SCALE: ¾"=1'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	07/31/08	

Designed by: WFS
Date: JULY 2008
Drawn by: WWP
Drawing code:
Checked by:
Plot scale:
Submitted by:
CADD File Name:

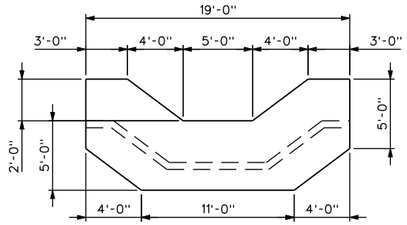
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Burns & McDonnell
HDR Engineering, Inc.

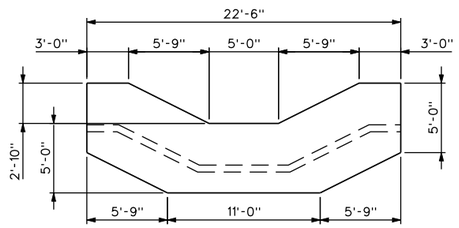
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

MODIFY STORM DRAIN OUTLET ENDS
STA.107+00(LB) & STA.107+72(RB)

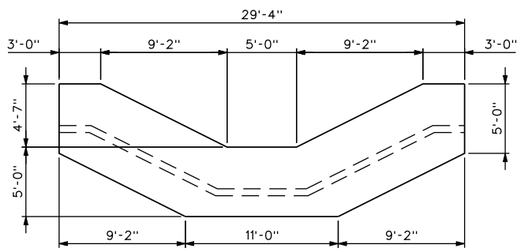
Sheet Reference Number:
S1.1



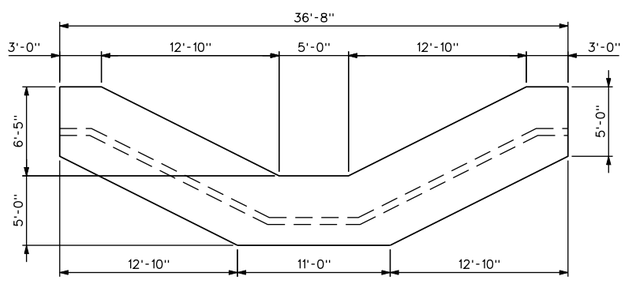
STA. 107+00(LB)
STA. 107+72(RB)



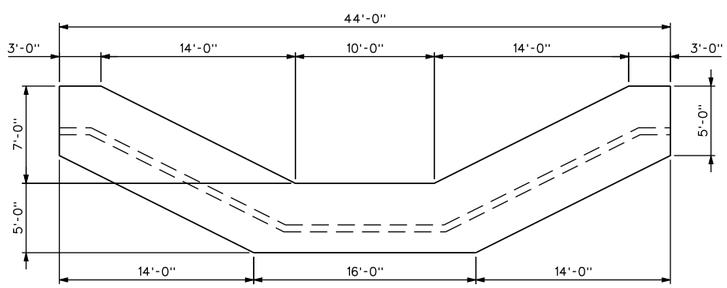
STA. 87+77(LB)



STA. 93+00(LB)

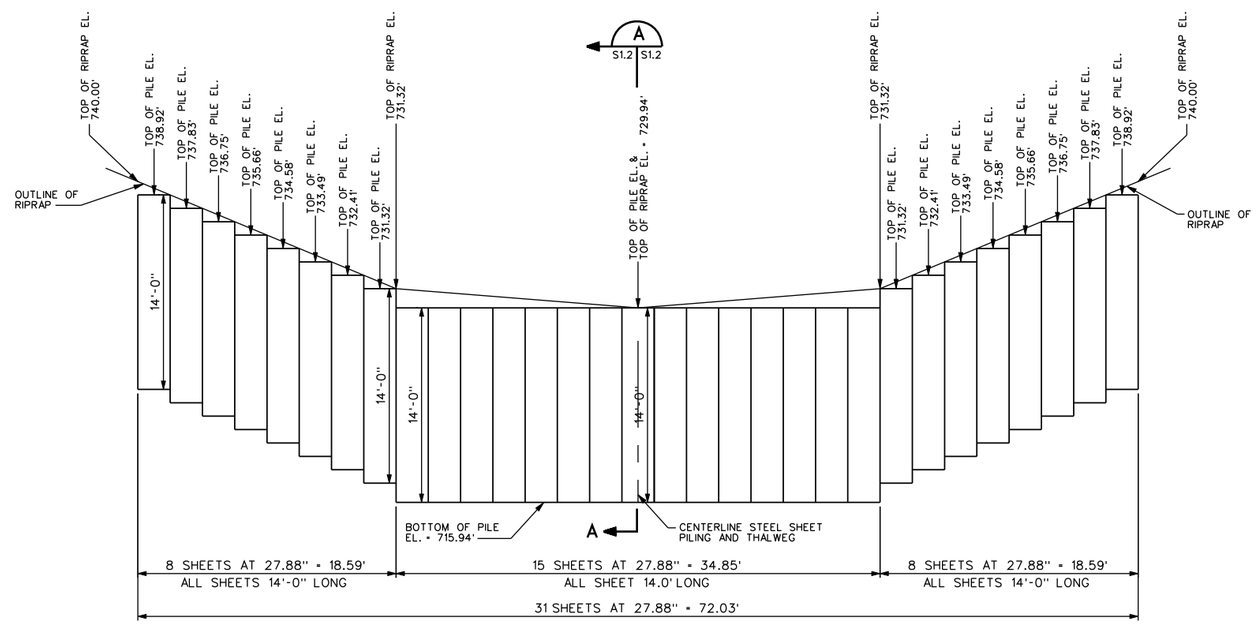


STA. 104+60(LB)

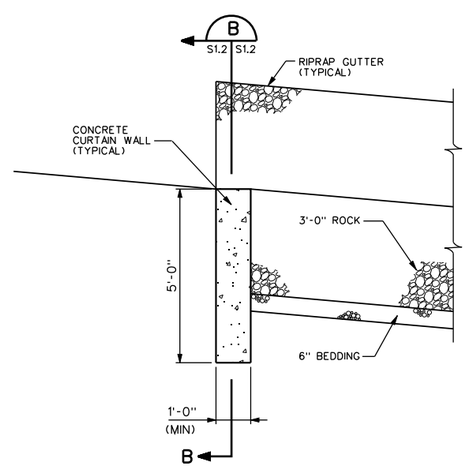


STA. 90+65(LB)

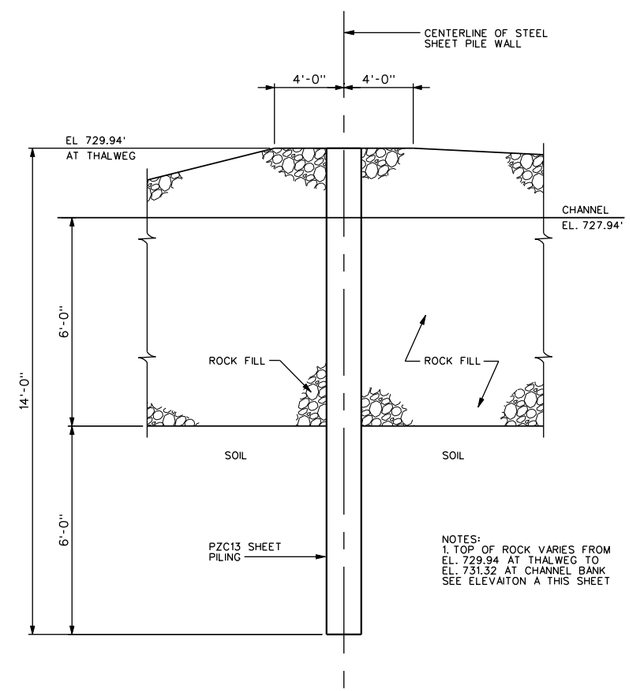
B-B RIPRAP GUTTER CURTAIN WALLS
S1.2 | S1.2 SCALE: 1"=5'-0"



A ELEVATION OF TEMPORARY GRADE CONTROL STRUCTURE OF STEEL SHEET PILING
S1.2 | S1.2 SCALE: 1"=5'-0"



B SECTION
S1.2 | S1.2 SCALE: ½"=1'-0"



NOTES:
1. TOP OF ROCK VARIES FROM EL. 729.94 AT THALWEG TO EL. 731.32 AT CHANNEL BANK SEE ELEVAITON A THIS SHEET

A-A SECTION
S1.2 | S1.2 SCALE: ½"=1'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	07/31/08	

Designed by: WFS
Date: JULY 2008
Drawn by: WWP
Drawing code:
Checked by:
Plot scale:
Submitted by:
CADD File Name:

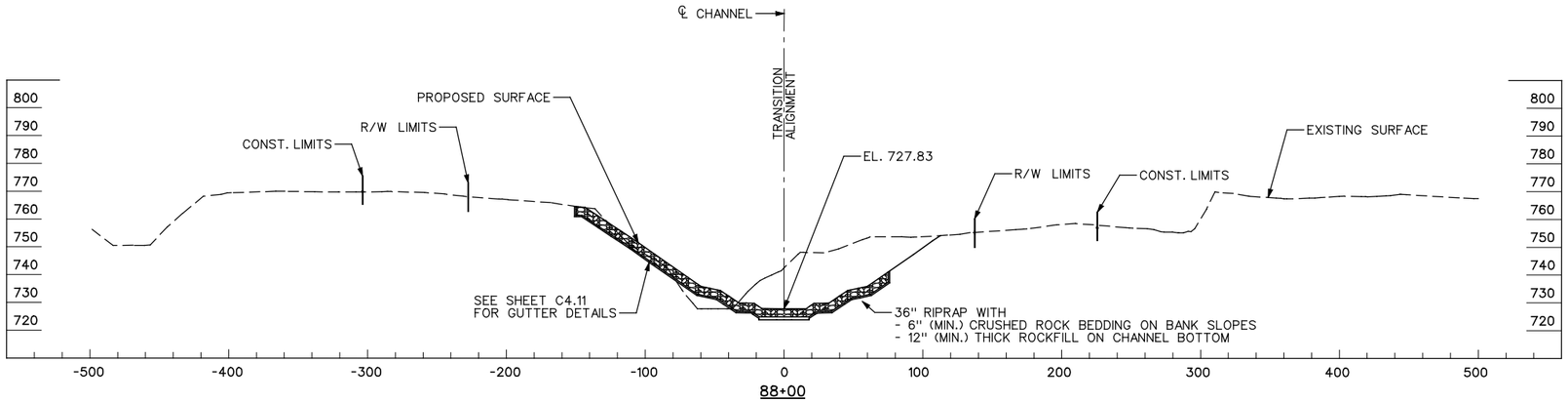
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.
Naeve & Associates

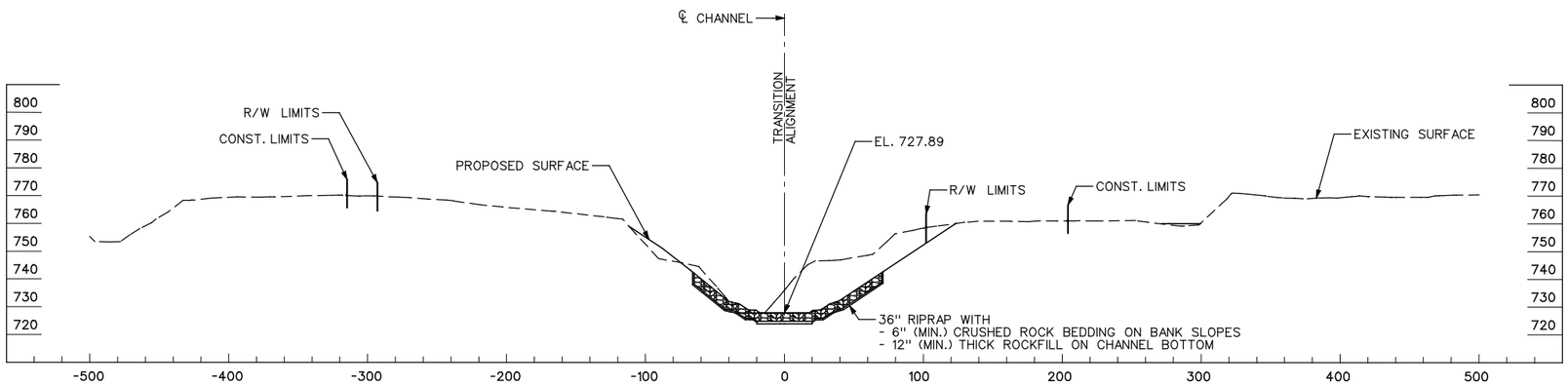
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TEMP. GRADE CONTROL STRUCTURE
STEEL SHEET PILING STA.86+00
RIPRAP GUTTER CURTAIN WALLS

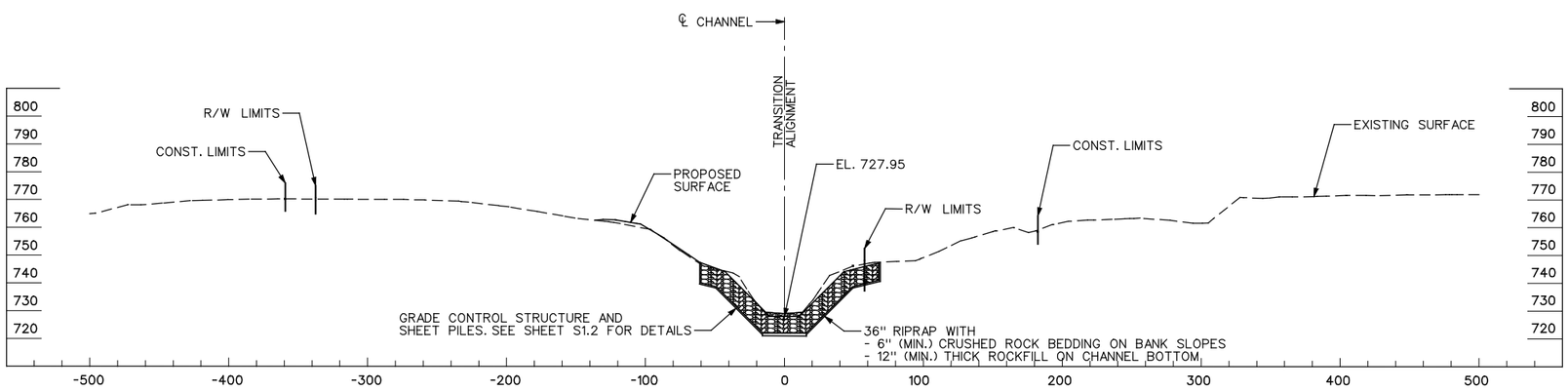
Sheet Reference Number:
S1.2



88+00



87+00



86+00

NOTE:
ROCKFILL TO BE USED IN LIEU OF BEDDING UNDER WATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS01D1.DGN

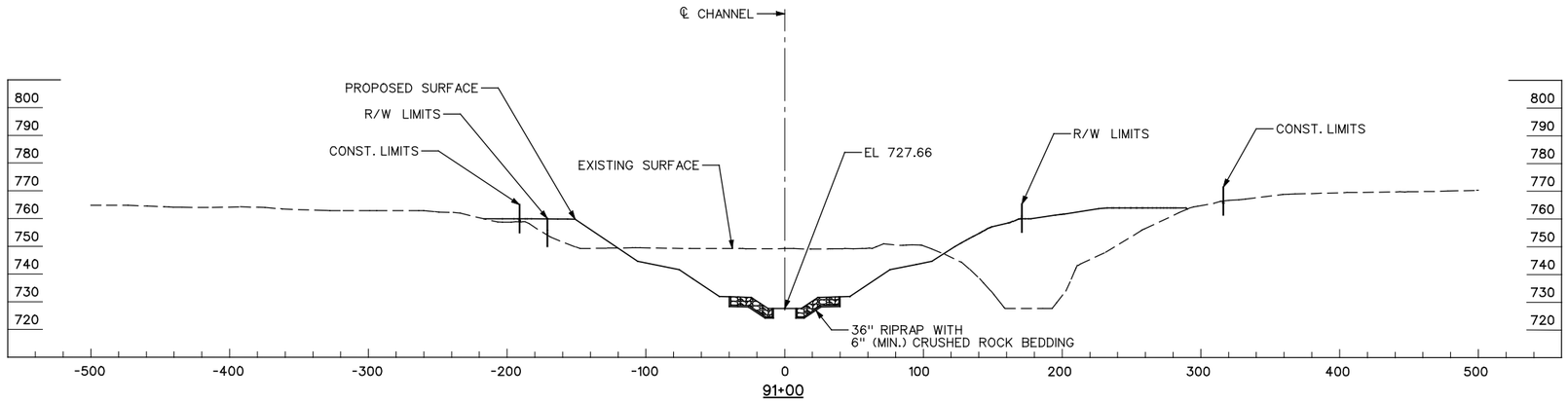
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

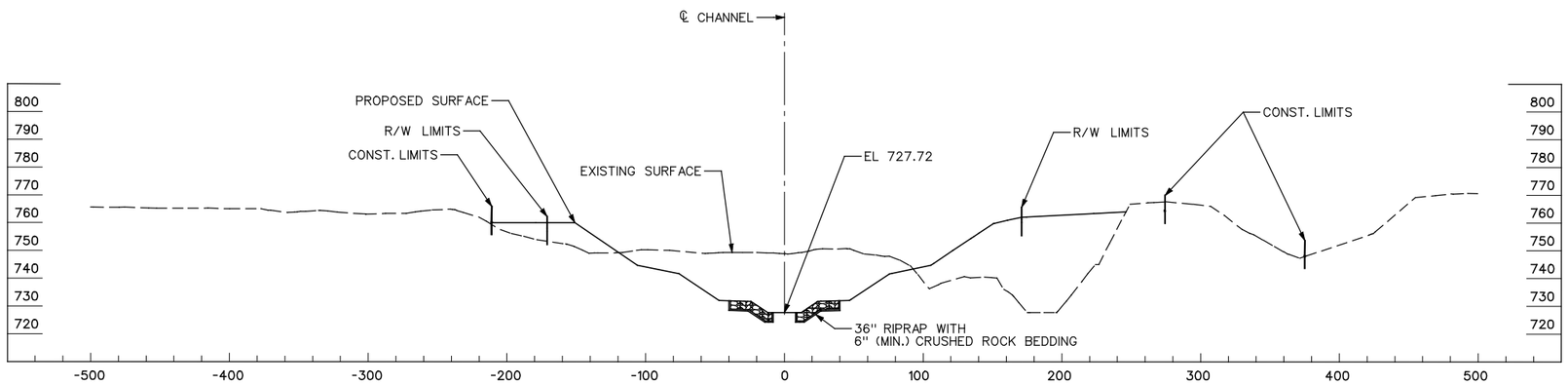
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 1

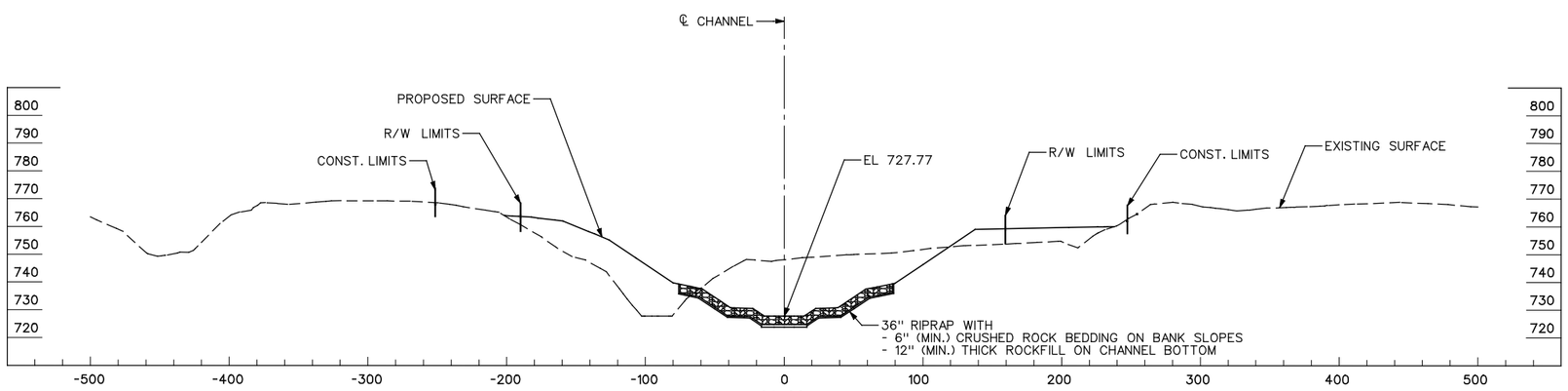
Sheet Reference Number:
C5.1



91+00

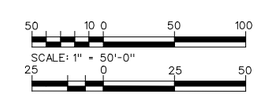


90+00 AHEAD
90+30 BACK CHANNEL TRANSITION



89+00

NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDER WATER.



US Army Corps
of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS0102.DGN

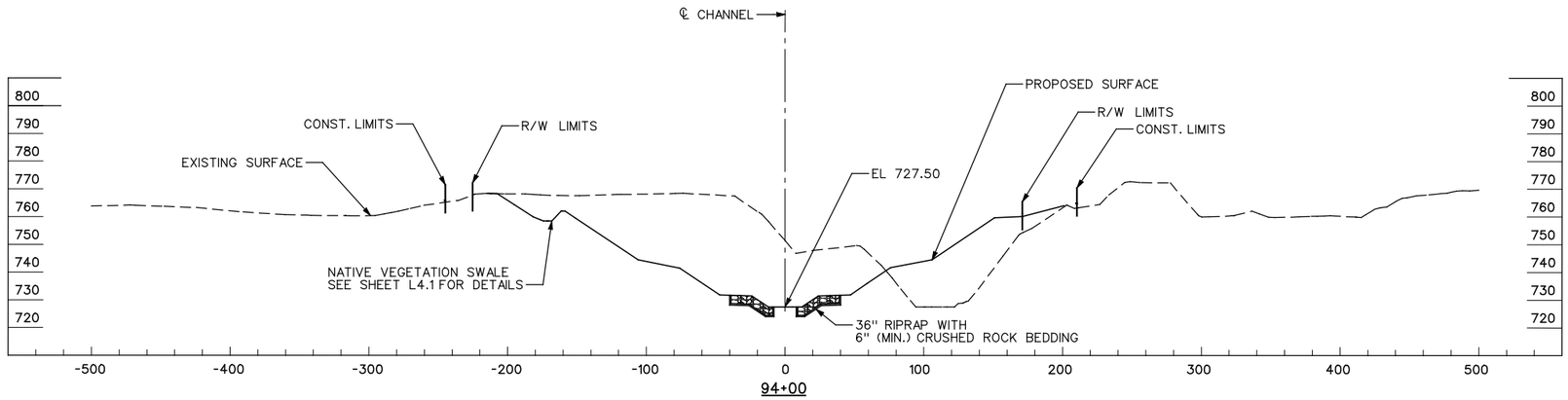
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

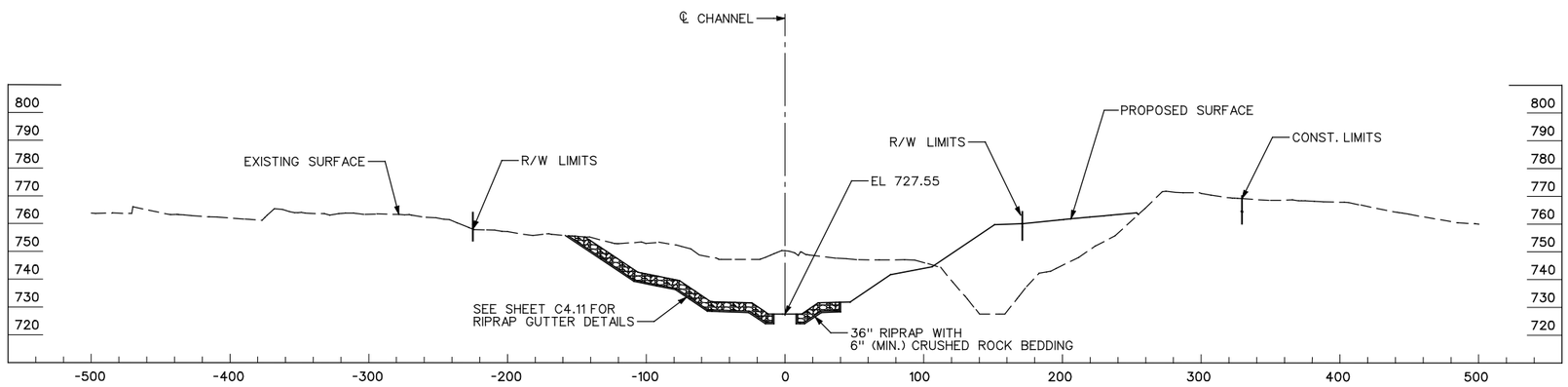
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 2

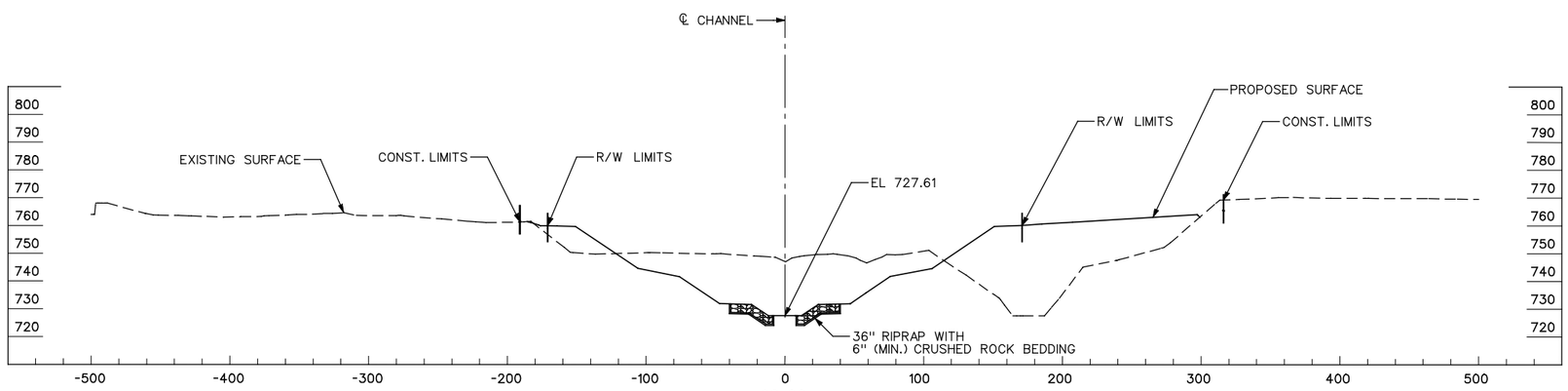
Sheet Reference Number:
C5.2



94+00



93+00



92+00

NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.

SCALE: 1" = 50'-0"

SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Drawn by: MLW, JAS
Checked by: WWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRKS03.DGN

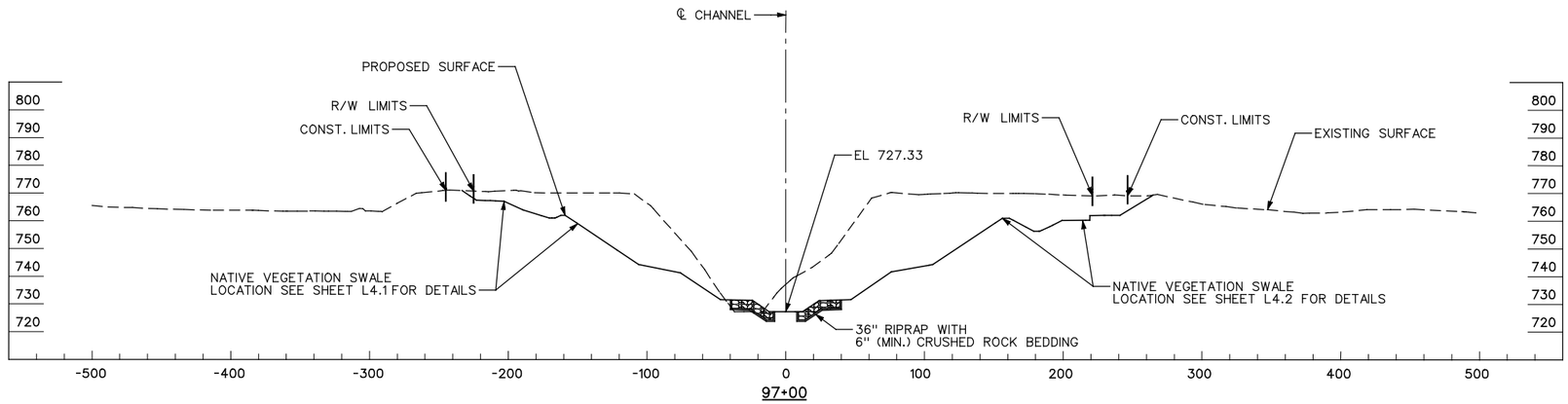
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

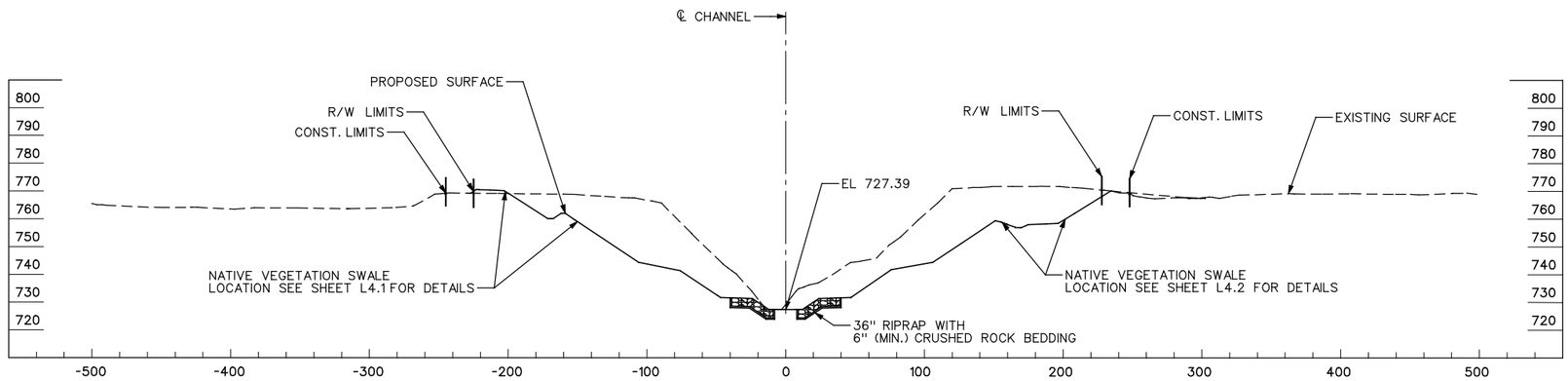
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 3

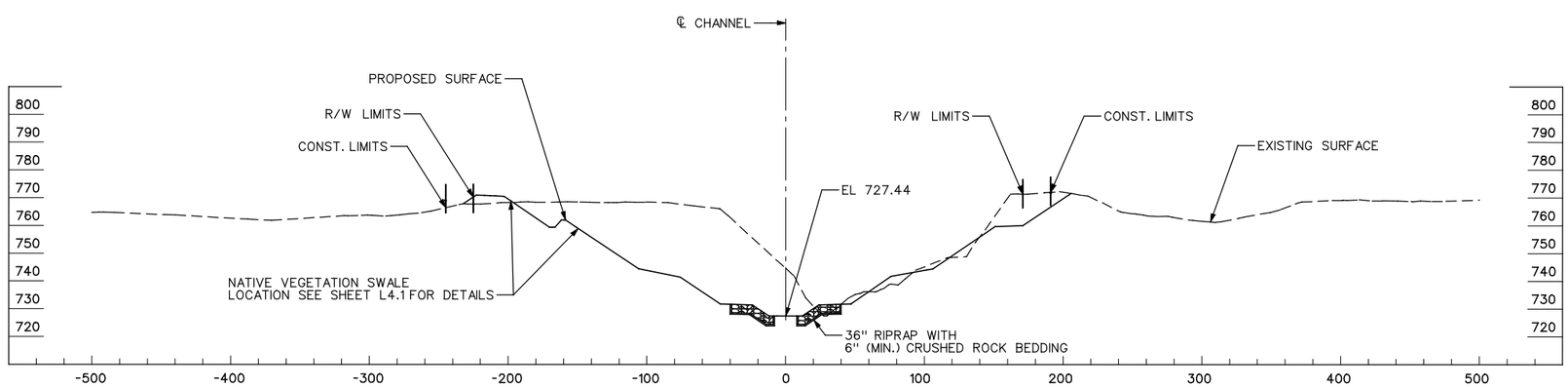
Sheet Reference Number:
C5.3



97+00

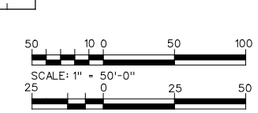


96+00



95+00

NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRK50T04.DGN

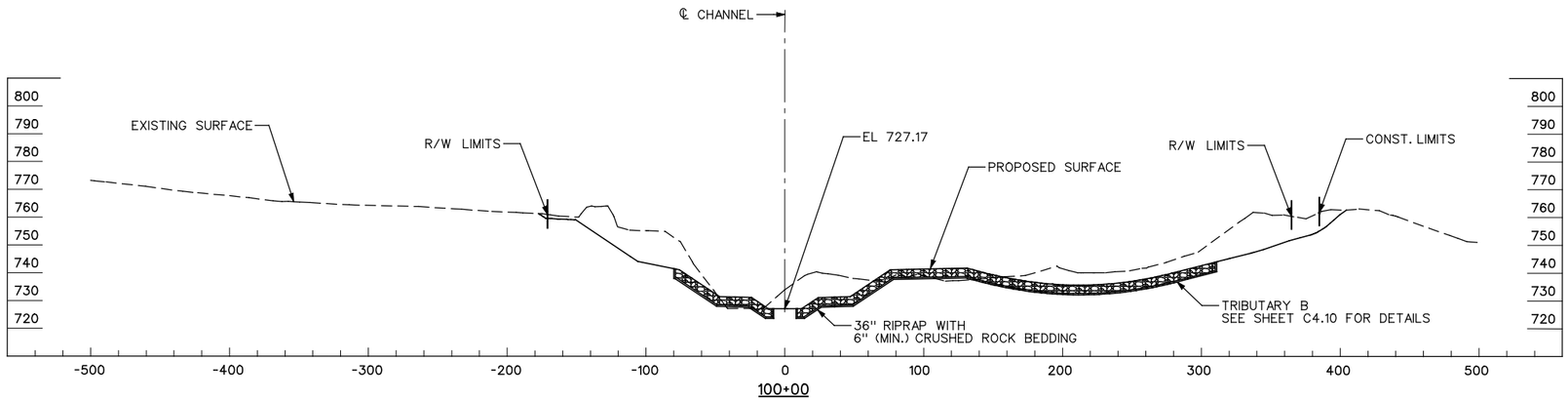
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

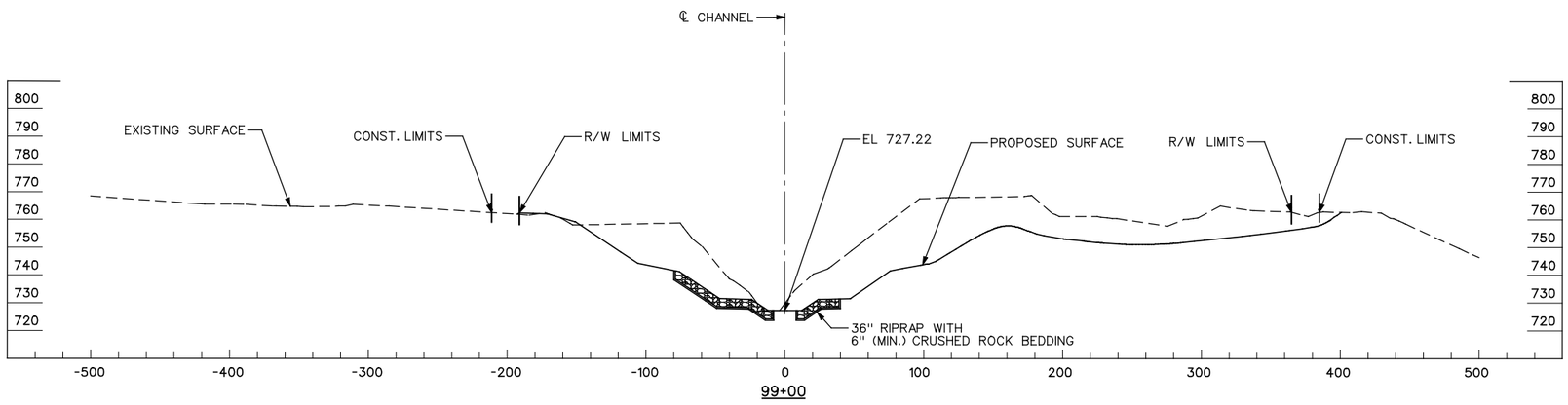
HDR Engineering, Inc.

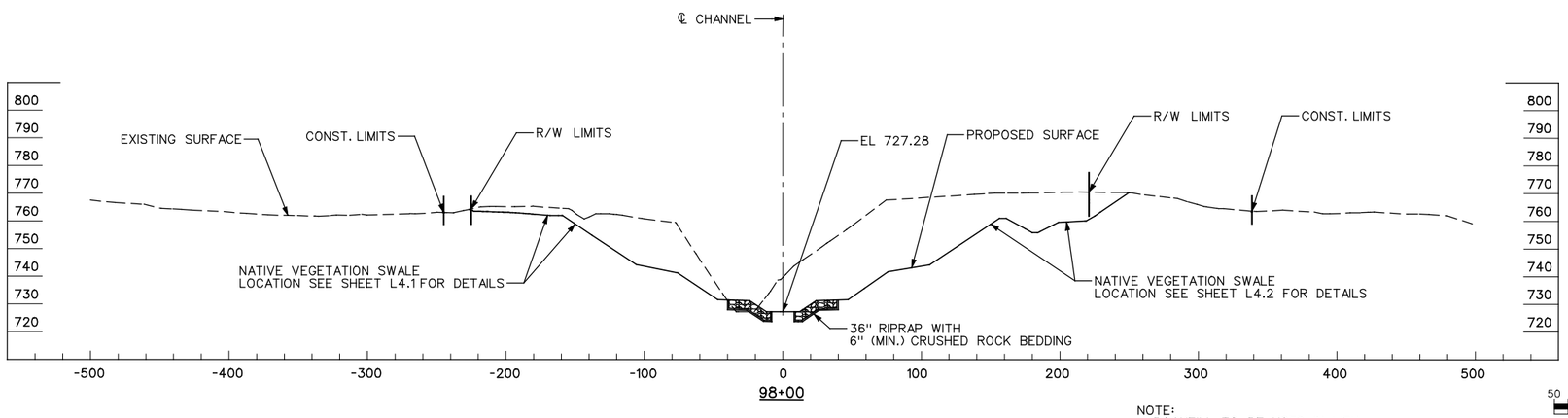
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 4

Sheet Reference Number:
C5.4







NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS0105.DGN

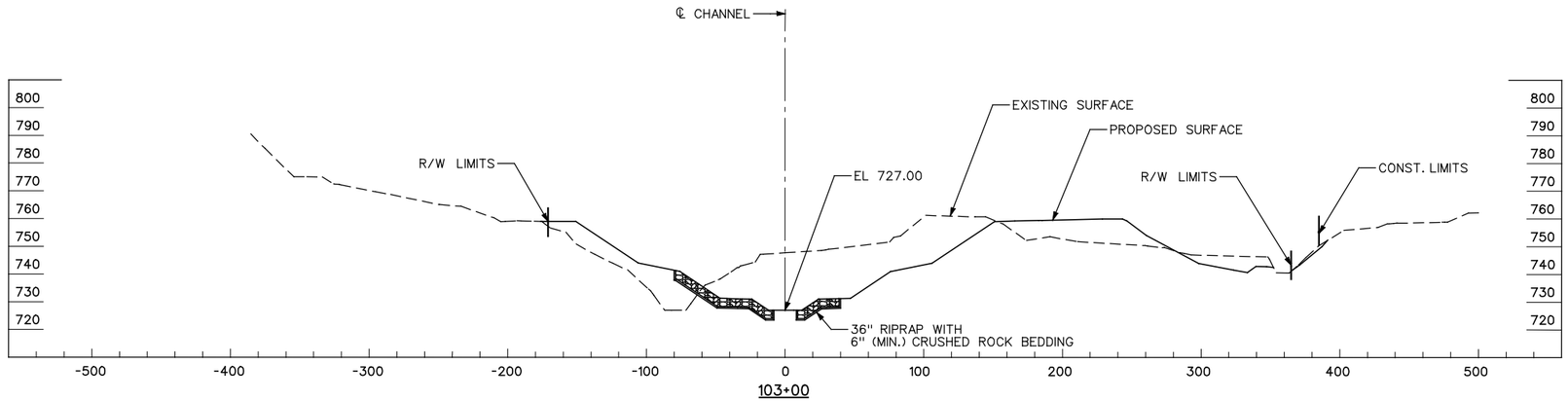
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

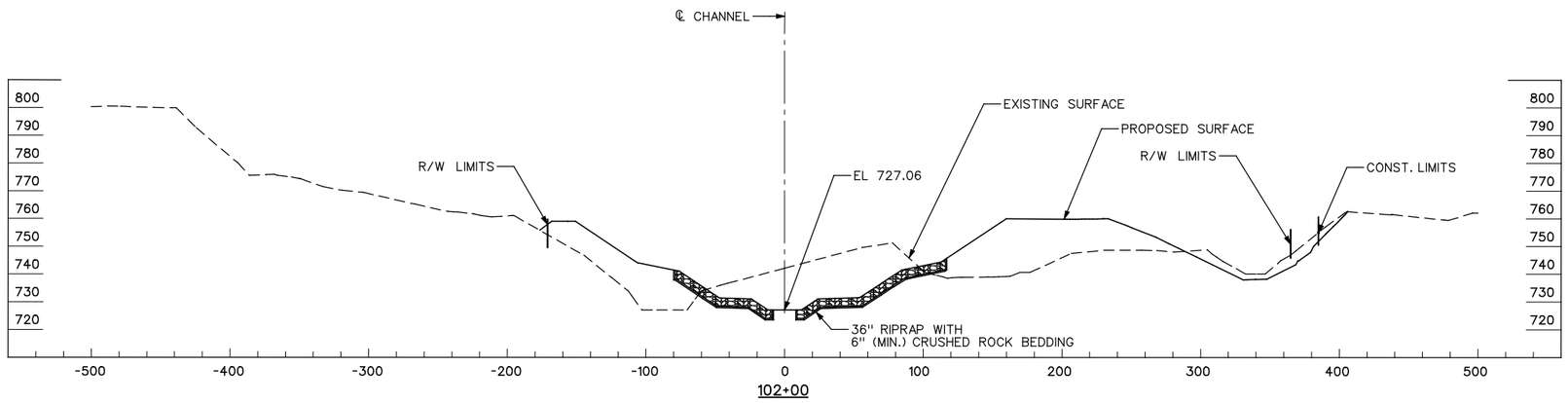
HDR
HDR Engineering, Inc.

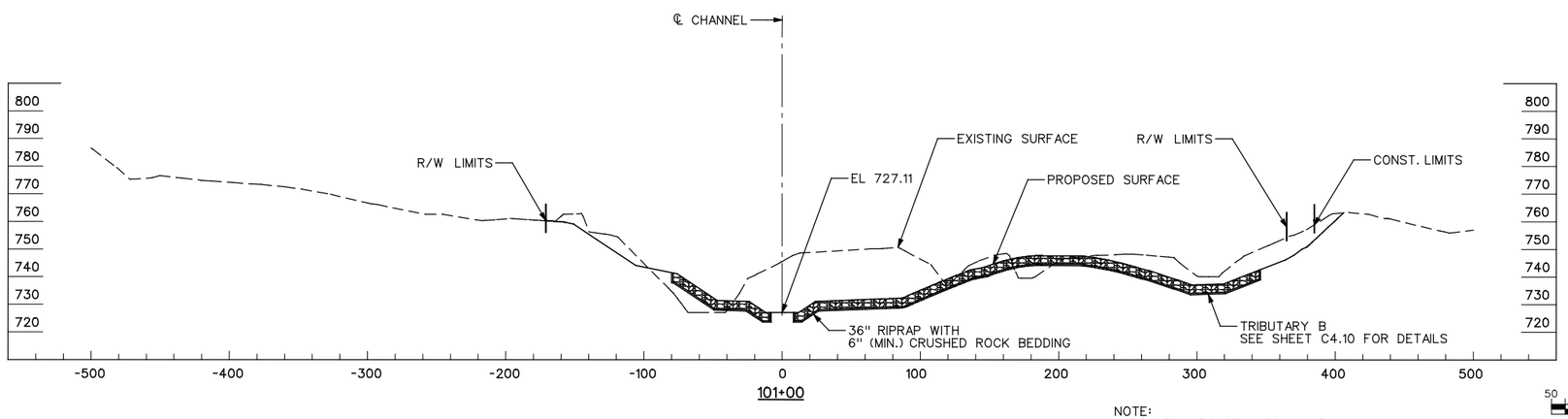
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 5

Sheet Reference Number:
C5.5







NOTE:
ROCKFILL TO BE USED IN LIEU
OF ROCK BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: WWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS0106.DGN

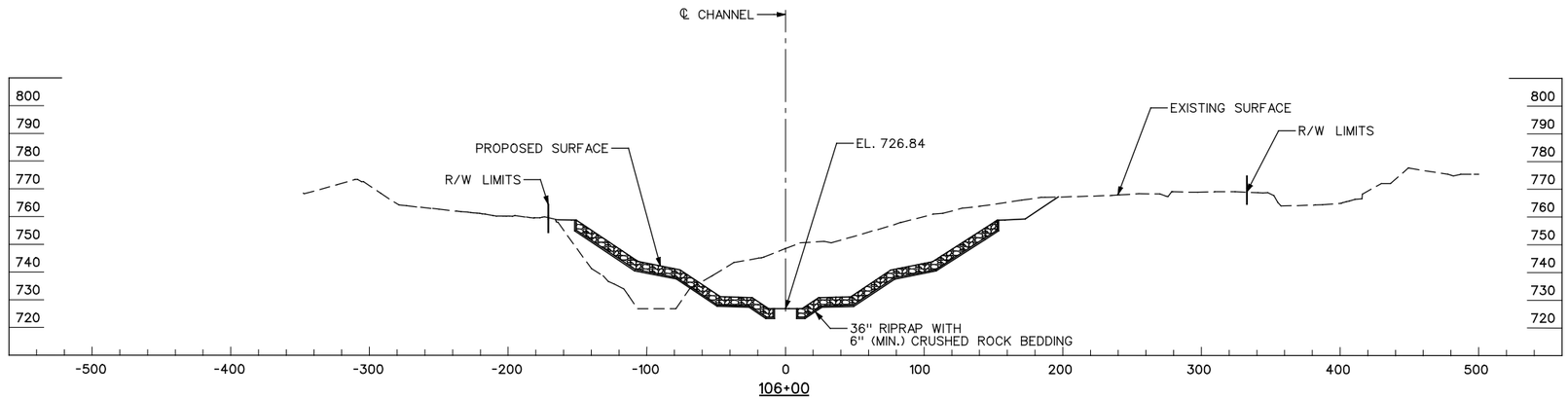
U.S. ARMY ENGINEER DISTRICT
ACORPS OF ENGINEERS
KANSAS CITY, MISSOURI

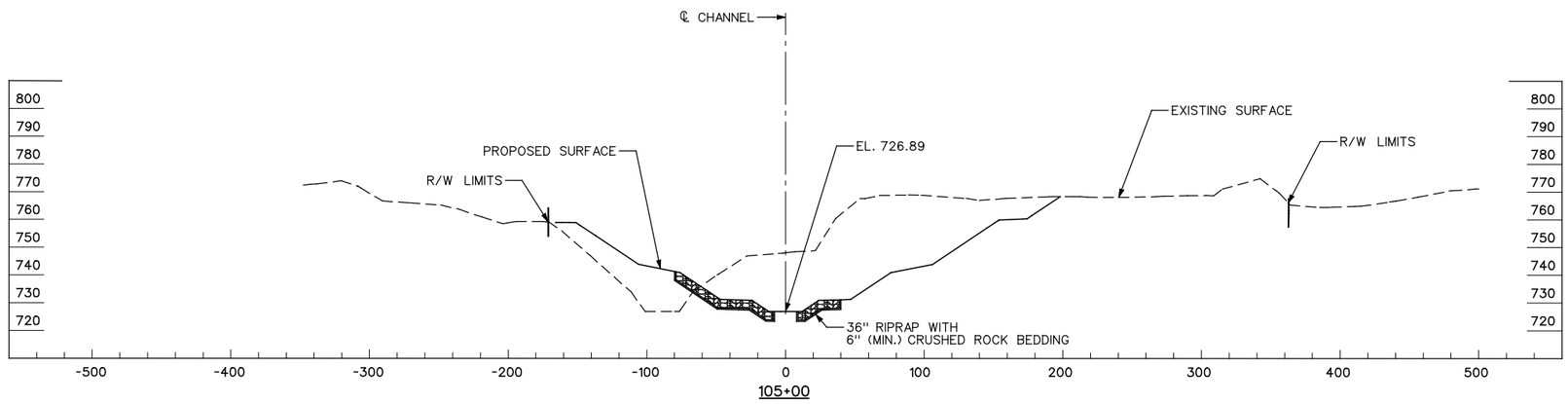
HDR
HDR Engineering, Inc.

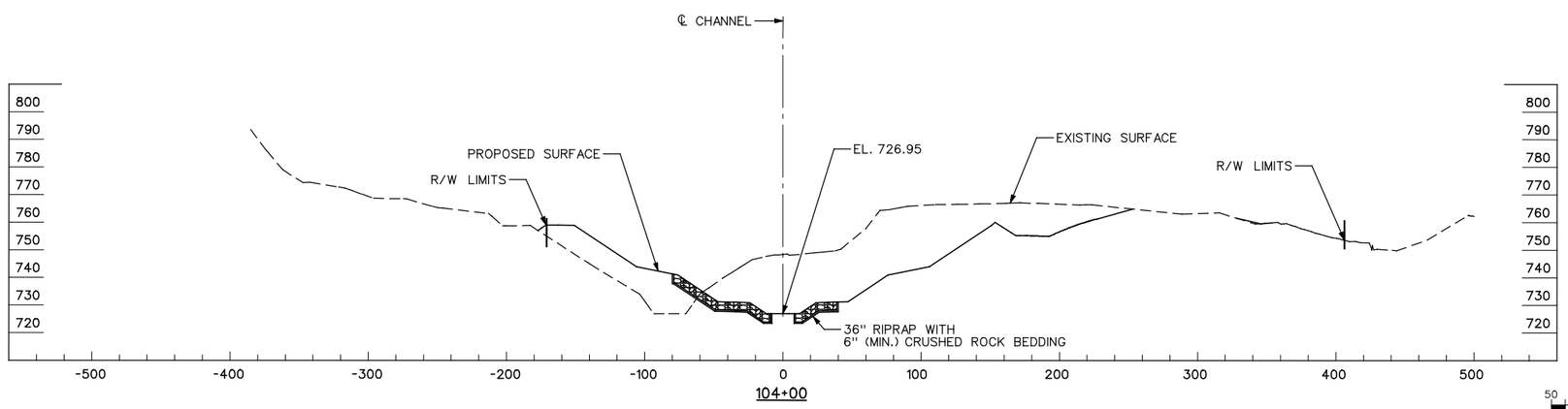
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 6

Sheet Reference Number:
C5.6







NOTE:
ROCKFILL TO USED IN LIEU
OF BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: WWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS107.DGN

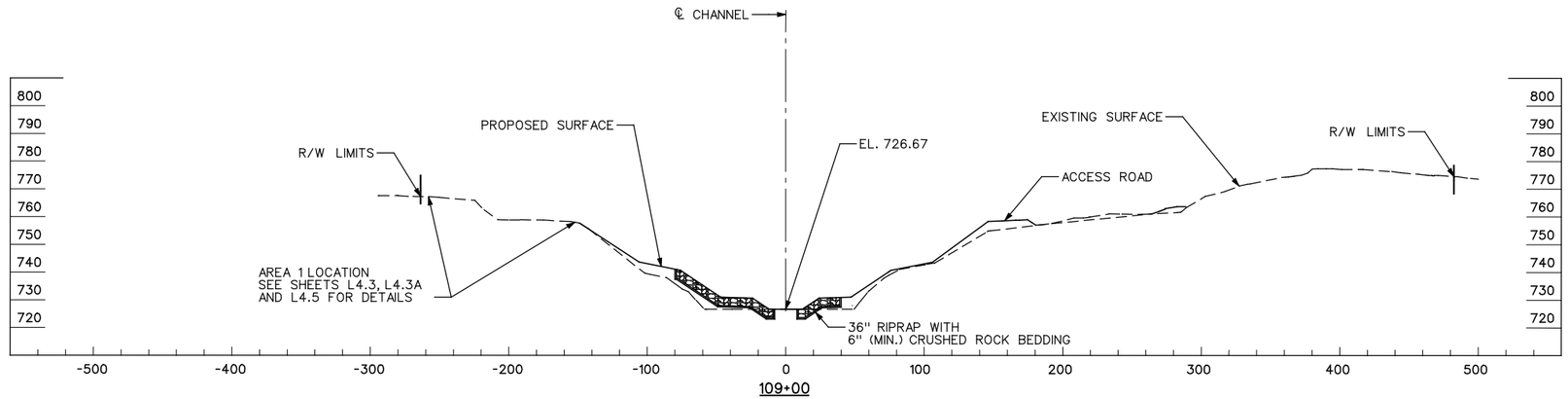
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

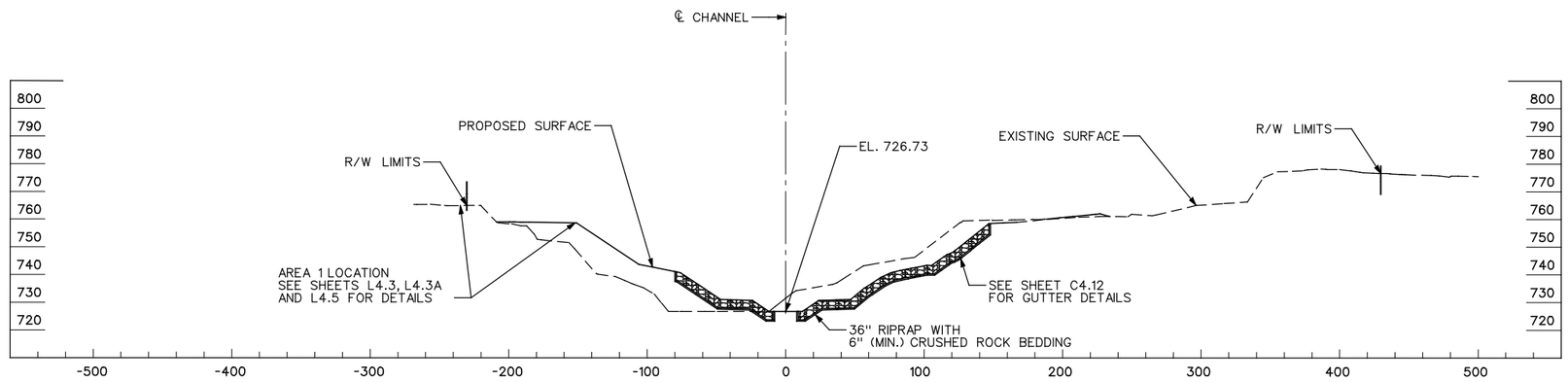
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 7

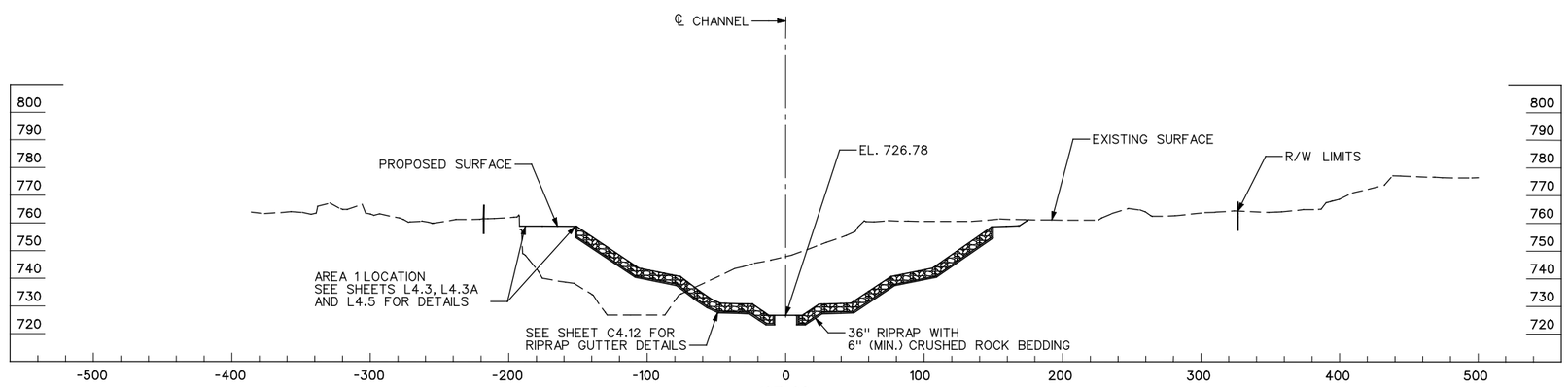
Sheet Reference Number:
C5.7



109+00

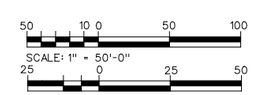


108+00



107+00

NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.



US Army Corps
of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: WWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS01B.DGN

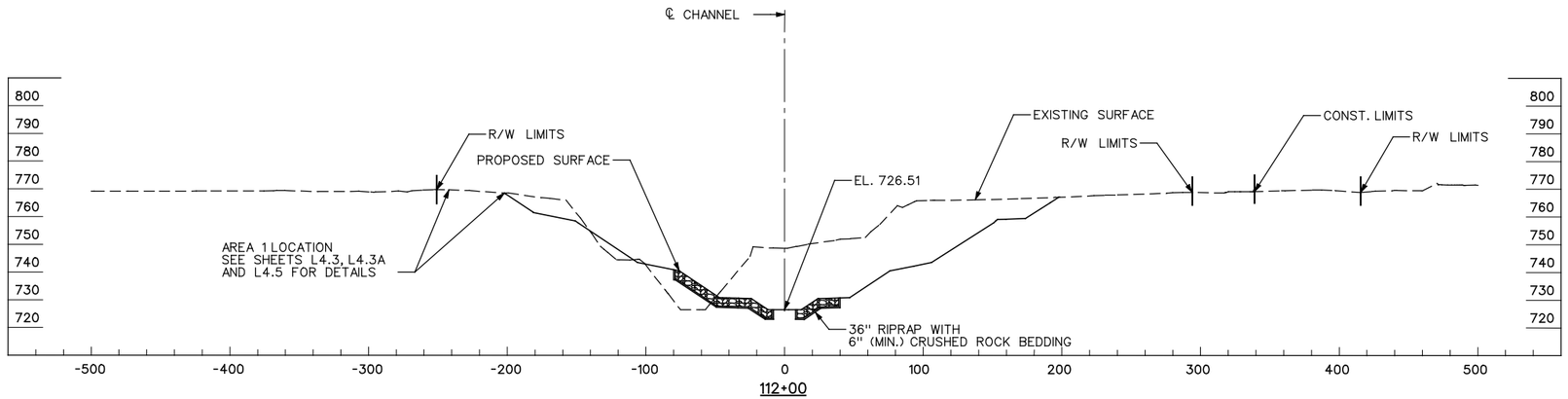
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

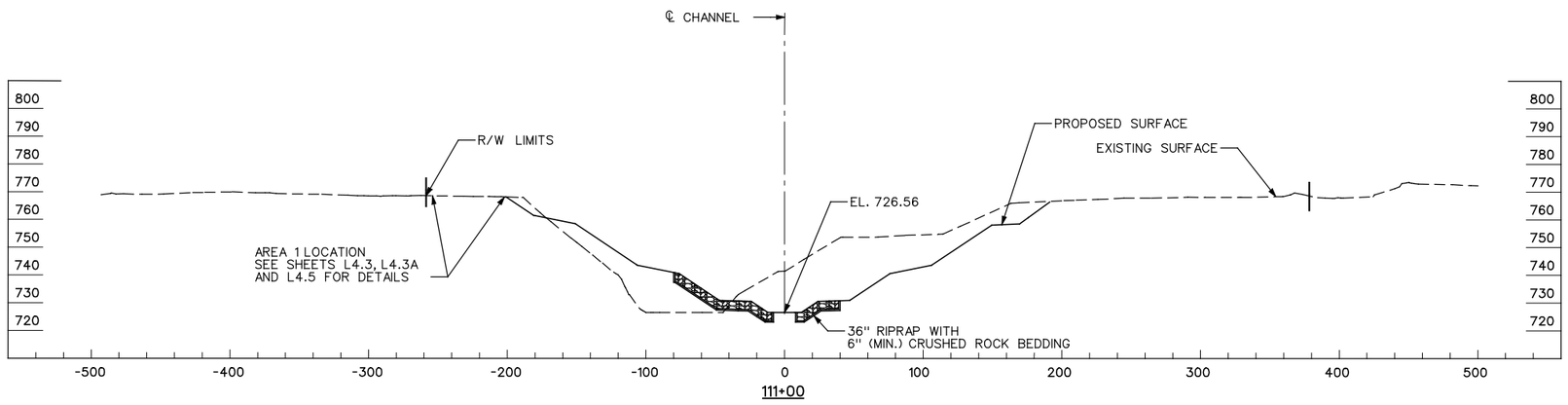
HDR
HDR Engineering, Inc.

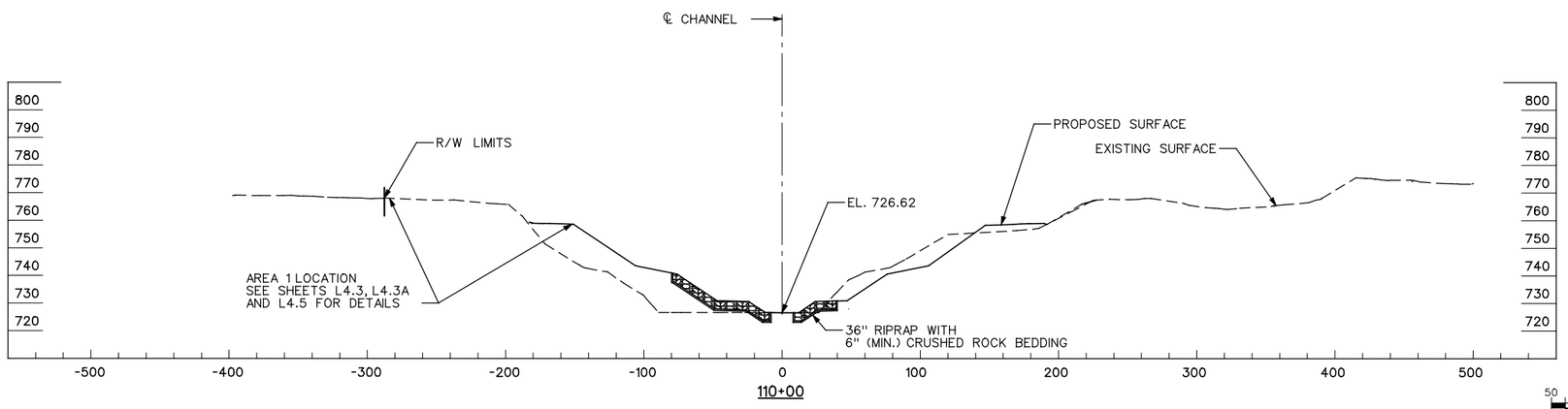
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 8

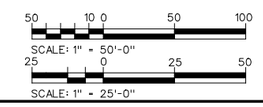
Sheet Reference Number:
C5.8







NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.



US Army Corps
of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS0109.DGN

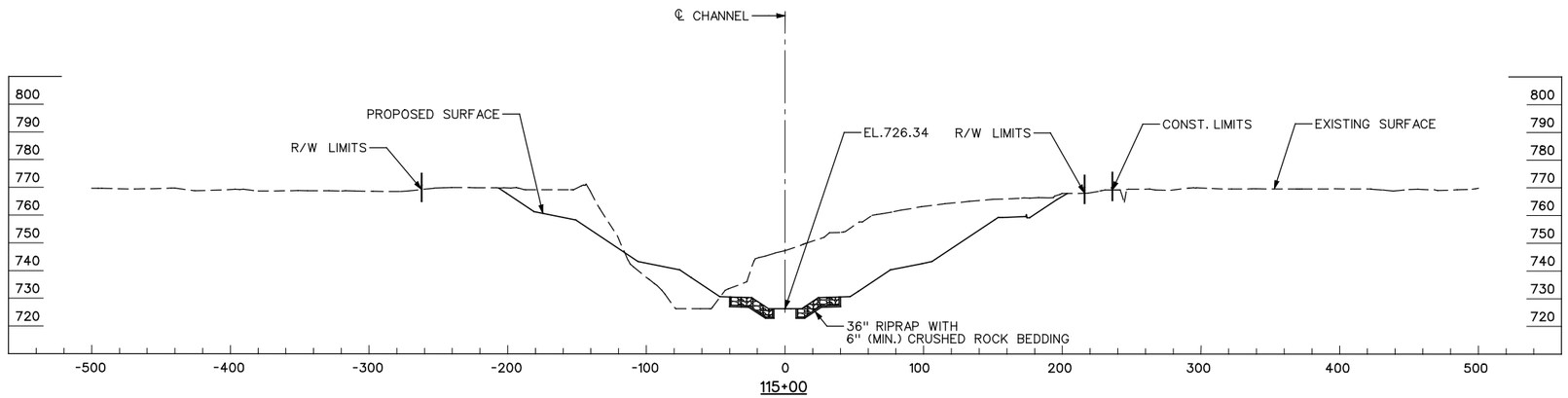
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

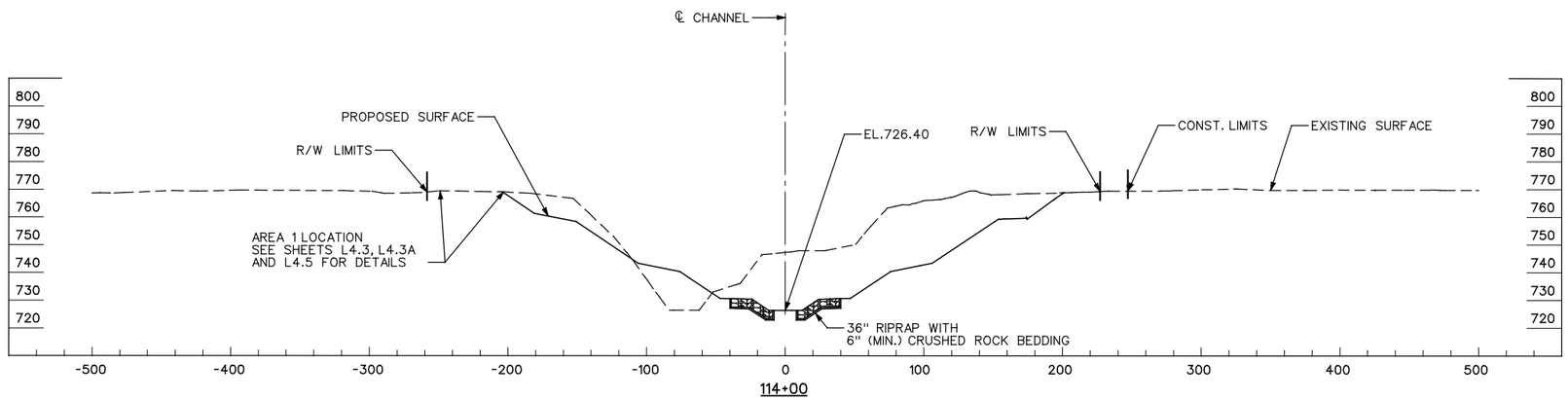
HDR
HDR Engineering, Inc.

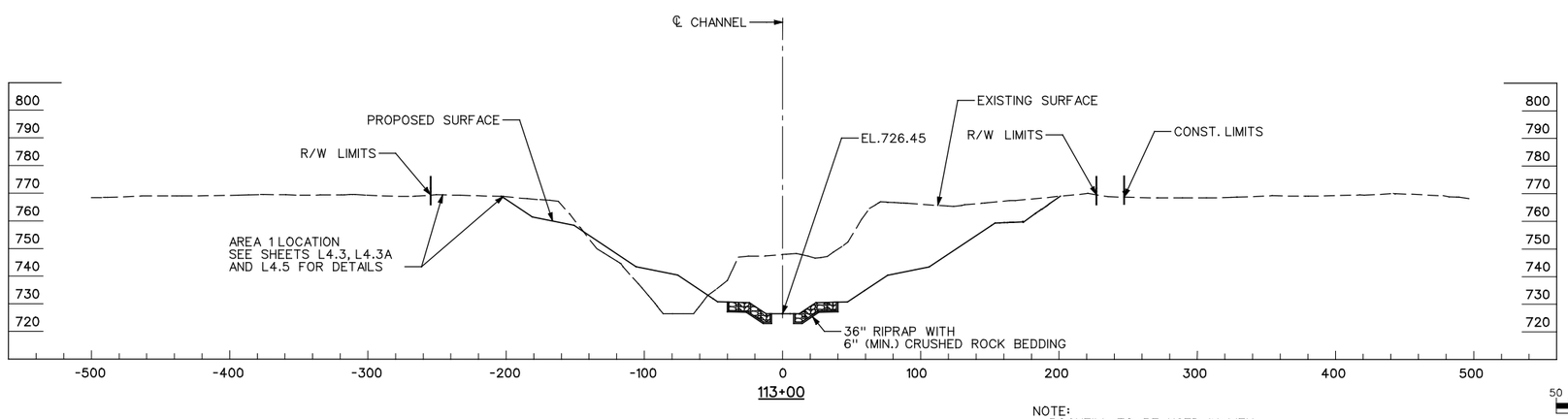
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 9

Sheet Reference Number:
C5.9







NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Drawn by: MLW, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRKS0110.DGN

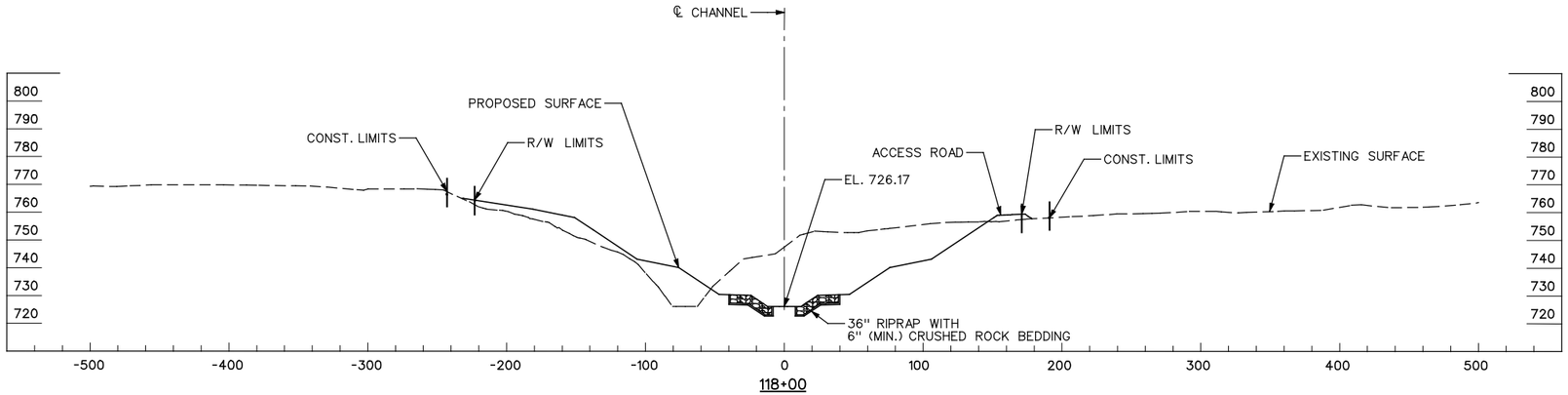
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

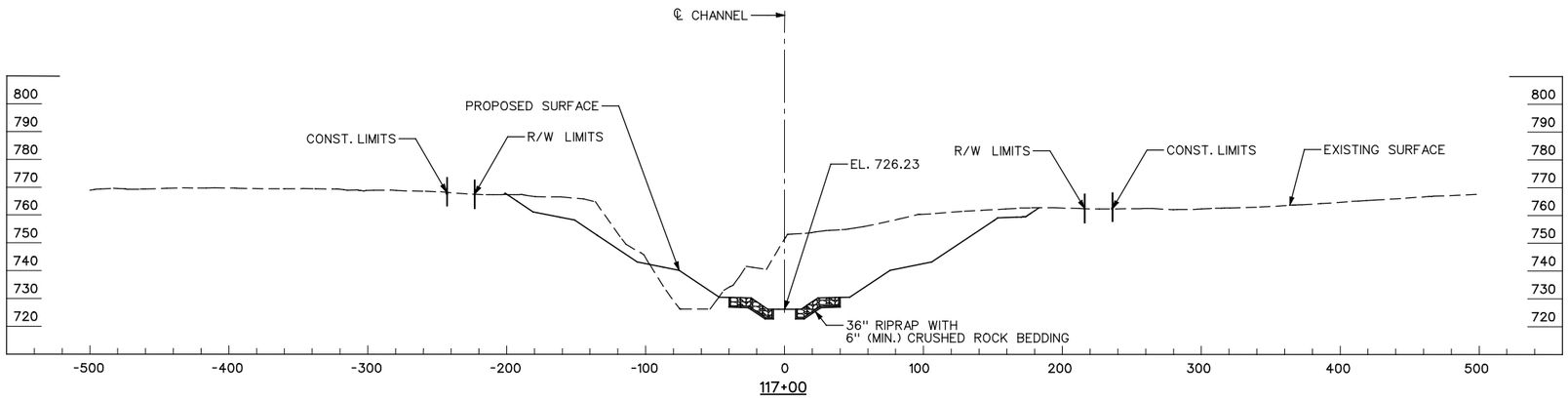
HDR Engineering, Inc.

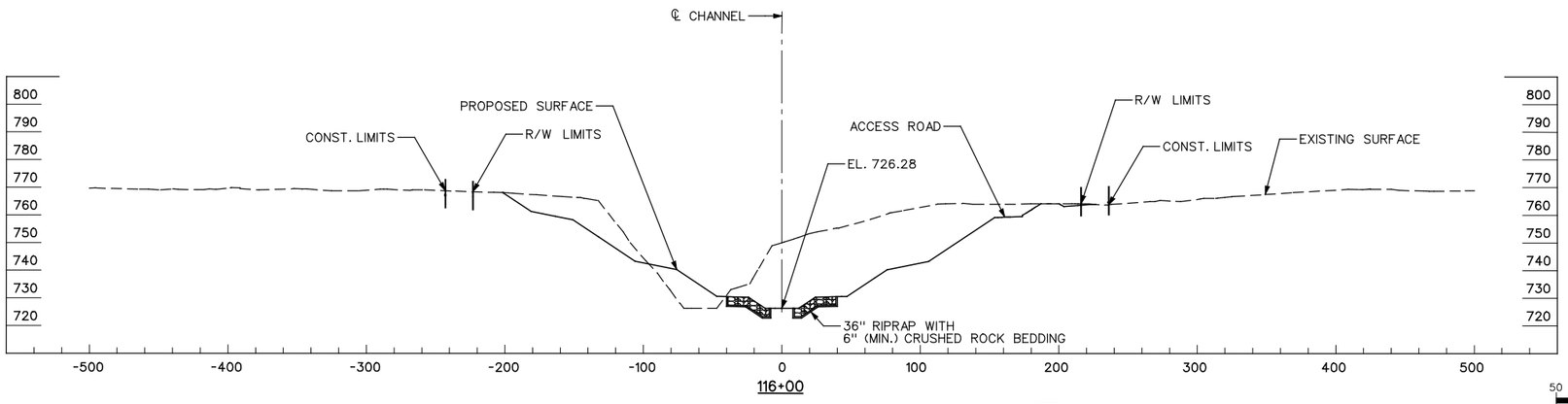
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 10

Sheet Reference Number:
C5.10







NOTE:
ROCKFILL TO BE USED IN LIEU OF BEDDING UNDERWATER.

SCALE: 1" = 50'-0"

SCALE: 1" = 20'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: WWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRKS0111.DGN

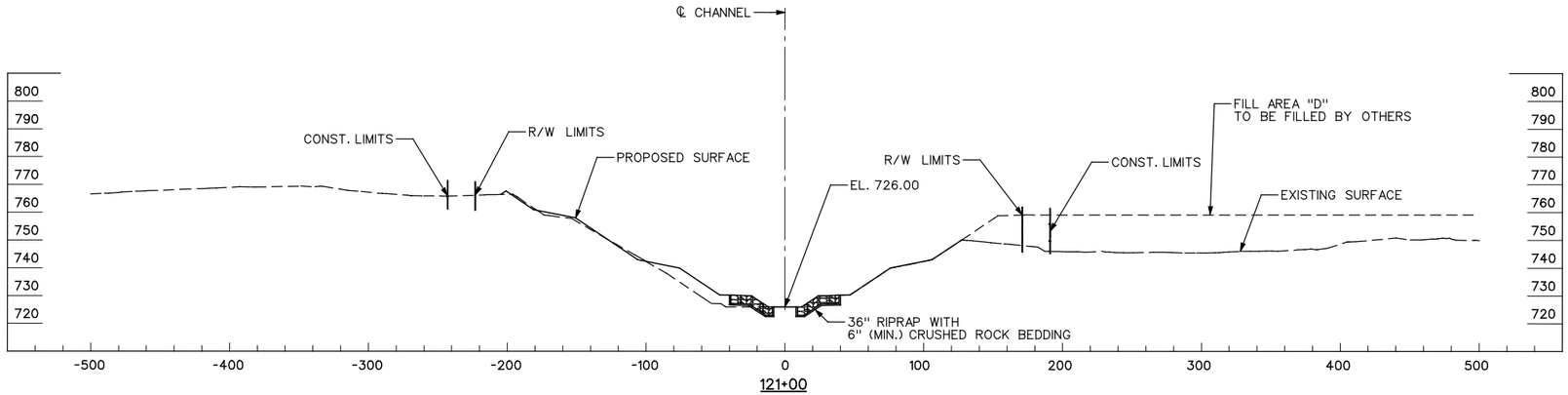
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

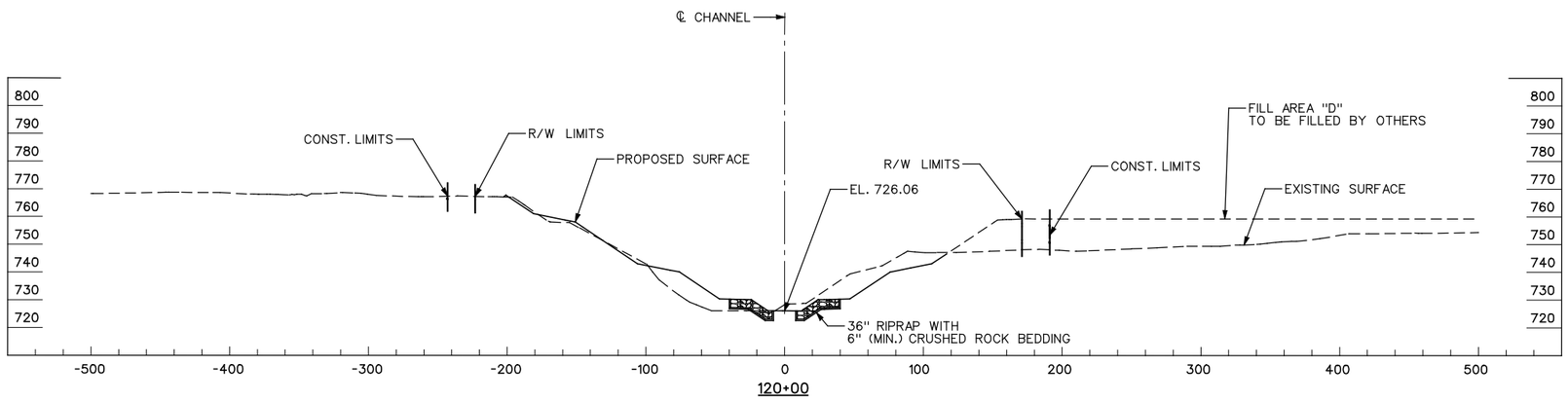
HDR
HDR Engineering, Inc.

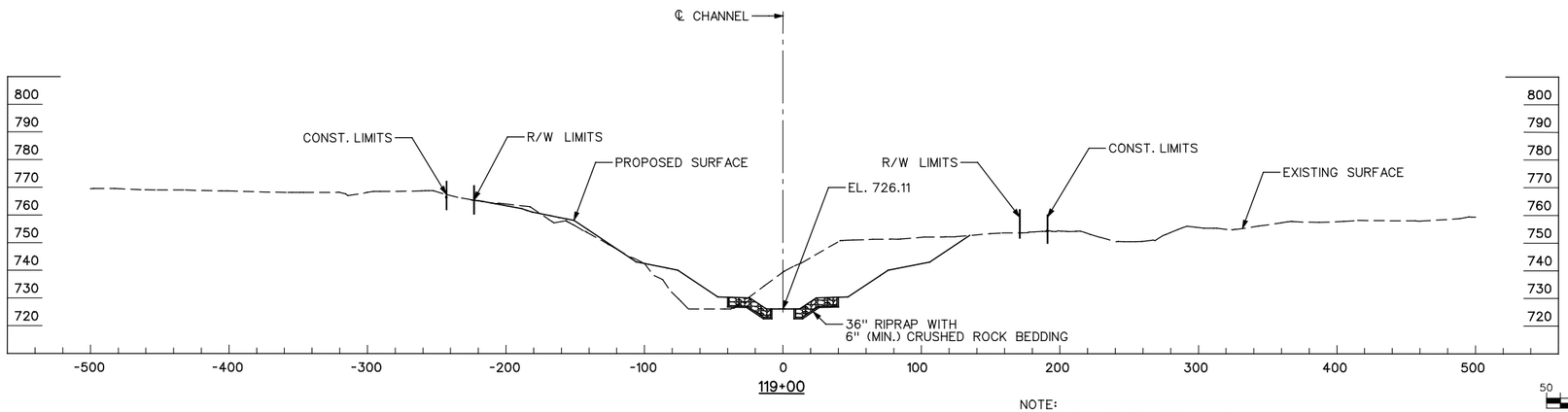
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 11

Sheet Reference Number:
C5.11







NOTE:
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 20'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRK5012.DGN

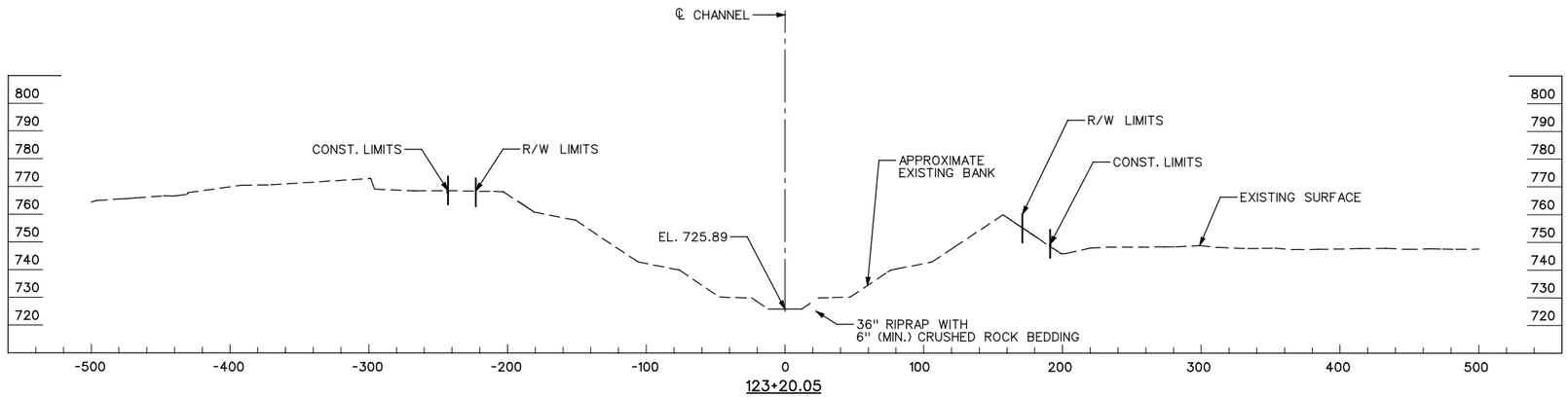
U.S. ARMY ENGINEER DISTRICT
ACOPS CIVIL ENGINEERS
KANSAS CITY, MISSOURI

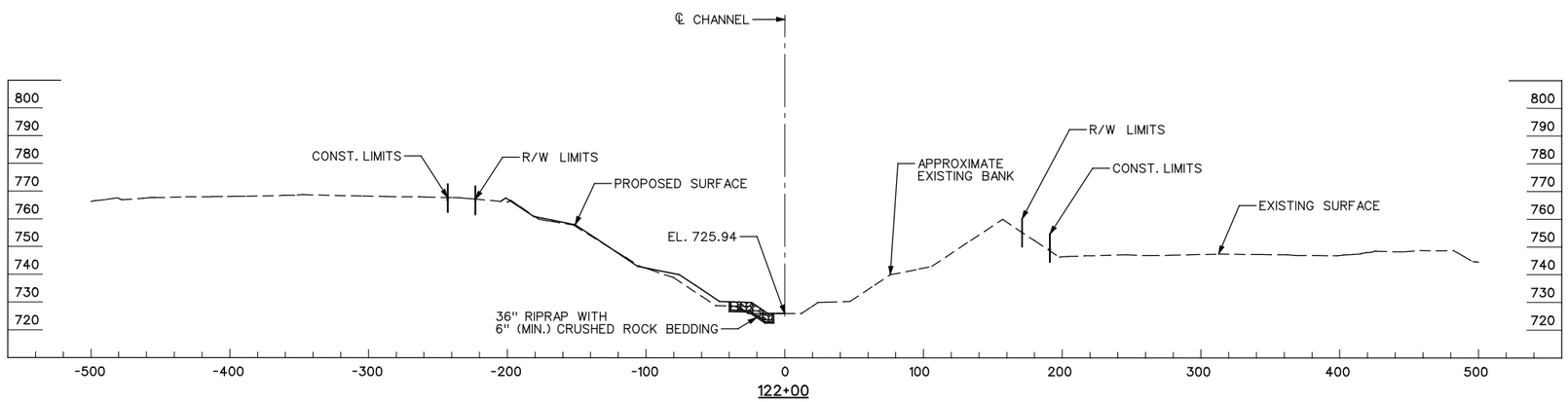
HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 12

Sheet Reference Number:
C5.12





NOTES
ROCKFILL TO BE USED IN LIEU
OF BEDDING UNDERWATER.

50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps
of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Drawn by: MLW, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRK50113.DGN

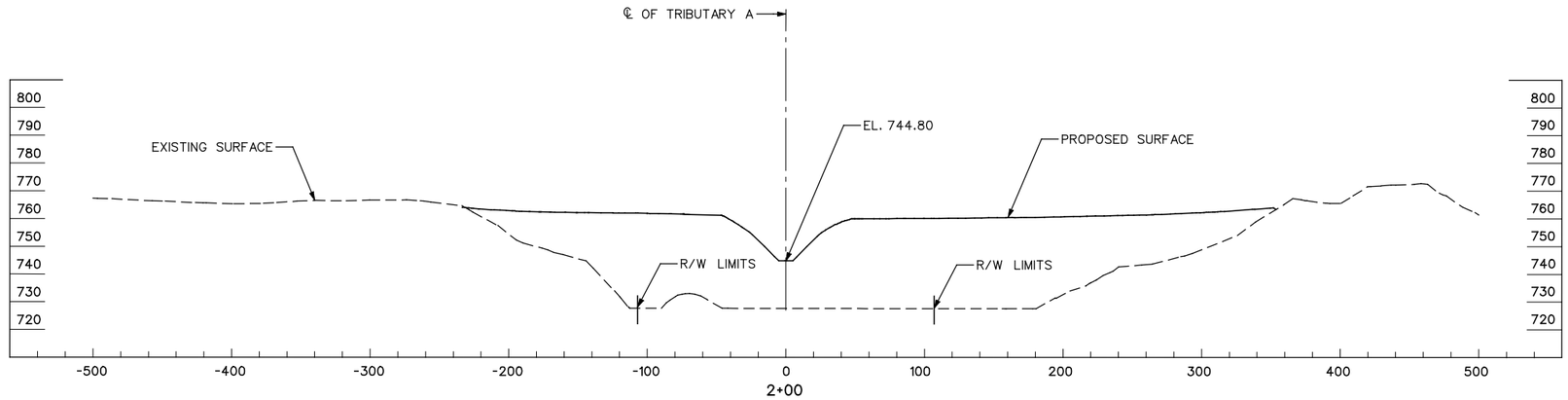
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

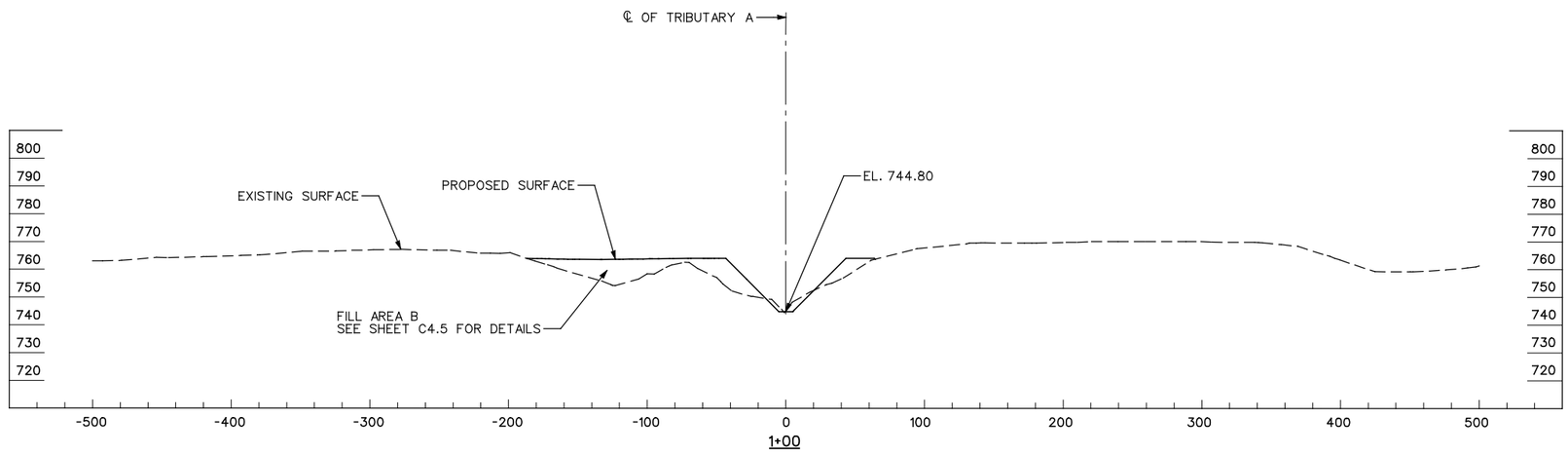
HDR
HDR Engineering, Inc.

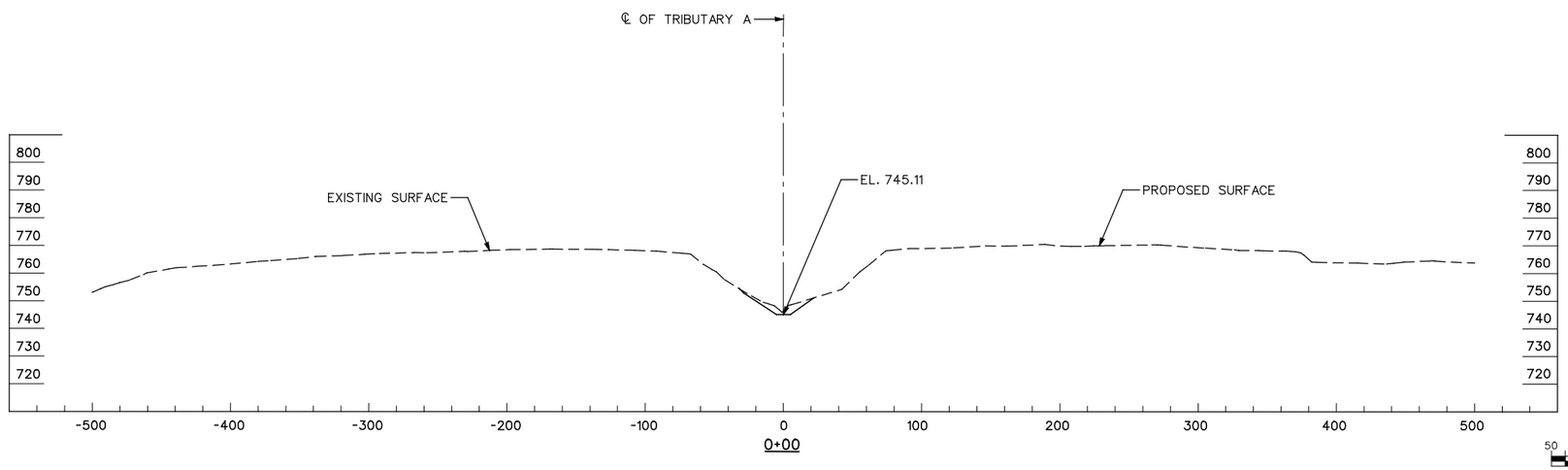
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

CHANNEL CROSS-SECTIONS
SHEET 13

Sheet Reference Number:
C5.13







50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: WWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRK50114.DGN

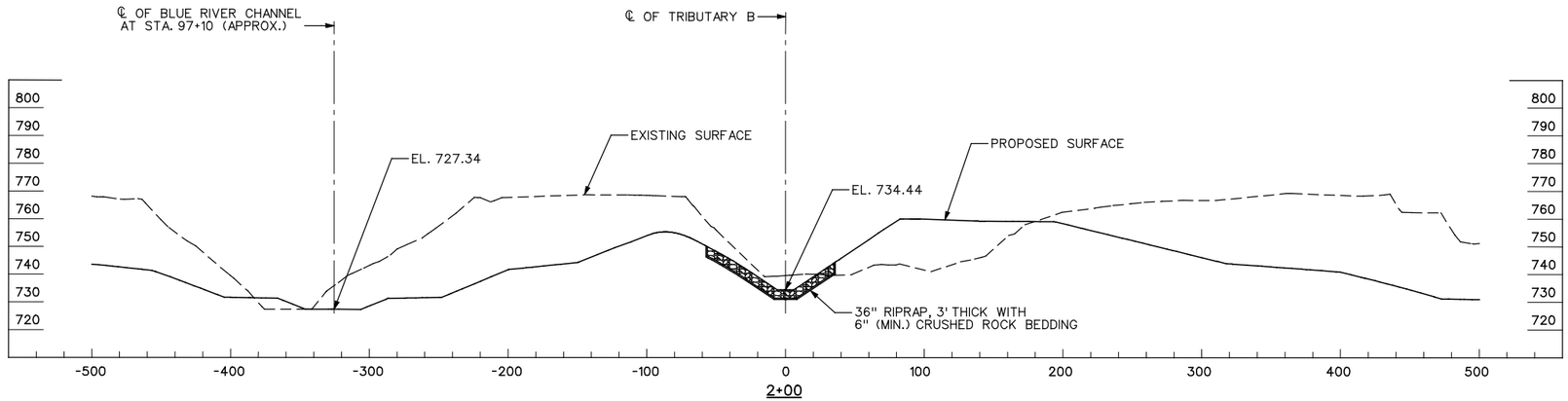
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

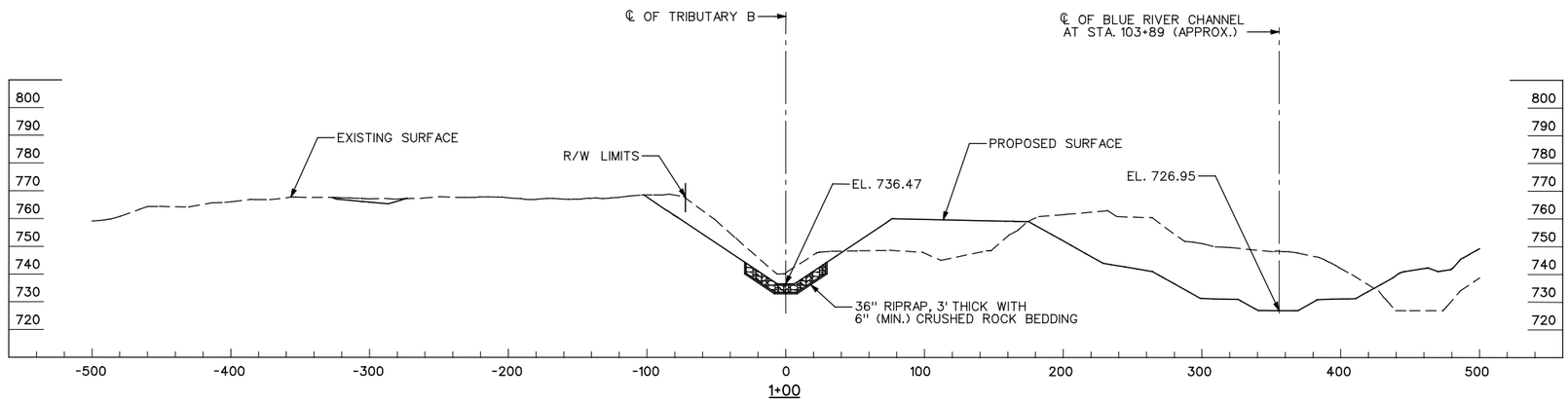
HDR
HDR Engineering, Inc.

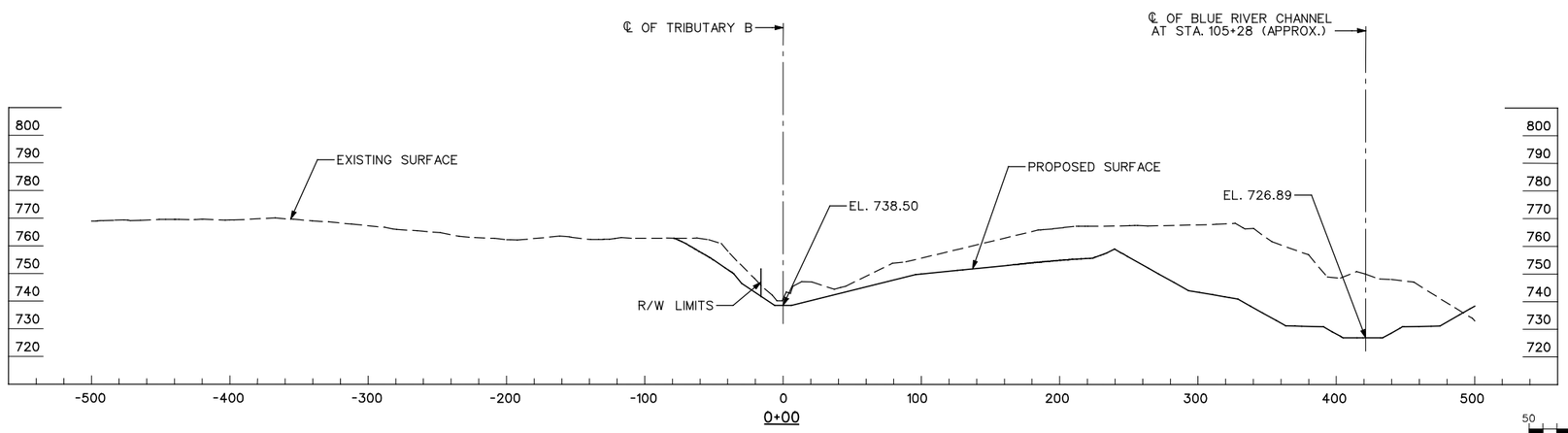
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TRIBUTARY AT STA. 90+65
CROSS-SECTIONS

Sheet Reference Number:
C5.14







NOTE:
FOR DETAILS OF ROCK RIPRAP IN BLUE RIVER CHANNEL SEE CHANNEL CROSS SECTIONS SHEETS.

50 10 0 50 100
SCALE: 1" = 50'-0"

25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Drawn by: MLW, JAS
Checked by: WWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRK50115.DGN

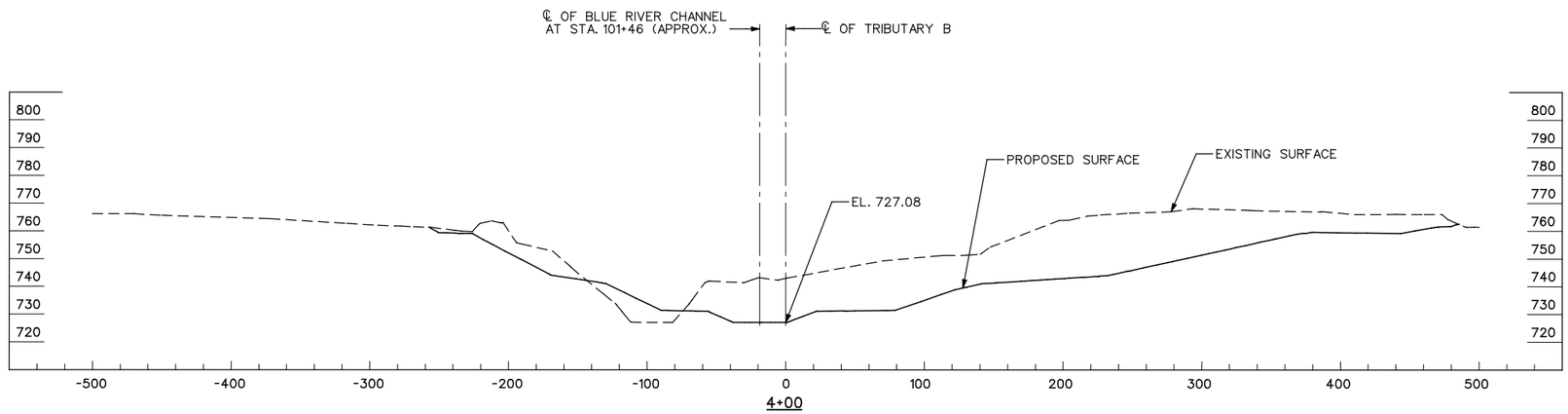
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

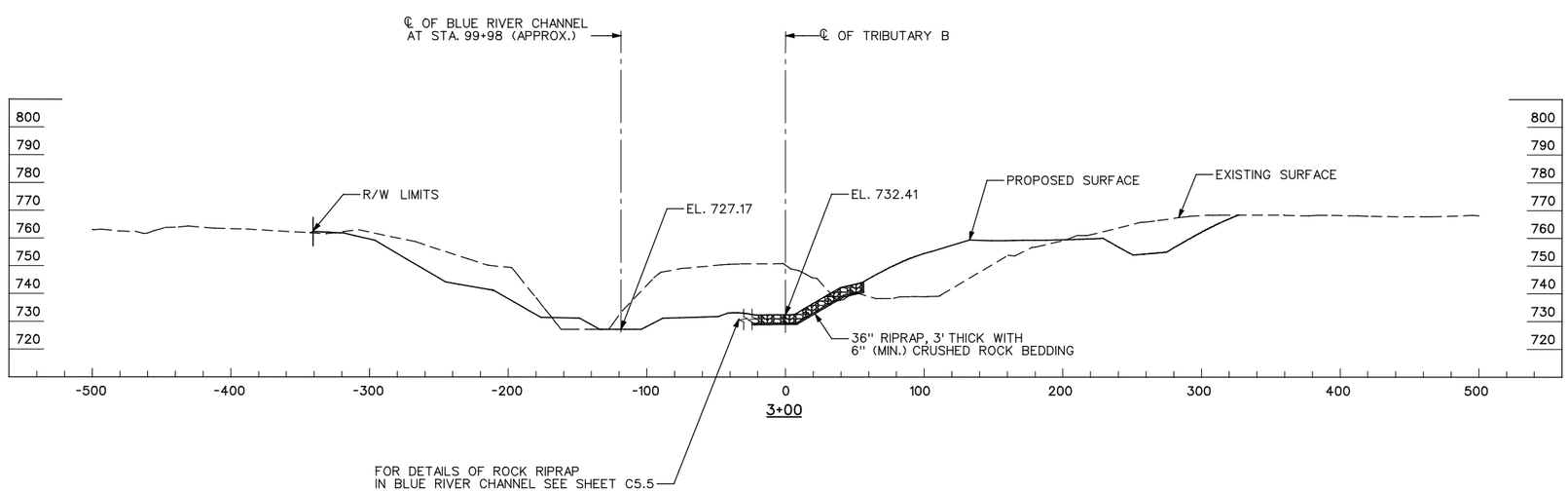
HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TRIBUTARY AT STA. 101+70
CROSS-SECTIONS
SHEET 1

Sheet Reference Number:
C5.15





50 10 0 50 100
SCALE: 1" = 50'-0"
25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/05/08	

Designed by: RD, NLF
Date: AUGUST 2008
Drawn by: MLW, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRK50T16.DGN

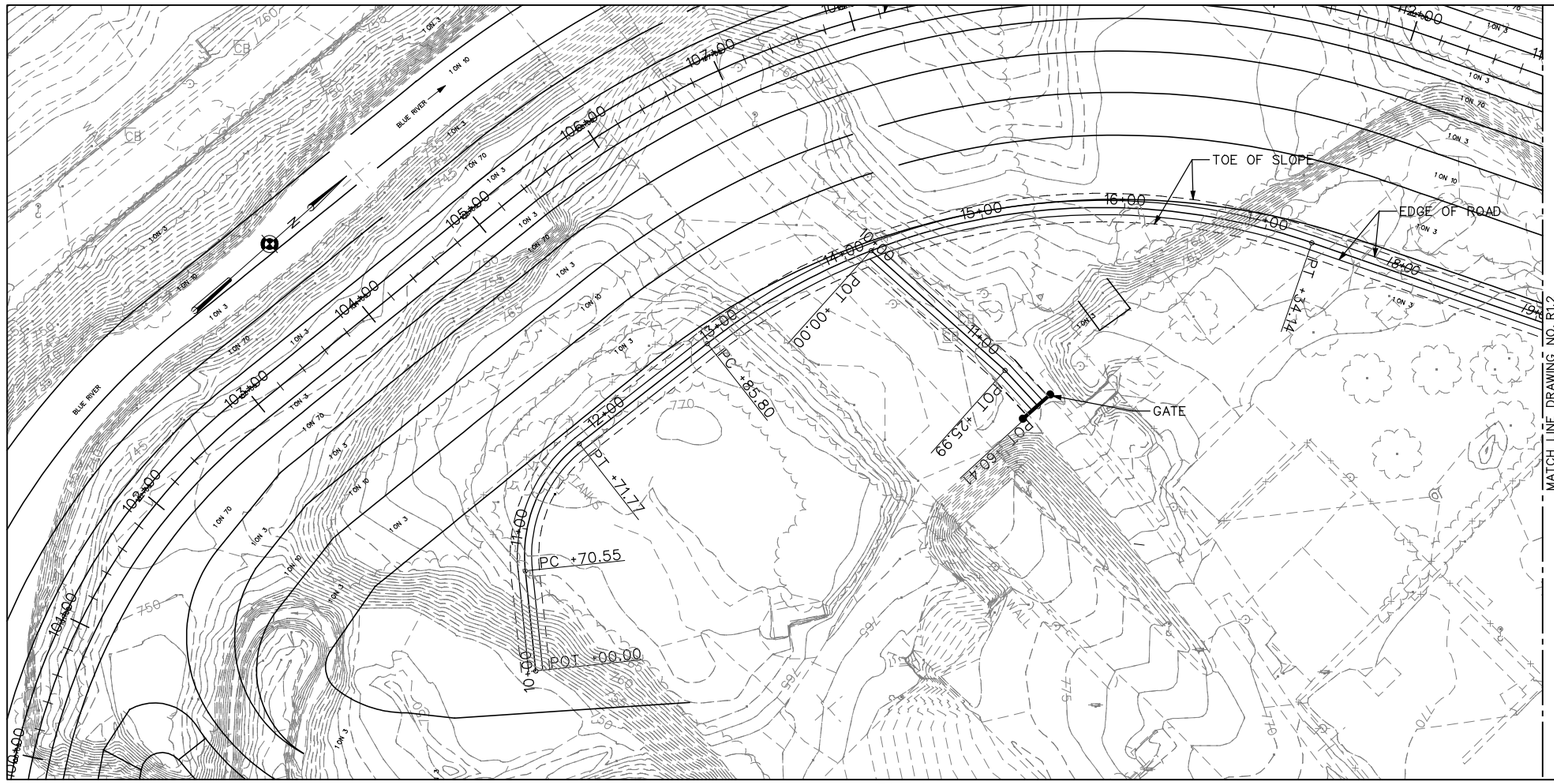
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

TRIBUTARY AT STA. 101+70
CROSS-SECTIONS
SHEET 2

Sheet Reference Number:
C5.16

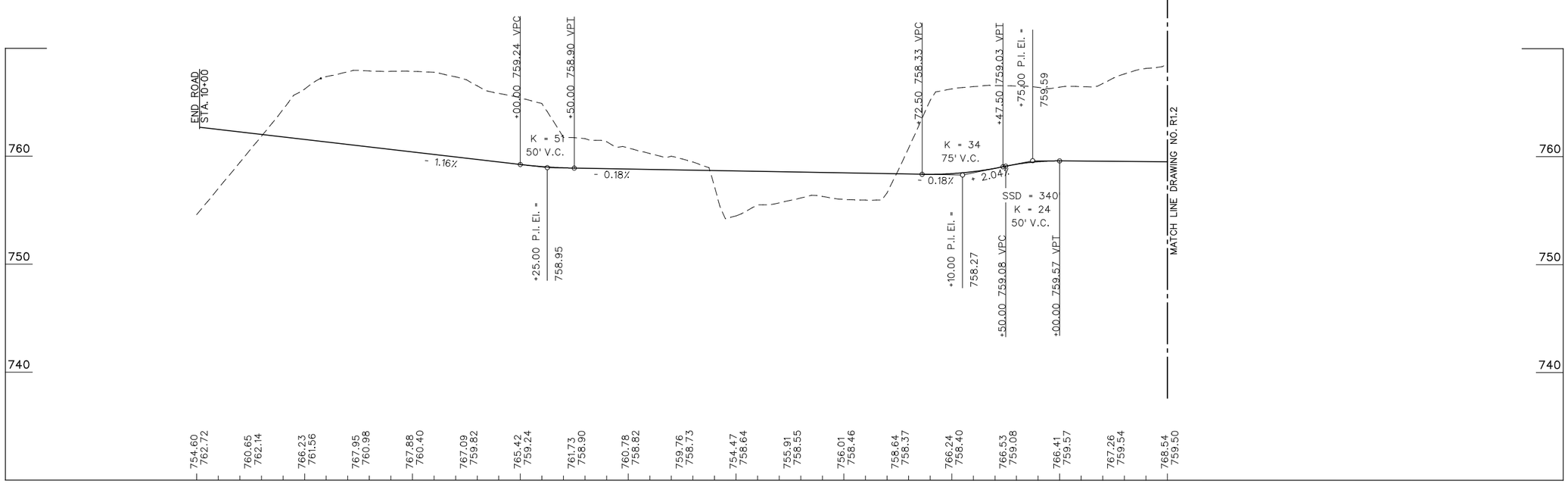


NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.
2. FOR GATE DETAIL, SEE SHEET R1.3.

N.E. ACCESS ALIGNMENT DATA			
POINT	STATION	NORTHING	EASTING
POT	+00.00	1043863.429	492844.247
PC	+70.55	1043904.377	492786.799
PT	+71.77	1043991.872	492745.025
PC	+85.80	1044105.693	492751.938
PT	+34.14	1044470.304	492979.936

PLAN

SCALE: 1" = 50'-0"



PROFILE

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRANDTBNE.DGN

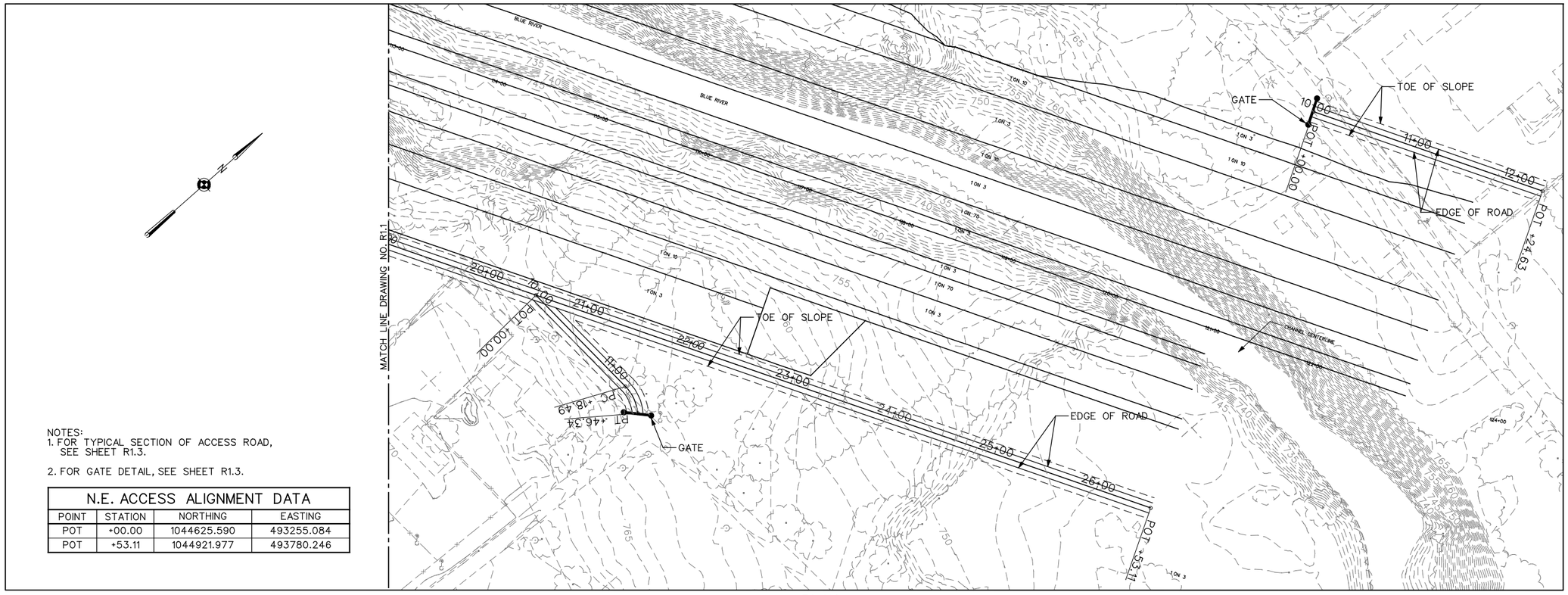
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

N.E. ACCESS ROAD
PLAN AND PROFILE

Sheet Reference Number:
R1.1



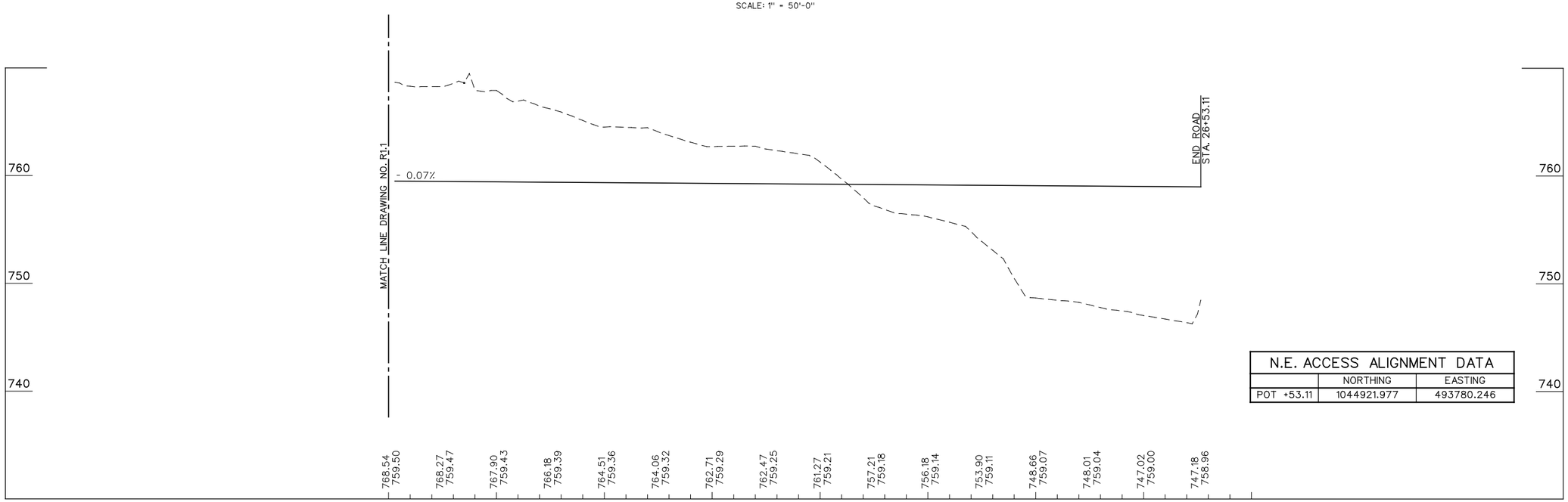
NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.

2. FOR GATE DETAIL, SEE SHEET R1.3.

N.E. ACCESS ALIGNMENT DATA			
POINT	STATION	NORTHING	EASTING
POT	+00.00	1044625.590	493255.084
POT	+53.11	1044921.977	493780.246

PLAN

SCALE: 1" = 50'-0"



N.E. ACCESS ALIGNMENT DATA		
	NORTHING	EASTING
POT +53.11	1044921.977	493780.246

PROFILE

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRARO1N2E.DGN

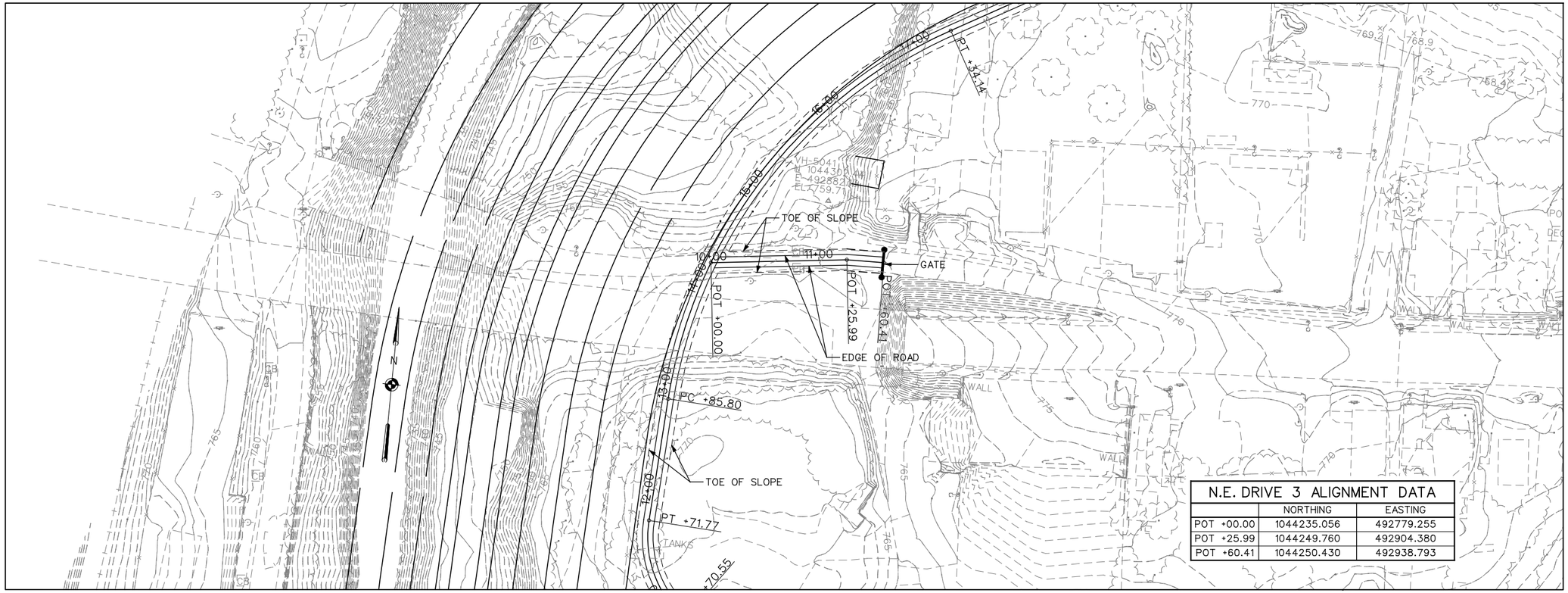
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

N.E. ACCESS ROAD
PLAN AND PROFILE

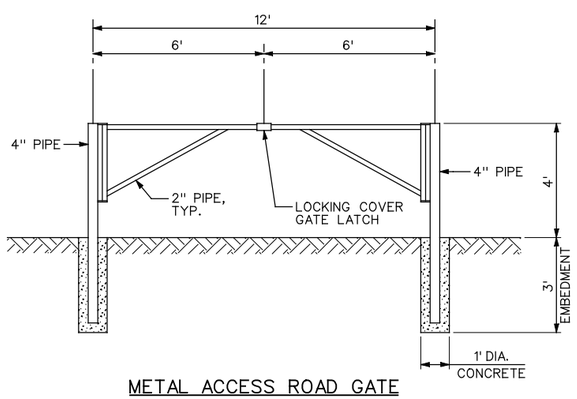
Sheet Reference Number:
R1.2



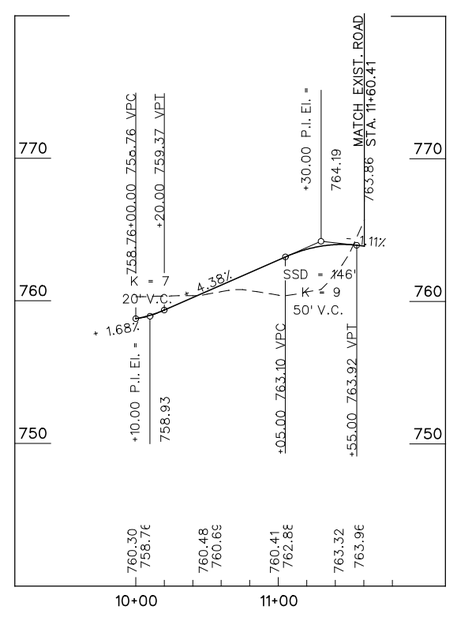
N.E. DRIVE 3 ALIGNMENT DATA		
	NORTHING	EASTING
POT +00.00	1044235.056	492779.255
POT +25.99	1044249.760	492904.380
POT +60.41	1044250.430	492938.793

PLAN

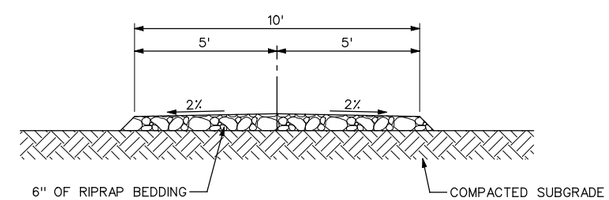
SCALE: 1" = 50'-0"



METAL ACCESS ROAD GATE



PROFILE



ACCESS ROAD TYPICAL SECTION

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRKR03DNE.DGN

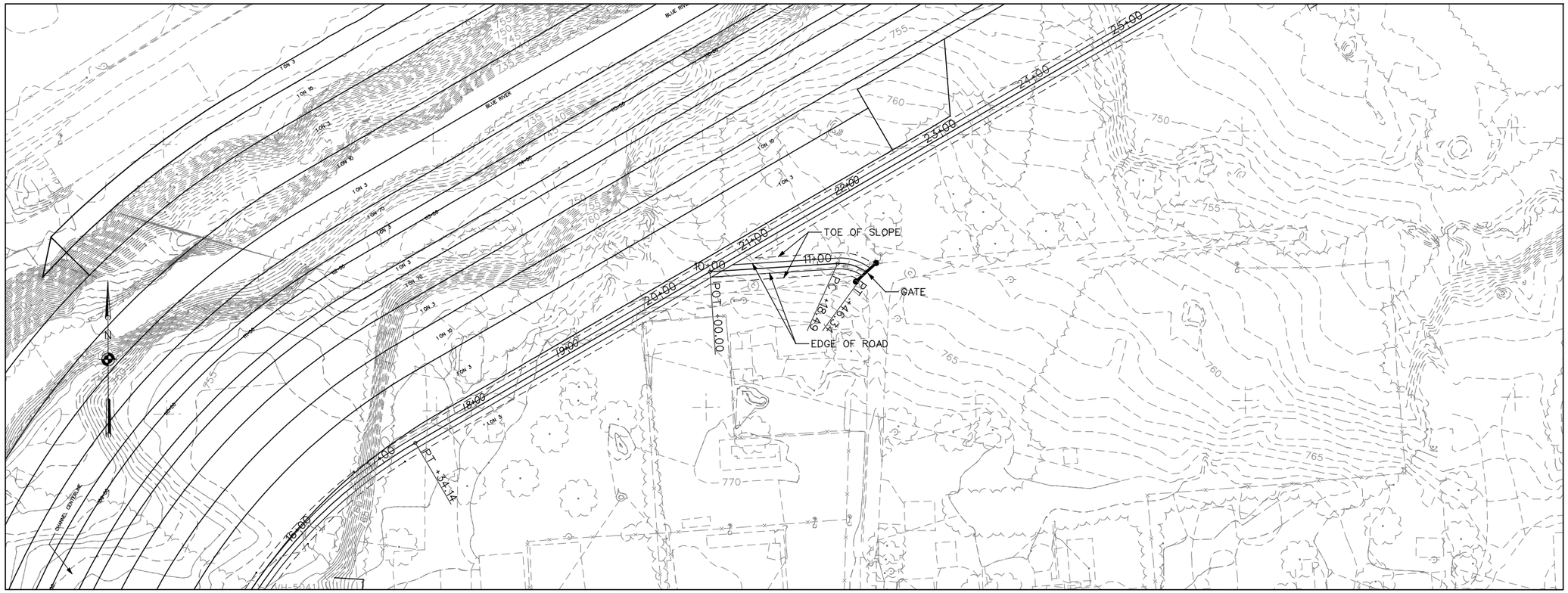
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

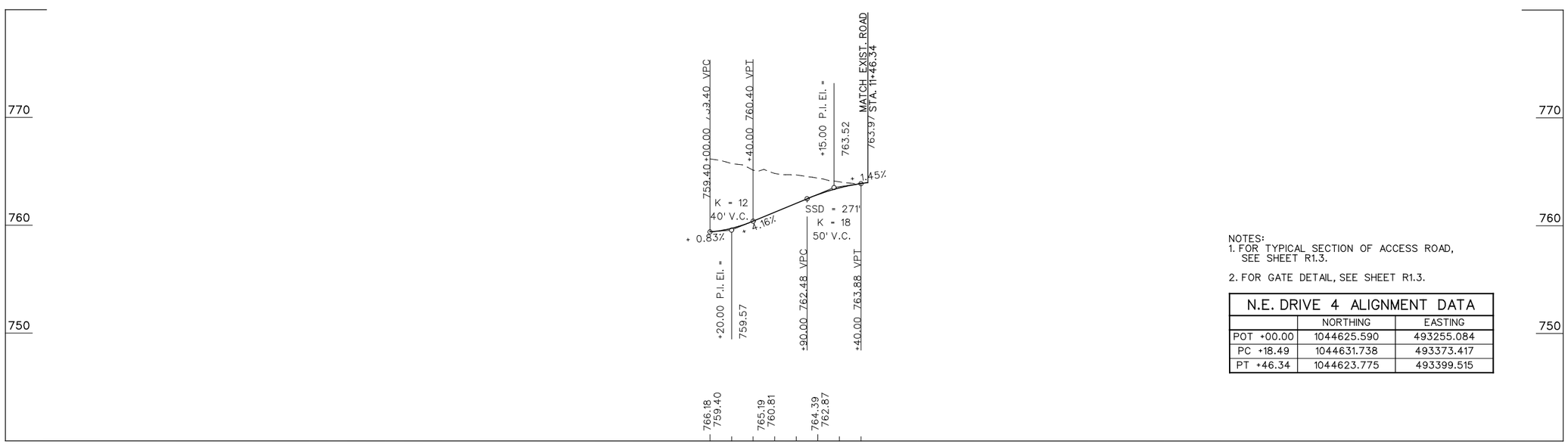
N.E. DRIVE 3
PLAN AND PROFILE

Sheet Reference Number:
R1.3



PLAN

SCALE: 1" = 50'-0"



PROFILE

NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.

2. FOR GATE DETAIL, SEE SHEET R1.3.

N.E. DRIVE 4 ALIGNMENT DATA		
	NORTHING	EASTING
POT +00.00	1044625.590	493255.084
PC +18.49	1044631.738	493373.417
PT +46.34	1044623.775	493399.515

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRARDTB-NE.DGN

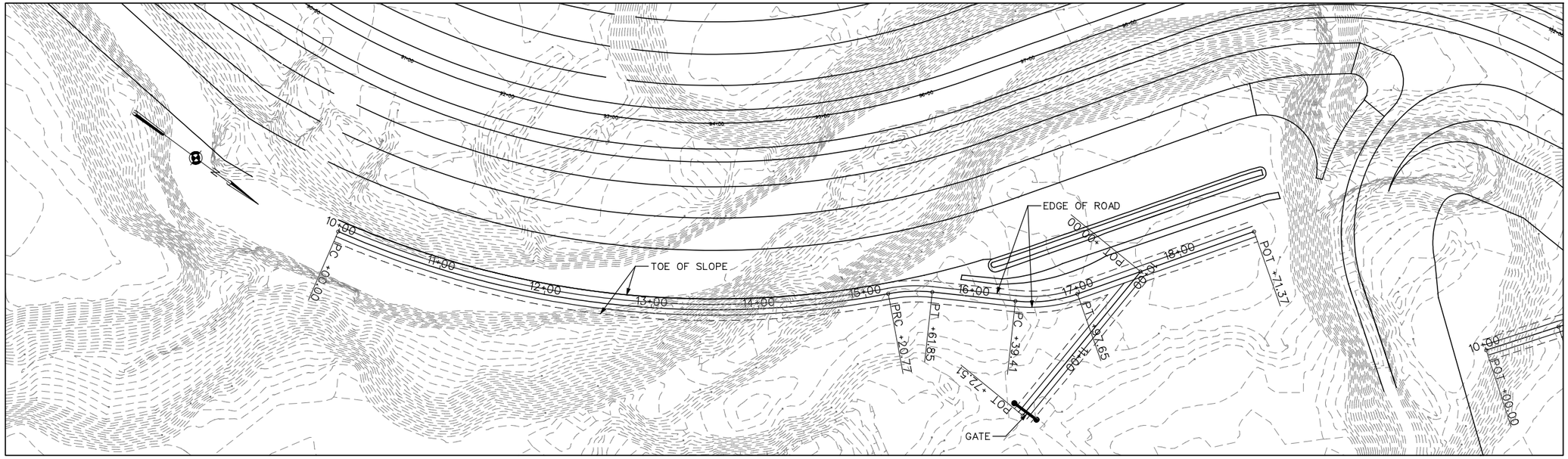
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

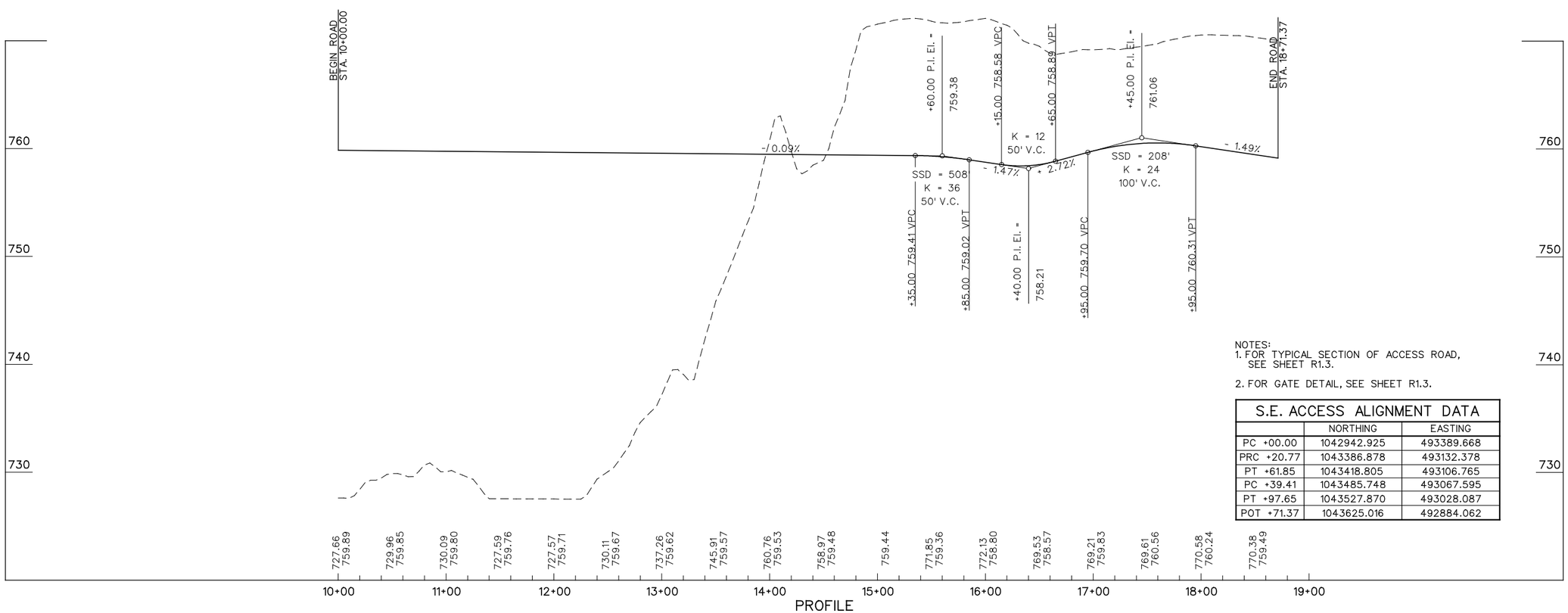
N.E. DRIVE 4
PLAN AND PROFILE

Sheet Reference Number:
R1.4



SCALE: 1" = 50'-0"

PLAN



PROFILE

NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.
2. FOR GATE DETAIL, SEE SHEET R1.3.

S.E. ACCESS ALIGNMENT DATA

	NORTHING	EASTING
PC +00.00	1042942.925	493389.668
PRC +20.77	1043386.878	493132.378
PT +61.85	1043418.805	493106.765
PC +39.41	1043485.748	493067.595
PT +97.65	1043527.870	493028.087
POT +71.37	1043625.016	492884.062

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Date: AUGUST 2008
Drawn by: JJ, JAS
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: BRUR01DSSE.DGN

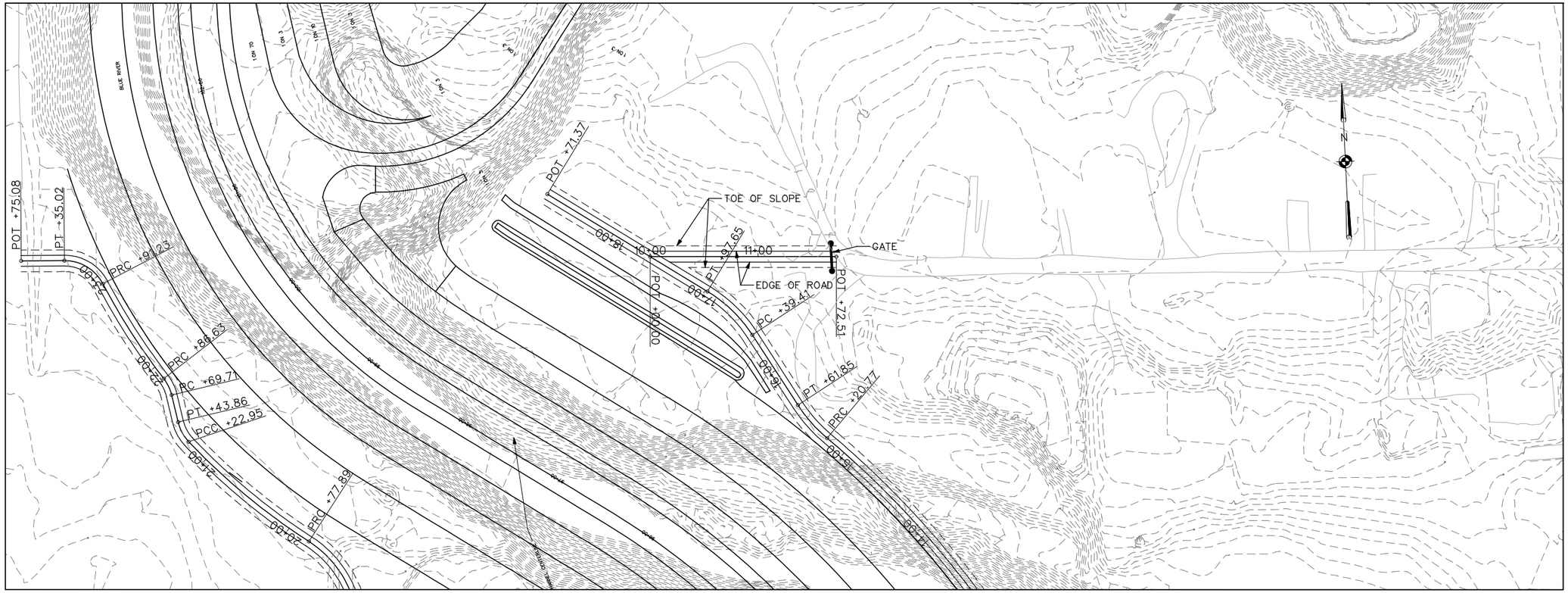
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER MAINSTEM
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

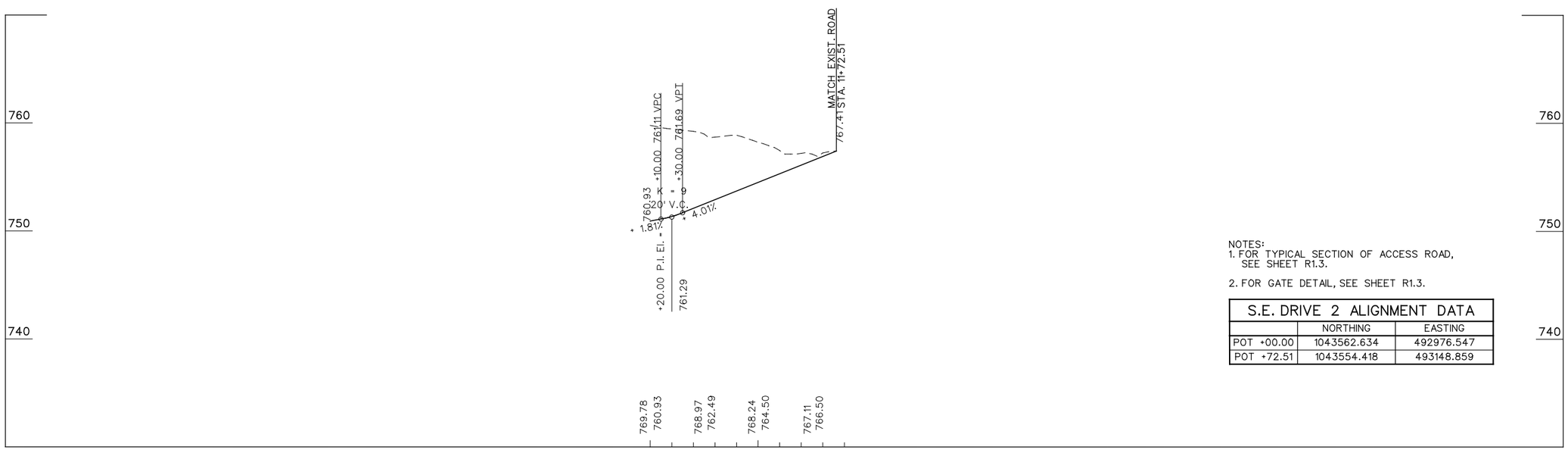
S.E. ACCESS ROAD
PLAN AND PROFILE

Sheet Reference Number:
R1.5



PLAN

SCALE: 1" = 50'-0"



PROFILE

NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.

2. FOR GATE DETAIL, SEE SHEET R1.3.

S.E. DRIVE 2 ALIGNMENT DATA		
	NORTHING	EASTING
POT +00.00	1043562.634	492976.547
POT +72.51	1043554.418	493148.859

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINAL - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRARD1BSE.DGN

U.S. ARMY ENGINEER DISTRICT
US CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

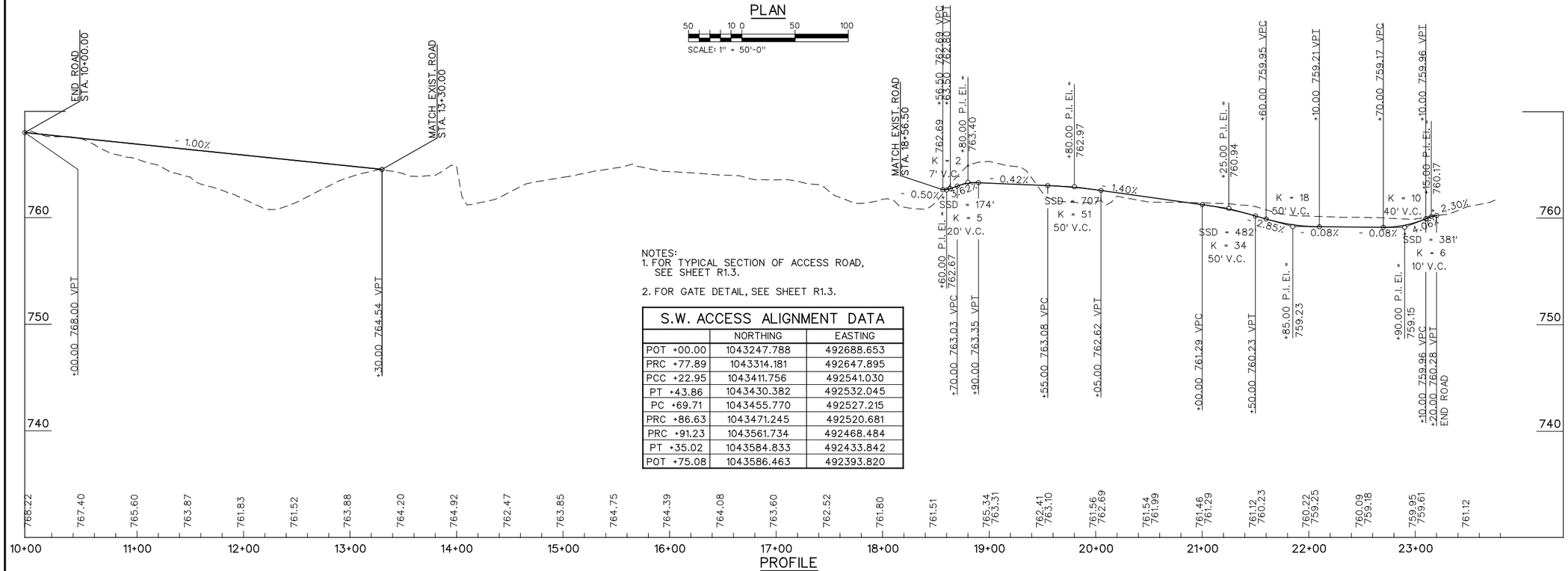
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

S.E. DRIVE 2 PLAN AND PROFILE

Sheet Reference Number:
R1.6

PLAN

SCALE: 1" = 50'-0"



PROFILE

NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.
2. FOR GATE DETAIL, SEE SHEET R1.3.

S.W. ACCESS ALIGNMENT DATA

	NORTHING	EASTING
POT +00.00	1043247.788	492688.653
PRC +77.89	1043314.181	492647.895
PCC +22.95	1043411.756	492541.030
PT +43.86	1043430.382	492532.045
PC +69.71	1043455.770	492527.215
PRC +86.63	1043471.245	492520.681
PRC +91.23	1043561.734	492468.484
PT +35.02	1043584.833	492433.842
POT +75.08	1043586.463	492393.820

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: BRARD07SWJDN

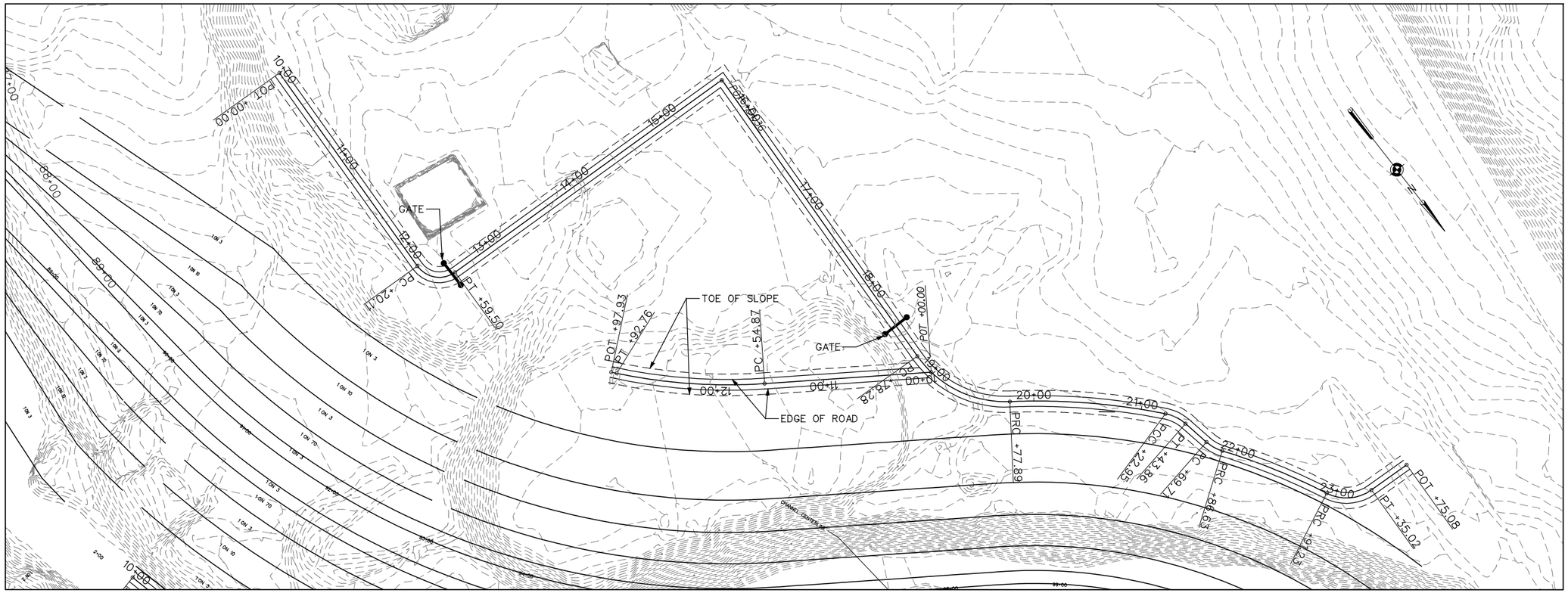
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

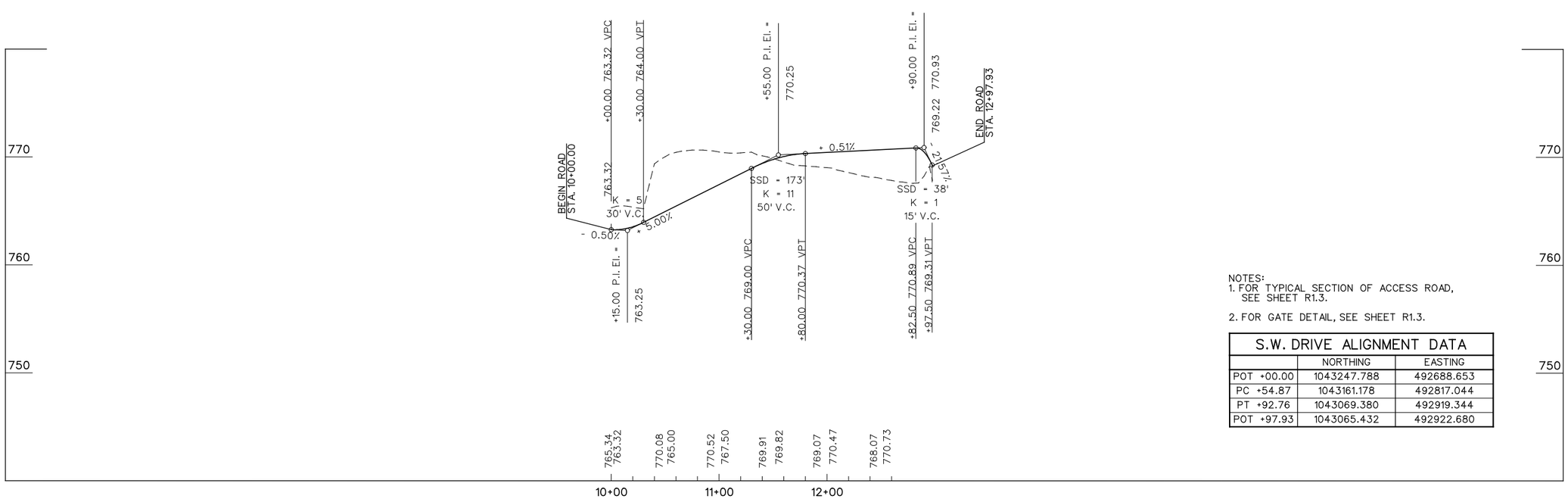
S.W. ACCESS ROAD PROFILE

Sheet Reference Number:
R1.7



PLAN

SCALE: 1" = 50'-0"



NOTES:
1. FOR TYPICAL SECTION OF ACCESS ROAD, SEE SHEET R1.3.

2. FOR GATE DETAIL, SEE SHEET R1.3.

S.W. DRIVE ALIGNMENT DATA		
	NORTHING	EASTING
POT +00.00	1043247.788	492688.653
PC +54.87	1043161.178	492817.044
PT +92.76	1043069.380	492919.344
POT +97.93	1043065.432	492922.680

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by: NLF
Drawn by: JJ, JAS
Checked by: MWJ
Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale: 1"= 50'-0"
CADD File Name: BRKRDSSWLDN

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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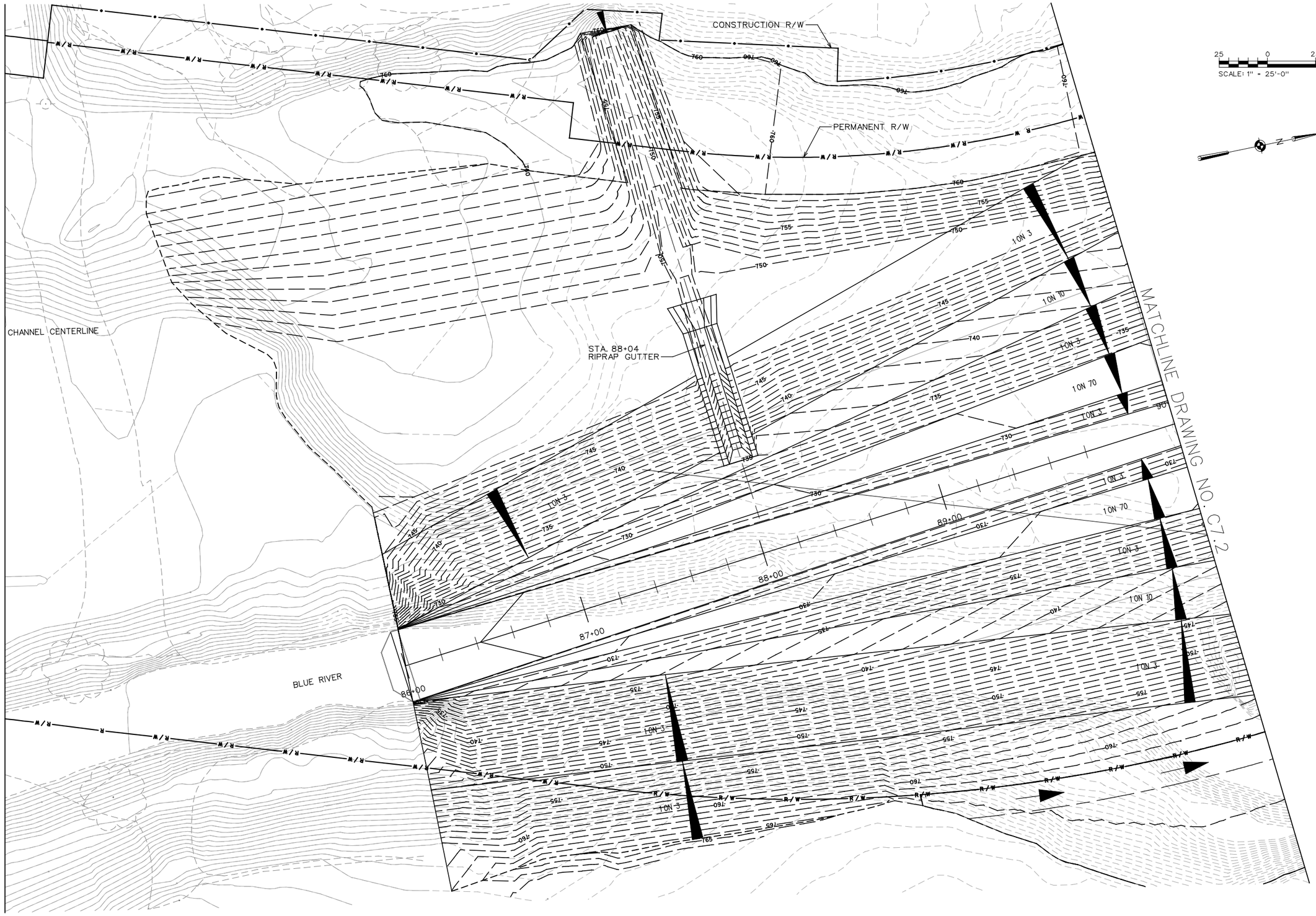
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

S.W. DRIVE PLAN AND PROFILE

Sheet Reference Number:
R1.8



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: JKD
CADD File Name:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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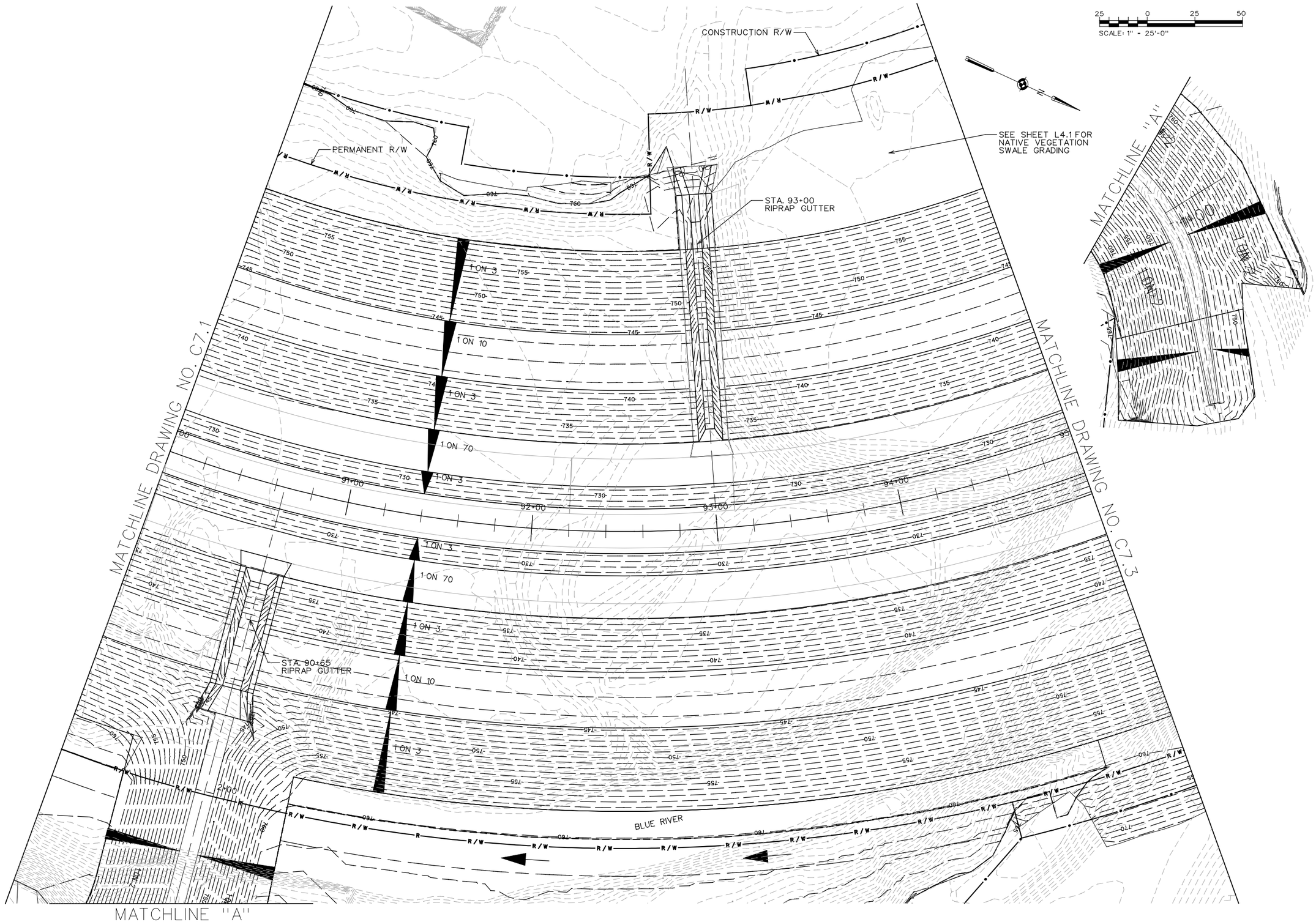
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 1

Sheet Reference Number:
C7.1



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: JKD
CADD File Name:

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CORPS OF ENGINEERS
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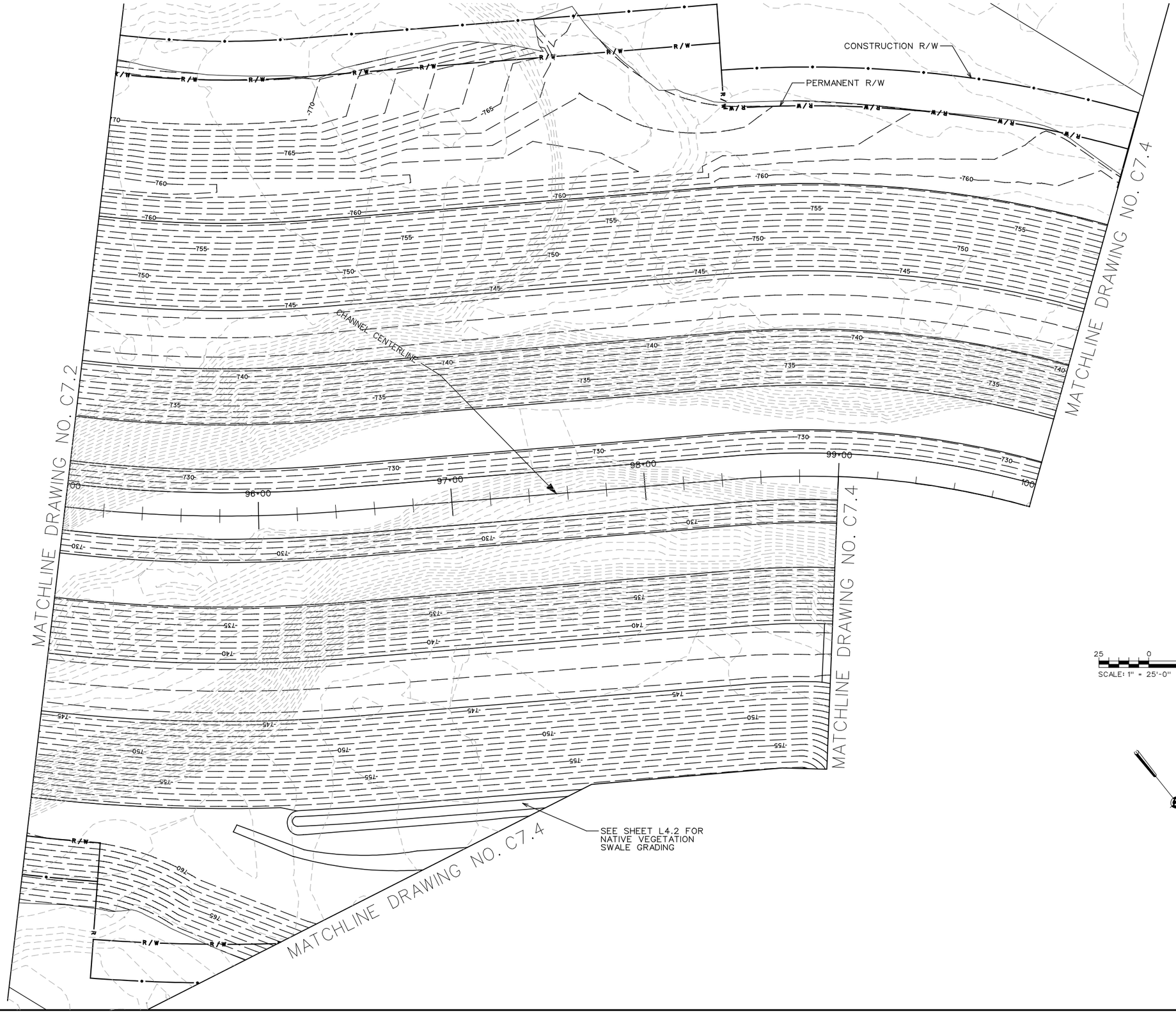
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 2

Sheet Reference Number:
C7.2



25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: JKD
CADD File Name:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 3

Sheet Reference Number:
C7.3

US Army Corps
of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:	Date: JUNE 2008
Drawn by:	Drawing code:
Checked by:	Plot scale:
Submitted by: JKD	CADD File Name:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN SHEET 4

Sheet Reference Number:
C7.4

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawing code:
Drawn by:
Plot scale:
Checked by:
CADD File Name:
Submitted by: JKD

U.S. ARMY ENGINEER DISTRICT
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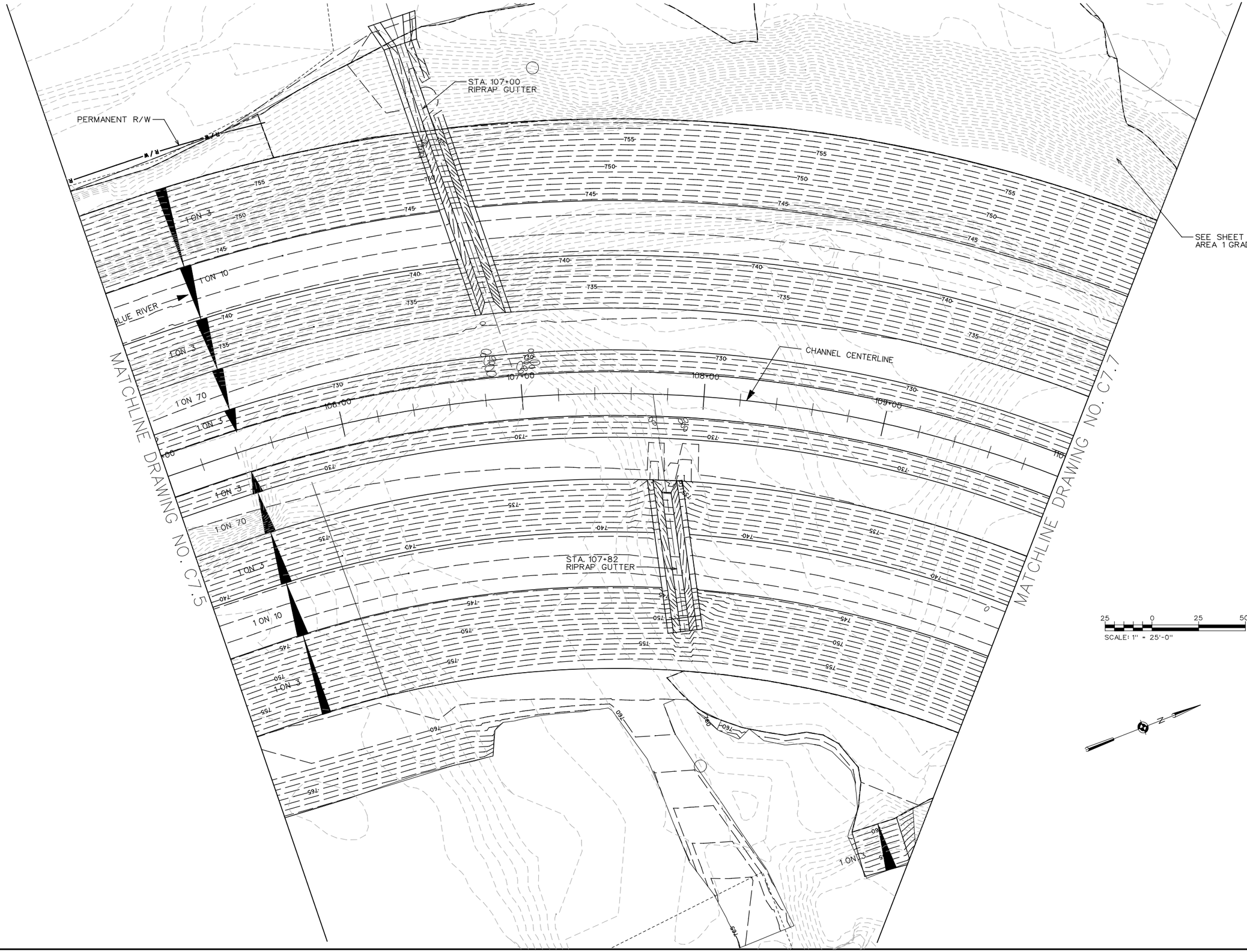
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 5

Sheet Reference Number:
C7.5



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Drawn by:
Checked by:
Submitted by: JKD
Date: JUNE 2008
Drawing code:
Plot scale:
CADD File Name:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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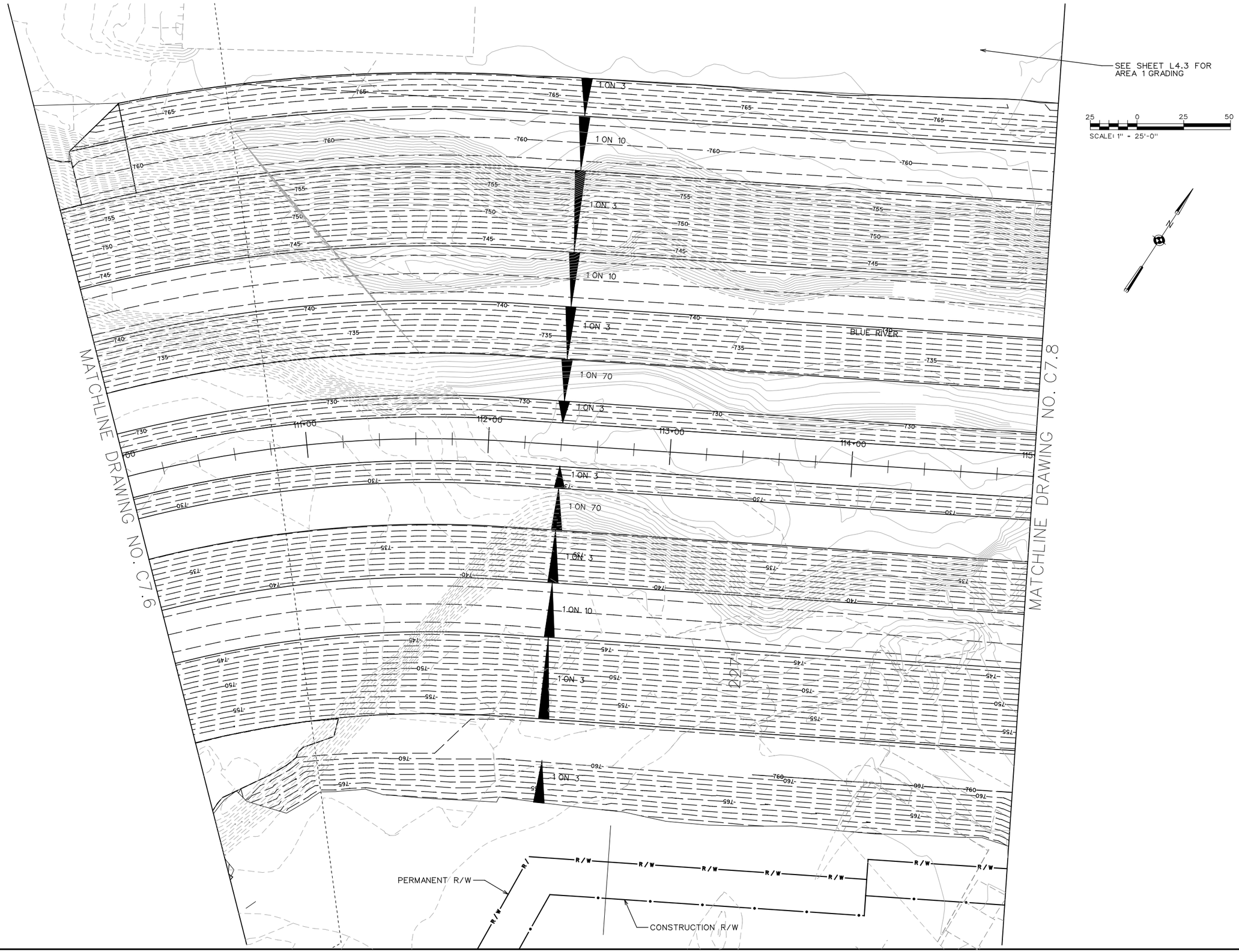
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 6

Sheet Reference Number:
C7.6



US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Drawn by:
Checked by:
Submitted by: JKD
Date: JUNE 2008
Drawing code:
Plot scale:
CADD File Name:

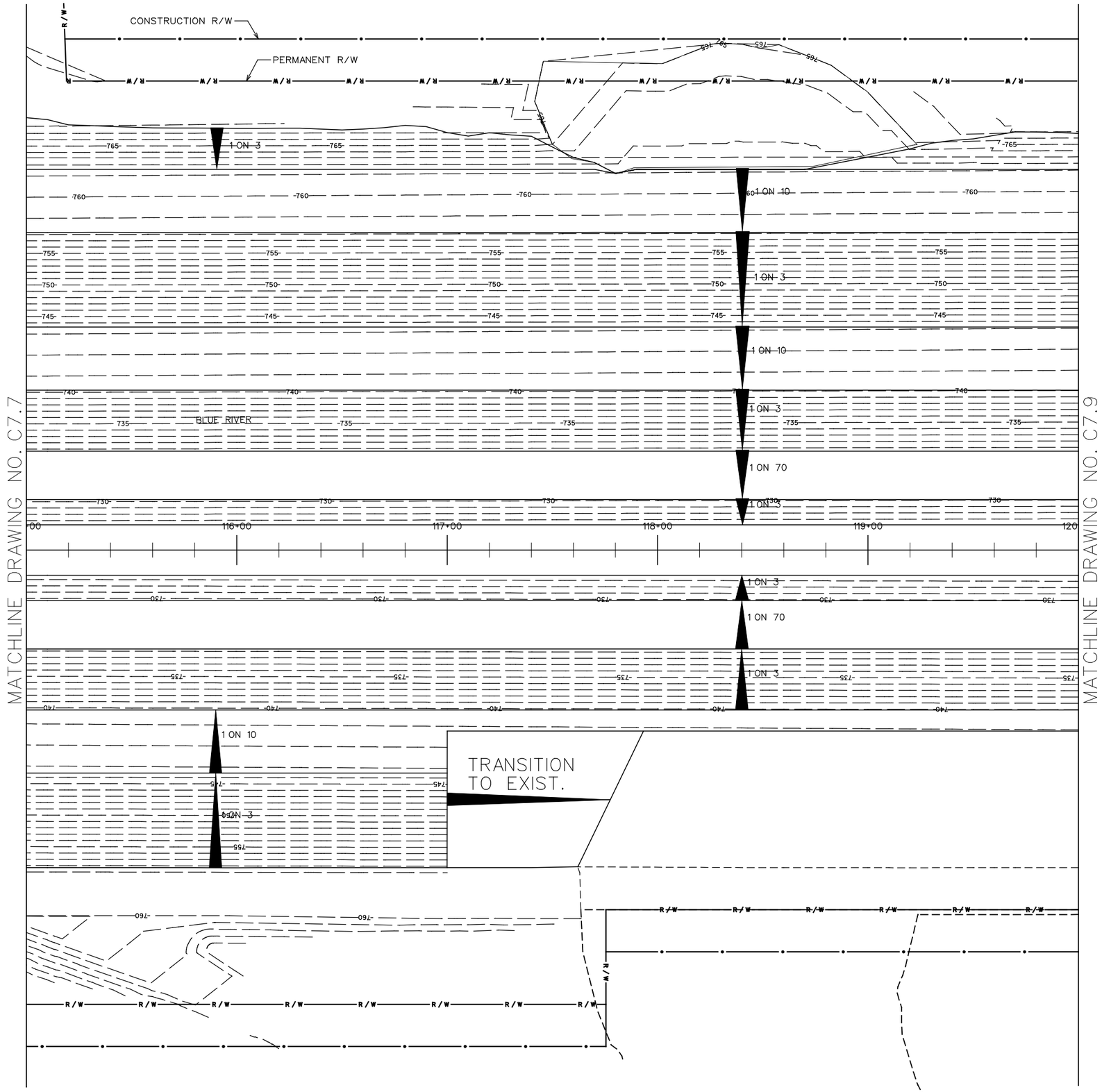
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 7

Sheet Reference Number:
C7.7



25 0 25 50
SCALE: 1" = 25'-0"

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawing code:
Drawn by:
Plot scale:
Checked by:
CADD File Name:
Submitted by: JKD

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLANS
SHEET 8

Sheet Reference Number:
C7.8

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PREFINAL - FOR REVIEW	08/05/08	

Designed by:
Date: JUNE 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: JKD
CADD File Name:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPOSED GRADING PLAN
SHEET 9

Sheet Reference Number:
C7.9

LEGEND:

- OWNED BY CITY OF KANSAS CITY
- PERMANENT RIGHT OF WAY
- TEMPORARY CONSTRUCTION EASEMENT
- TEMPORARY FILL EASEMENT

PLAN

50' 0 50' 100'

SCALE: 1" = 50'-0"

PROPERTY LINES, OWNERSHIPS AND EASEMENTS ARE REPRESENTATIVE ONLY. THE CONTRACTOR SHALL VERIFY PROPERTY LINE LOCATIONS, OWNERSHIPS AND EASEMENTS PRIOR TO CONSTRUCTION TO ENSURE THAT CONSTRUCTION IS WITHIN THE APPROPRIATE EASEMENTS AND THAT THE PERMANENT CHANNEL WORK IS WITHIN PERMANENT RIGHT OF WAY.

NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINAL - FOR REVIEW	08/06/08	

Designed by: T.K., RD
Drawn by: JAS, MLW
Checked by: MWJ
Submitted by: T.K.
Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: bdxc08b01.dgn

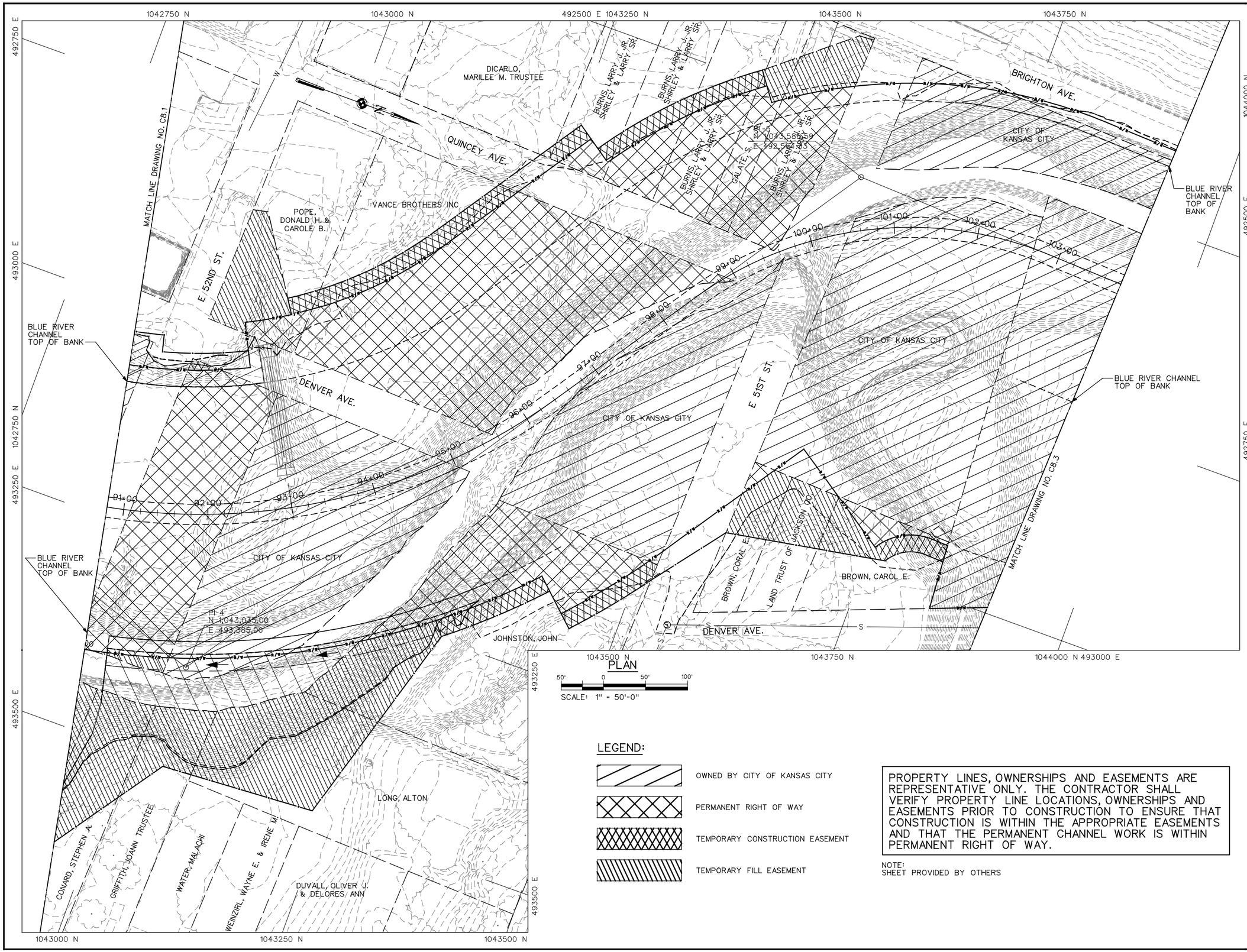
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER MAINSTEM
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPERTY OWNERSHIP AND UTILITIES
STA. 77+80 TO STA. 90+80

Sheet Reference Number:
C8.1



PLAN

SCALE: 1" = 50'-0"

LEGEND:

- OWNED BY CITY OF KANSAS CITY
- PERMANENT RIGHT OF WAY
- TEMPORARY CONSTRUCTION EASEMENT
- TEMPORARY FILL EASEMENT

PROPERTY LINES, OWNERSHIPS AND EASEMENTS ARE REPRESENTATIVE ONLY. THE CONTRACTOR SHALL VERIFY PROPERTY LINE LOCATIONS, OWNERSHIPS AND EASEMENTS PRIOR TO CONSTRUCTION TO ENSURE THAT CONSTRUCTION IS WITHIN THE APPROPRIATE EASEMENTS AND THAT THE PERMANENT CHANNEL WORK IS WITHIN PERMANENT RIGHT OF WAY.

NOTE:
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US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/05/08	

Designed by: TJK, RD
Date: AUGUST 2008
Drawn by: JAS, MLW
Drawing code:
Checked by: MWJ
Plot scale: 1" = 50'-0"
Submitted by: TJK
CADD File Name: prjc0892.dgn

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

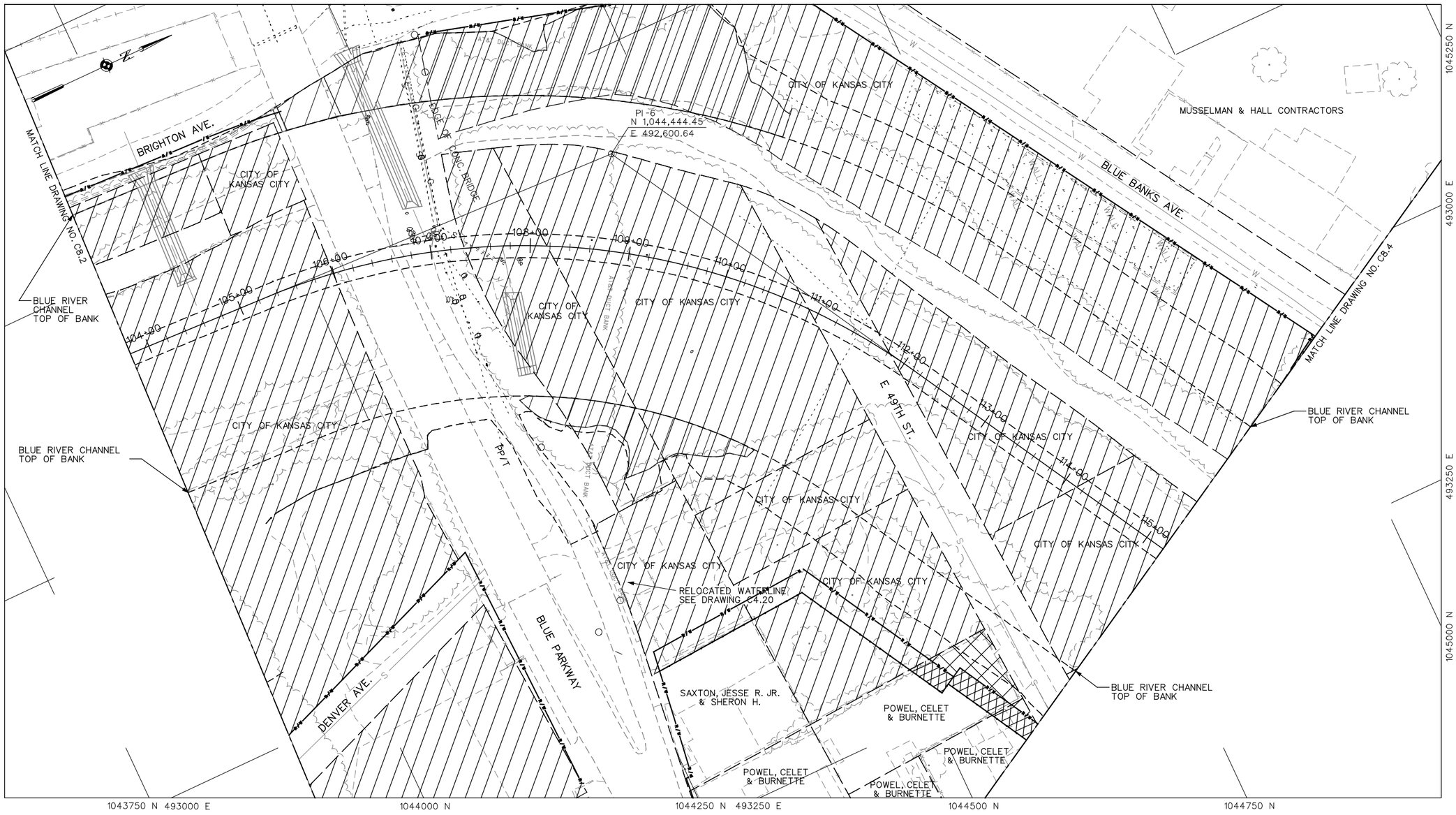
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPERTY OWNERSHIP AND UTILITIES

STA. 90+80 TO STA. 103+80

Sheet Reference Number:
C8.2



PLAN

50' 0 50' 100'

SCALE: 1" = 50'-0"

PROPERTY LINES, OWNERSHIPS AND EASEMENTS ARE REPRESENTATIVE ONLY. THE CONTRACTOR SHALL VERIFY PROPERTY LINE LOCATIONS, OWNERSHIPS AND EASEMENTS PRIOR TO CONSTRUCTION TO ENSURE THAT CONSTRUCTION IS WITHIN THE APPROPRIATE EASEMENTS AND THAT THE PERMANENT CHANNEL WORK IS WITHIN PERMANENT RIGHT OF WAY.

NOTE:
SHEET PROVIDED BY OTHERS

LEGEND:

- OWNED BY CITY OF KANSAS CITY
- PERMANENT RIGHT OF WAY
- TEMPORARY CONSTRUCTION EASEMENT
- TEMPORARY FILL EASEMENT

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: brc-c0803.dgn

Designed by: TJK, RD
Drawn by: JAS, MLW
Checked by: MWJ
Submitted by: TJK

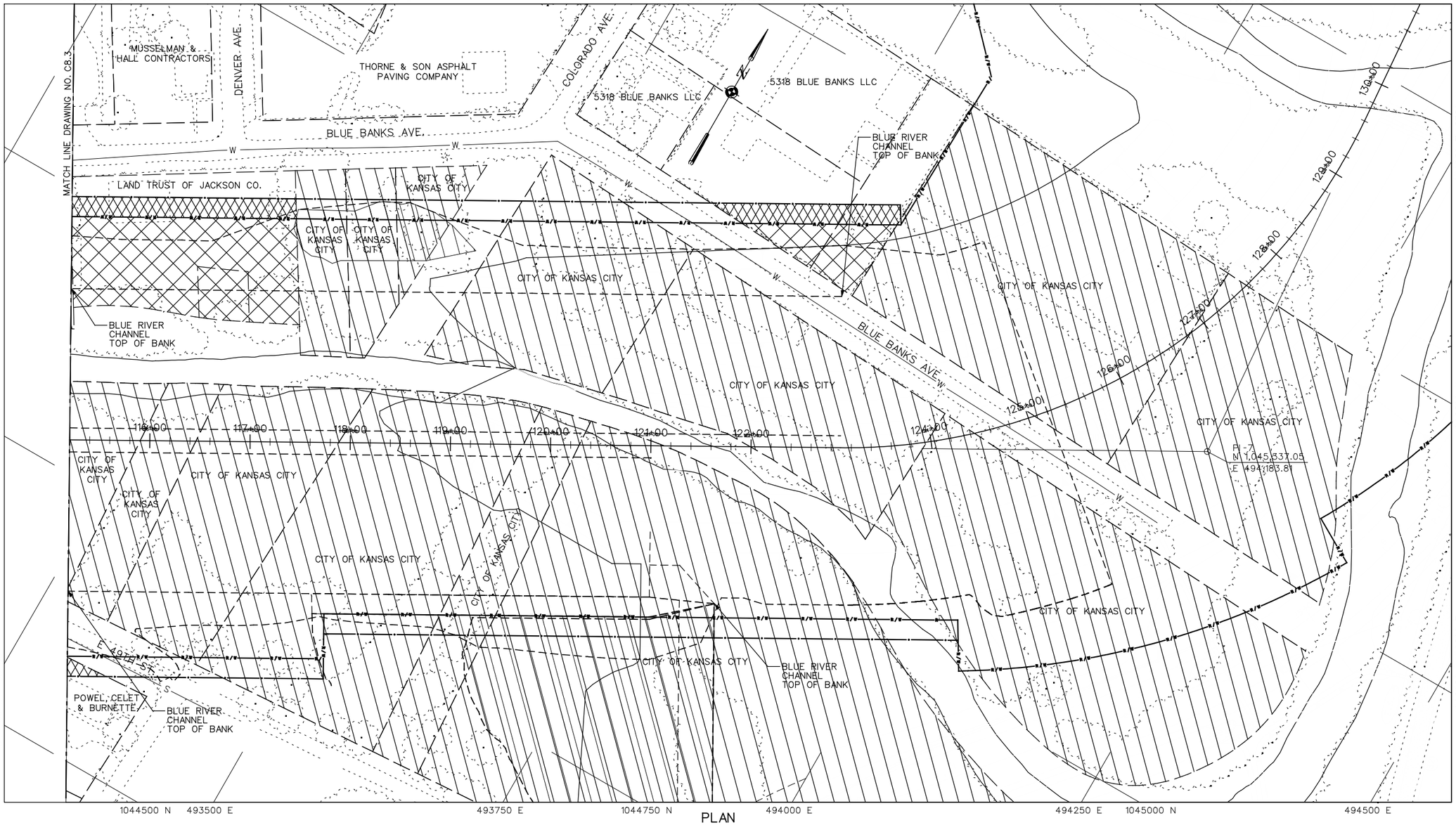
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

PROPERTY OWNERSHIP AND UTILITIES
STA. 103+80 TO STA. 115+20

Sheet Reference Number:
C8.3



PLAN

SCALE: 1" = 50'-0"

LEGEND:

- OWNED BY CITY OF KANSAS CITY
- PERMANENT RIGHT OF WAY
- TEMPORARY CONSTRUCTION EASEMENT
- TEMPORARY FILL EASEMENT

PROPERTY LINES, OWNERSHIPS AND EASEMENTS ARE REPRESENTATIVE ONLY. THE CONTRACTOR SHALL VERIFY PROPERTY LINE LOCATIONS, OWNERSHIPS AND EASEMENTS PRIOR TO CONSTRUCTION TO ENSURE THAT CONSTRUCTION IS WITHIN THE APPROPRIATE EASEMENTS AND THAT THE PERMANENT CHANNEL WORK IS WITHIN PERMANENT RIGHT OF WAY.

NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/20/08	

Date: AUGUST 2008
Drawing code:
Plot scale: 1" = 50'-0"
CADD File Name: bdxc0804.dgn

Designed by: T.K., RD
Drawn by: JAS, MLW
Checked by: MJW
Submitted by: T.K.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

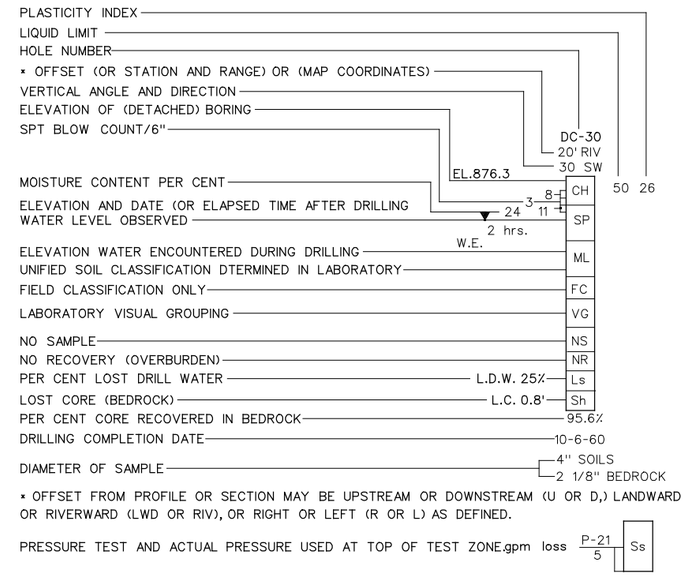
PROPERTY OWNERSHIP AND UTILITIES STA. 115+20 TO STA. 122+89.15BK (EQ.)

Sheet Reference Number:
C8.4

ABBREVIATIONS

alt	alternating	dmp	damp	lea	leached	rnd (d)	round, (rounded)
ang	angular	dol (c)	dolomite, (dolomitic)	lig	lignite	sat	saturated
an	anhydrite	ext	extremely	ls	limestone	scat	scattered
ar	argillaceous	f (y)	fine, (finely)	lt	light	sd (y)	sand, (sandy)
bdd	bed, bedded, bedding	fe	iron	lo	loose	sev	several
bdr	bedrock	fld	filled	L.C.	lost core	sh (y)	shale, (shaly)
bky	blocky	fm	firm	L.D.W.	lost drill water	si (y)	silt, (silty)
bl	blue	fos (s)	fossil, (fossiliferous)	med	medium	sis	siltstone
bld	boulder	frac (d)	fractures, (fractured)	mic	micaceous	sl	slightly
blk	black	frag (d)	fragments, (fragmented)	min	mineralized	slcs	siliceous
brec (d)	breccia, (brecciated)	fri	friable	mod (y)	moderate, (moderately)	slks	slickensides
brk	broken	fsl	fissile	mot	mottled	so	soft
brn	brown	gr	grain	mss	massive	sol (d)	solution, (solutionized)
c	coarse	gra	gradation	mst	moist	ss	sandstone
calc	calcareous	grn	green	mtl	material	st (g)	stained, (staining)
carb	carbonaceous	grv (y)	gravel, (gravelly)	mtx	matrix	stf	stiff
cav	cavity	gry	gray	nod	nodules	sty	stylolitic
cbl	cobble	gyp	gypsum	num	numerous	v	very
cht	chert	ha	high angle	occ (y)	occasional, (occasionally)	vert	vertical
circl	circulation	hd	hard	op	open	vgy	vuggy
cl (y)	clay, (clayey)	hld	healed	or	orange	w	water
cld	closed	hor	horizonal	org	organic	w/	with
cmtd	cemented	inbd	interbedded	par	partially	wth	weathered
col	columnar	incl	inclusions	pit	pit, pitted, pitting	wht	white
conc	concretions	inlam	interlaminated	pl	plastic	x-bdd	crossed-bedded
cong	conglomerate	irr	irregular	pla	platy	xln	crystalline
crm	crumbly	jt (s)	joint, (joints)	pln	plane	y	yellow
d	dense	la	low angle	ptg (s)	parting, (partings)	When used as log symbol	
dk	dark	lam (d)	laminae, (laminated)	qtz (e)	quartz, (quartzite)	first letter is capitalized	
				pbls	pebbles		

LEGEND OF LOGS OF BORINGS



* OFFSET FROM PROFILE OR SECTION MAY BE UPSTREAM OR DOWNSTREAM (U OR D,) LANDWARD OR RIVERWARD (LWD OR RIV), OR RIGHT OR LEFT (R OR L) AS DEFINED.

The symbol FC is used in the strip log column when the soil classification is limited to field classification at the time the sample was acquired in the field.

The symbol VG is used in the strip log column for those soil samples within a laboratory grouping of samples exhibiting similar soil properties but have not been subjected to Unified Soil Classification testing. At least one sample from the grouping subjected to Unified Soil Classification testing and is the basis for the descriptor adjacent VG.

UNIFIED SOIL CLASSIFICATION SYSTEM

GW	Well graded gravels, gravel-sand mixtures, little or no fines.
GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
GM	Silty gravels, gravel-sand-silt mixtures.
GC	Clayey gravels, gravel-sand-clay mixtures.
SW	Well-graded sands, gravelly sands, little or no fines.
SP	Poorly graded sands or gravelly sands, little or no fines.
SM	Silty sands, sand-silt mixtures.
SC	Clayey sands, sand-clay mixtures.
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts w/slight plasticity.
CL	Inorganic clays of low to mdium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
OL	Organic silts and organic silty clays of low plasticity.
MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
CH	Inorganic clays of high plasticity, fat clays.
OH	Organic clays of medium to high plasticity, organic silts.
Pt	Peat and other highly organic soils.

Classified from actual laboratory tests where LL and PI are shown.
Dual classication, where used, is in accordance with the Unified Soil Classification System.
For details on the Unified Soil Classification System, See Waterways Experiment Station.
Technical Memorandum No. 3-357 dated March 1953 and revised in 1960.

BEDROCK UNIT OF THICKNESS

Parting	<0.02'
Band	0.02' to 0.2'
Thin Bed	0.2' to 0.5'
Medium Bed	0.5' to 1.0'
Thick Bed	1.0' to 2.0'
Massive	>2.0'

TERMS FOR CONSISTENCY OF SOIL AND HARDNESS OF BEDROCK

SOIL

Consistency	Estimated Unconfined Compressive Strength (Tons per square foot)
Very soft	<0.25
Soft	0.25-0.5
Medium	0.5-1.0
Stiff	1.0-2.0
Very stiff	2.0-4.0
Hard	>4.0

BEDROCK

SCALE OF HARDNESS

Very soft or plastic	Can be indented easily with thumb.
Soft	Can be scratched with fingernail.
Moderately hard	Can be scratched easily with knife; cannot be scratched with fingernail.
Hard	Difficult to scratch with knife.
Very hard	Cannot be scratched with knife.

MAP SYMBOL

- VERTICAL BORING
- 30° INCLINED BORING SHOWING DIRECTION AND VERTICAL ANGLE
- CALYX BORING (30" DIAMETER OR LARGER)

TYPE OF EXPLORATION

CODE DESIGNATION

- D DRIVE SAMPLE HOLE
- C CORE HOLE
- TP TEST PIT (INCLUDES POWER AUGER 24" OR LARGER DIAMETER)
- U UNDISTURBED SAMPLE HOLE
- A AUGER HOLE-HAND OR POWER AUGER LESS THAN 24" DIAMETER.
- NS NOT SAMPLED (FIELD CLASSIFICATION FROM CUTTINGS ONLY
- FS FIELD SECTION OF OUTCROP.
- P PERMANENT PIEZOMETER

NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawing code:
Plot scale:
Drawn by:
Checked by:
Submitted by: T.K.
CADD File Name: brsgp100.dgn

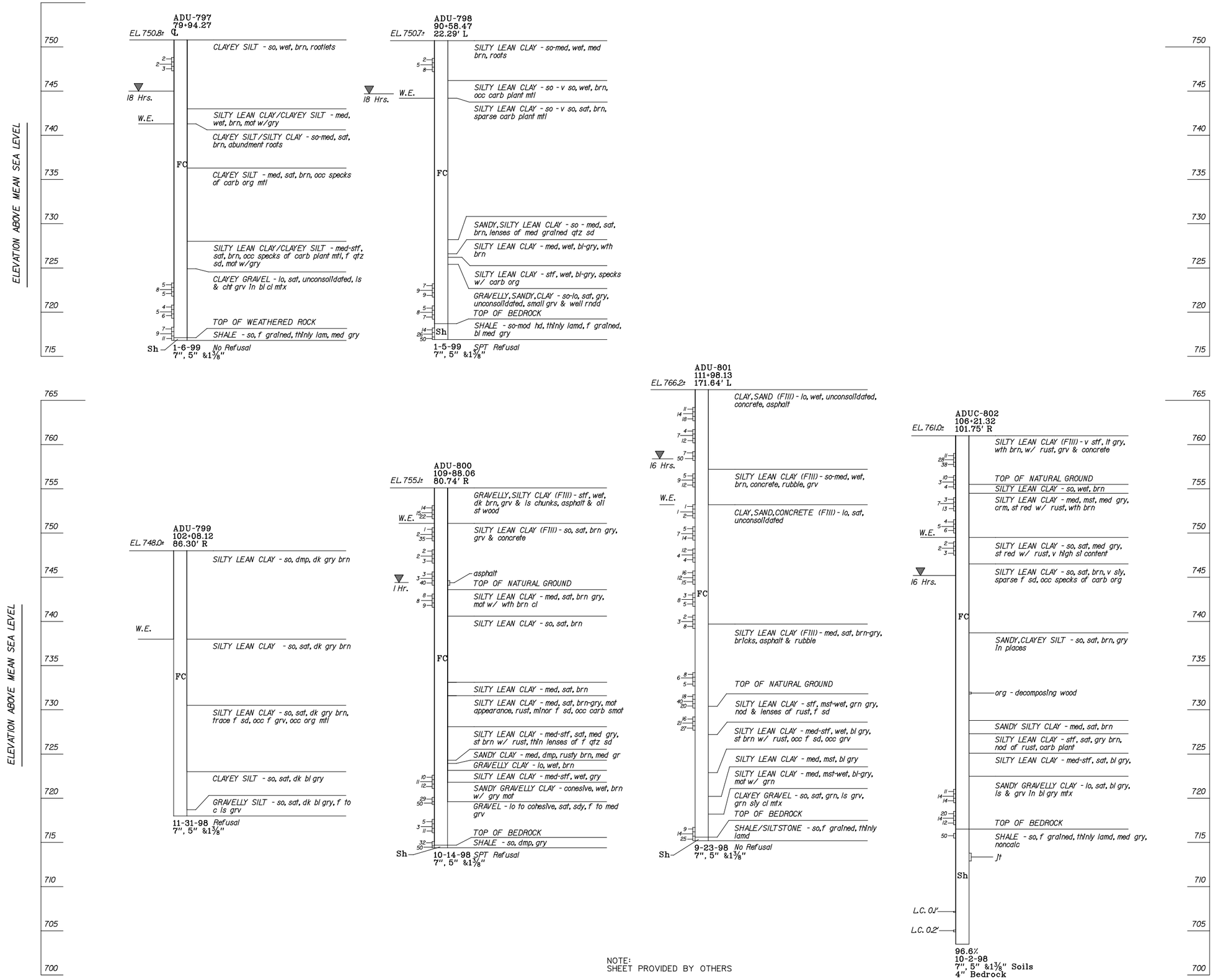
U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

LEGEND OF BORINGS AND ABBREVIATIONS

Sheet Reference Number:
G1.0



NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1 PREFINAL - FOR REVIEW		08/06/08	

Designed by:
Date: AUGUST 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: TJK
CADD File Name: bridge01.dgn

U.S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

UNDERGROUND EXPLORATION
AND DETACHED BORINGS
SHEET 1

Sheet Reference Number:
G1.1

NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawing code:
Drawn by:
Plot scale:
Checked by:
CADD File Name: bkrsgp1102.dgn
Submitted by: TJK

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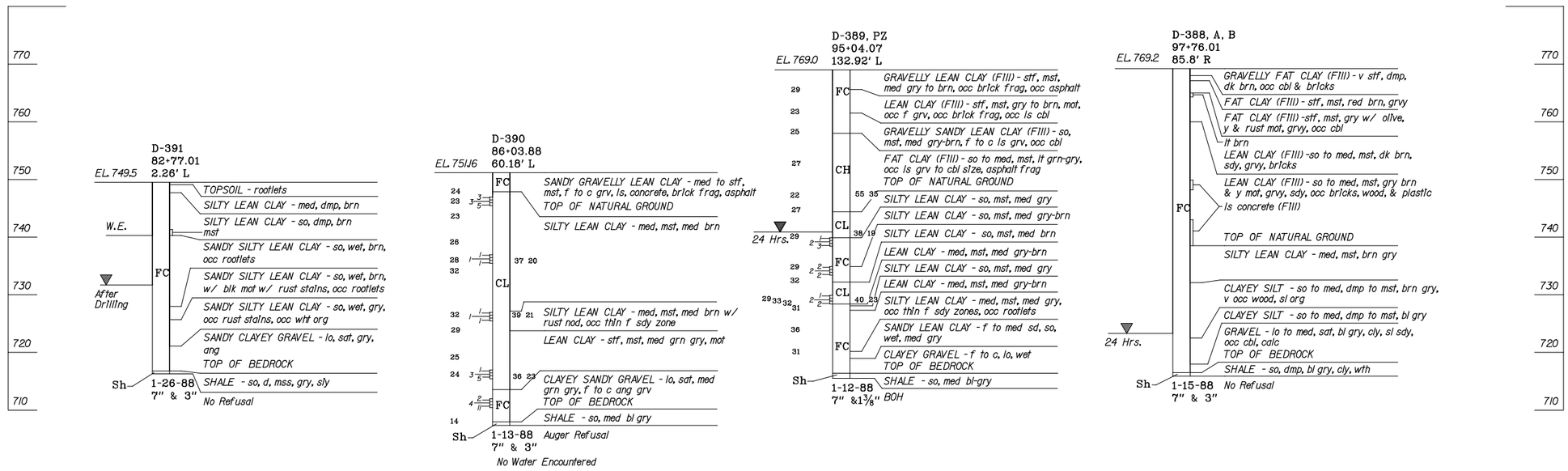
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET
UNDERGROUND EXPLORATION
AND DETACHED BORINGS
SHEET 2

Sheet Reference Number:
G1.2



NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: TJK
CADD File Name: brsg010.dgn

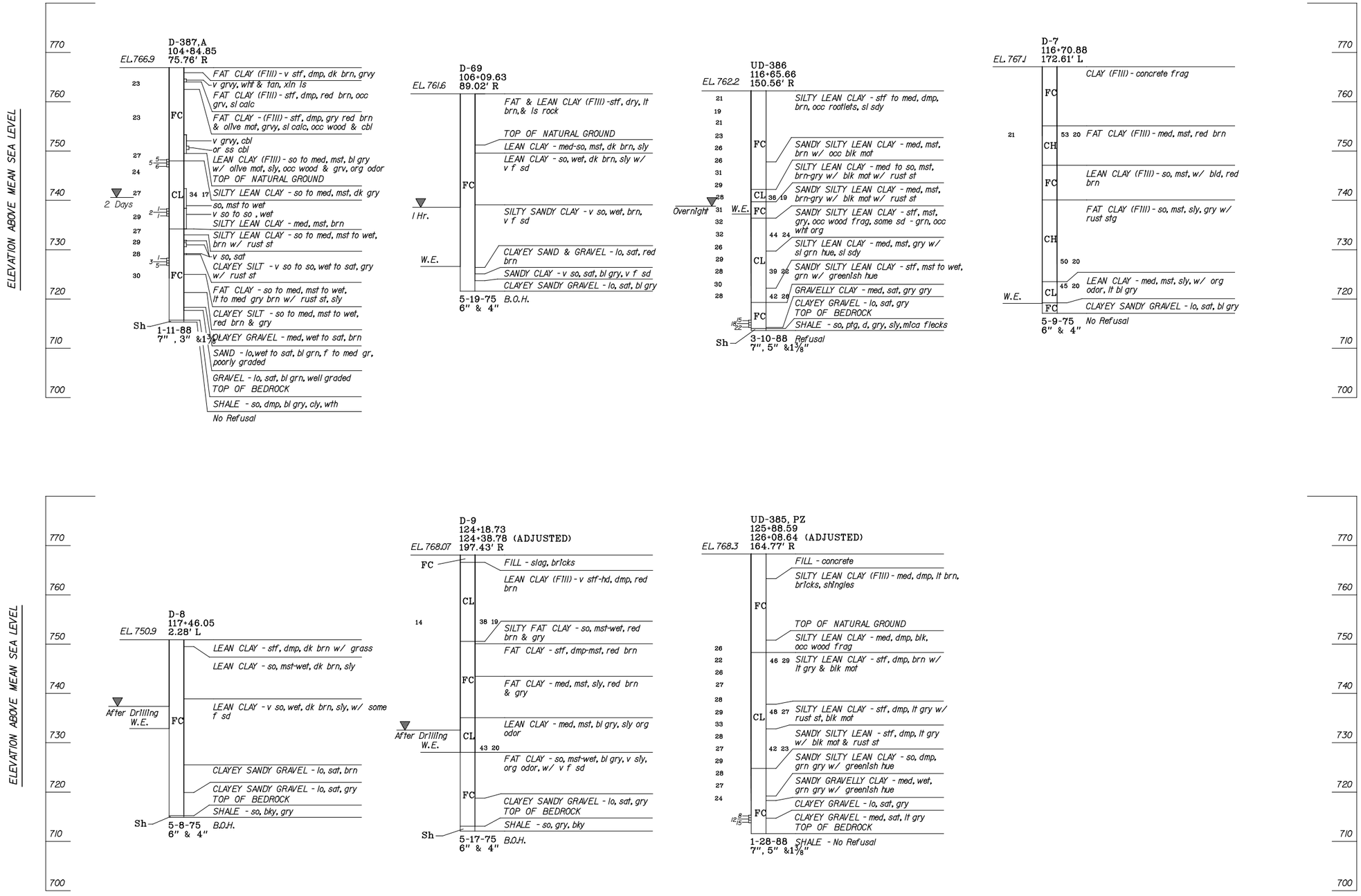
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR
HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER MAINSTEM
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

UNDERGROUND EXPLORATION
AND DETACHED BORINGS
SHEET 3

Sheet Reference Number:
G1.3



NOTE:
SHEET PROVIDED BY OTHERS

US Army Corps of Engineers
Kansas City District

Symbol	Description	Date	Appr.
1 PRELIMINARY - FOR REVIEW		08/06/08	

Designed by:
Date: AUGUST 2008
Drawing code:
Drawn by:
Plot scale:
Checked by:
CADD File Name: bregp104.dgn
Submitted by: TJK

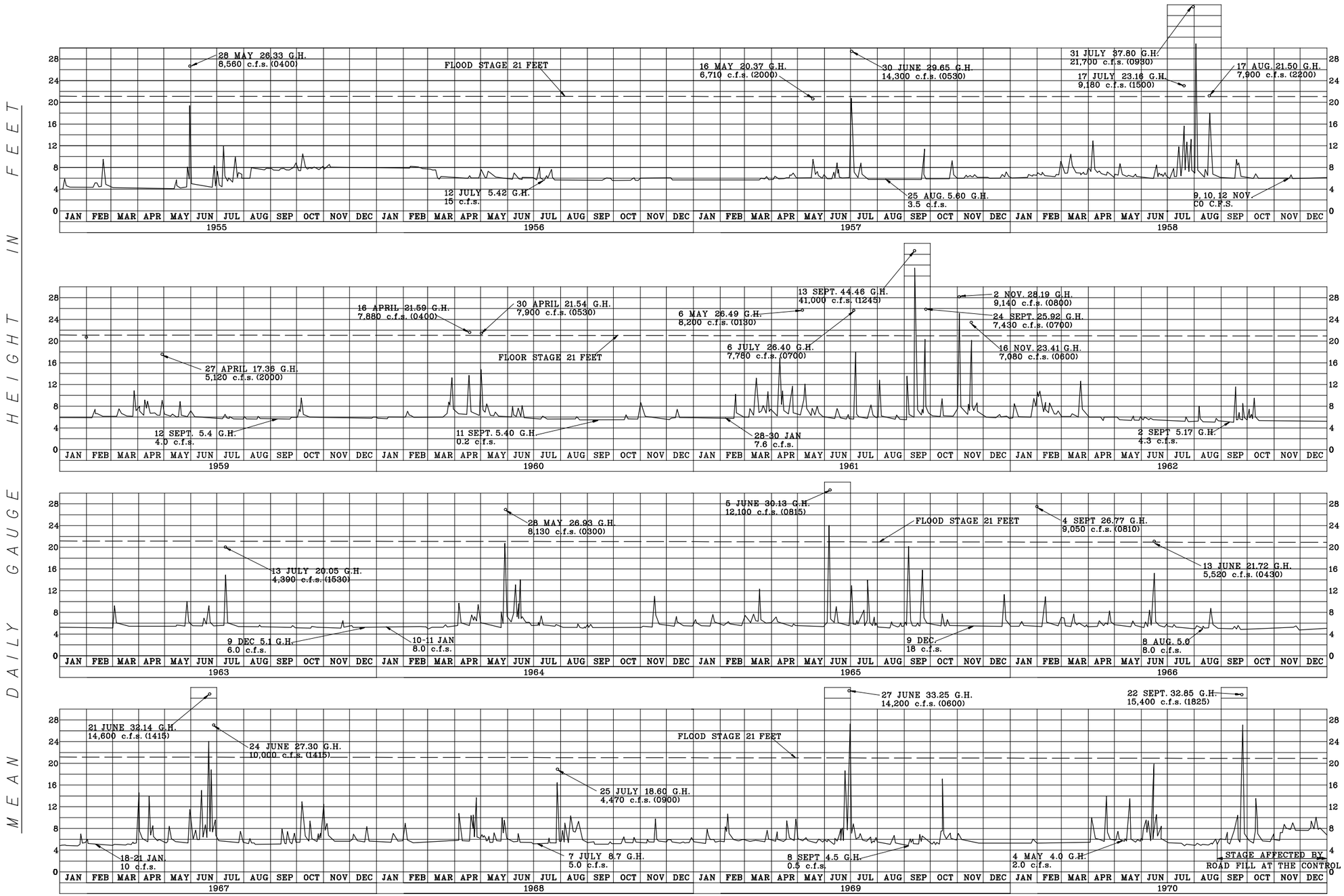
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

HDR Engineering, Inc.

FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

UNDERGROUND EXPLORATION AND DETACHED BORINGS SHEET 4

Sheet Reference Number:
G1.4



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1	PRELIMINARY - FOR REVIEW	08/06/08	

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Submitted by: TJK
Date: AUGUST 2008
Drawing code:
Plot scale:
CADD File Name: bxb010.dgn

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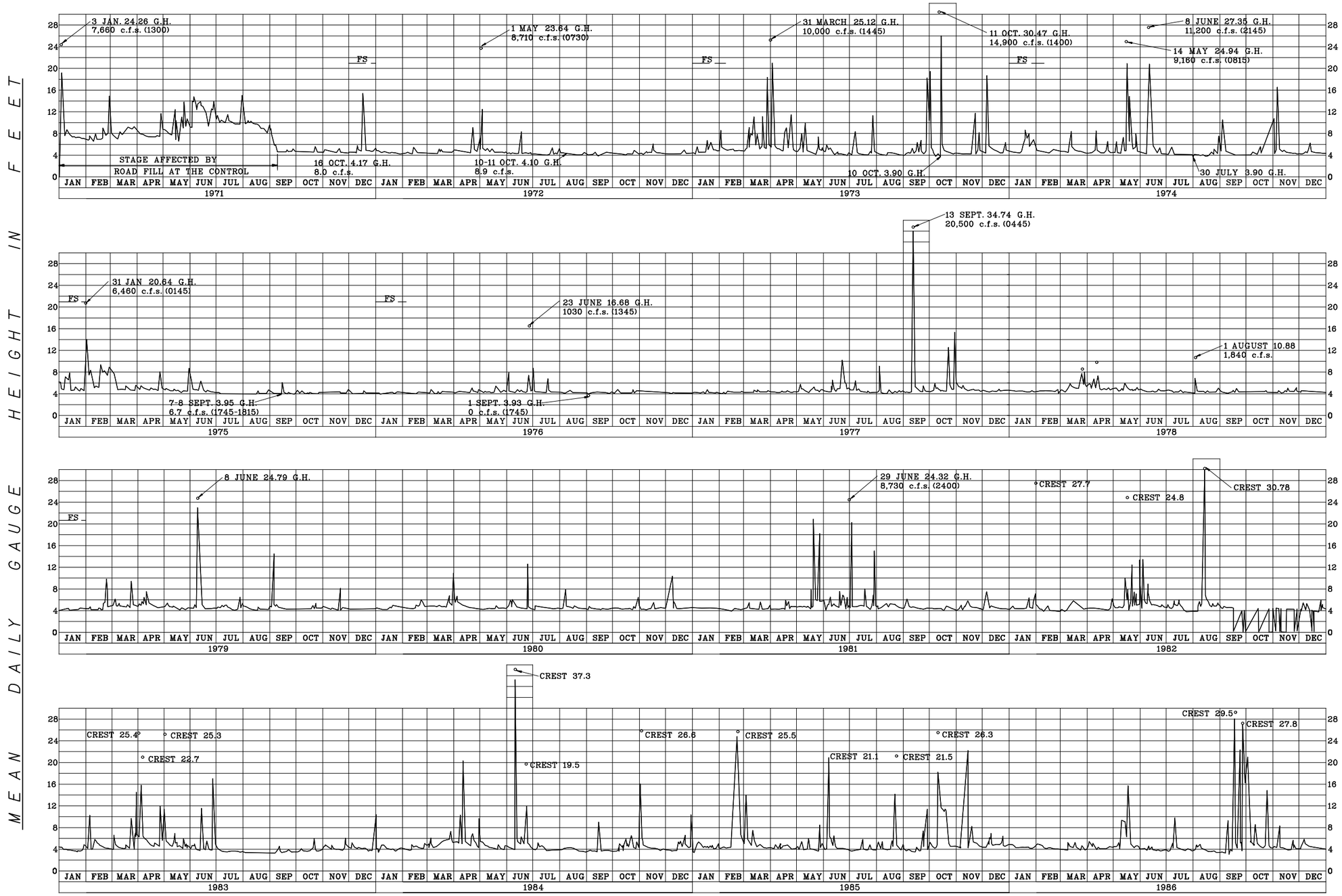
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

BLUE RIVER HYDROGRAPH
NEAR KANSAS CITY

Sheet Reference Number:
H1.1



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Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
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Drawing code:
Checked by:
Plot scale:
Submitted by: TJK
CADD File Name: brdh0102.dgn

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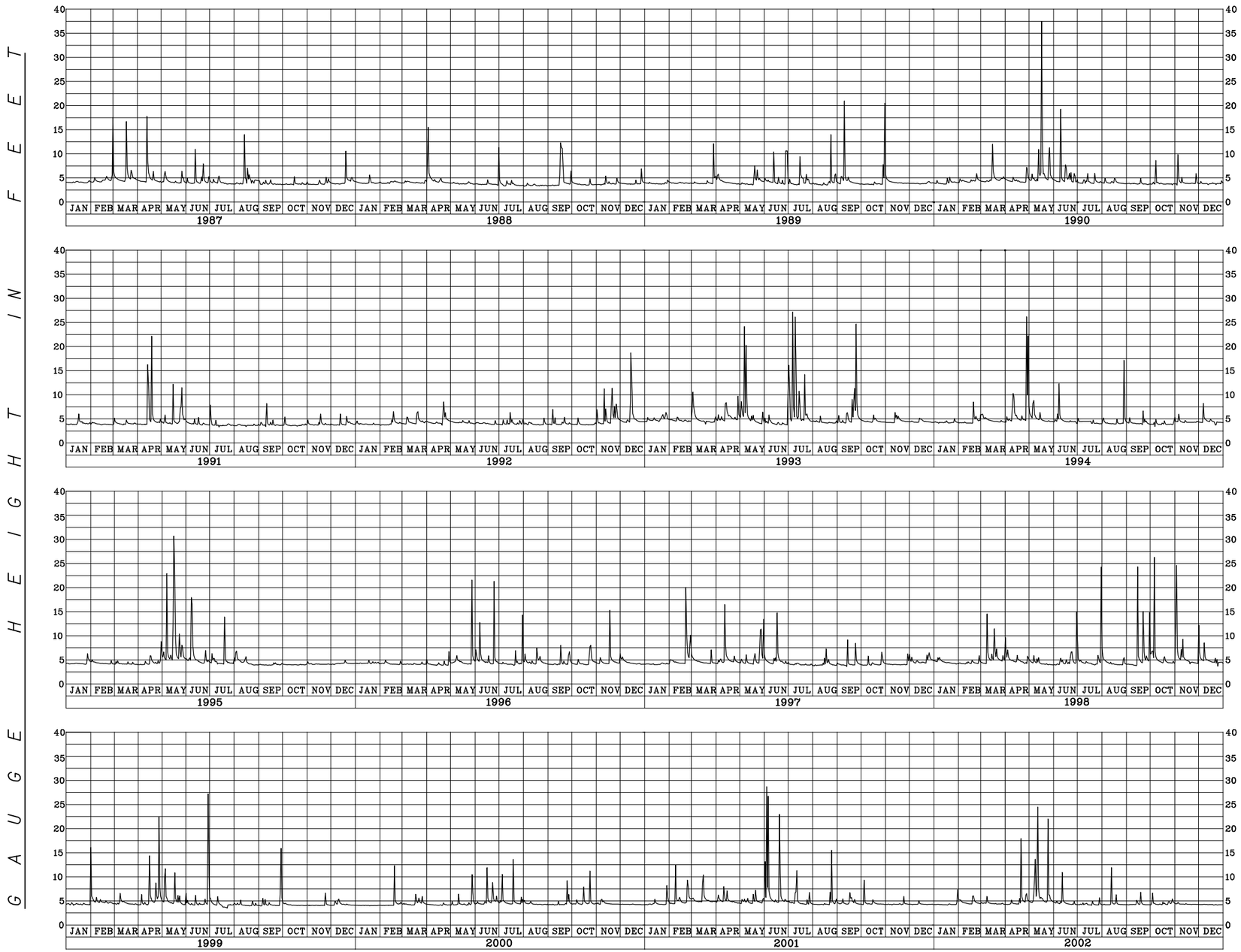
FLOOD PROTECTION PROJECT
BLUE RIVER VALLEY
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

BLUE RIVER HYDROGRAPH
NEAR KANSAS CITY

Sheet Reference Number:
H1.2



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Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Drawn by:
Checked by:
Submitted by: JK

Date: AUGUST 2008
Drawing code: BEL-1-1405
Plot scale:
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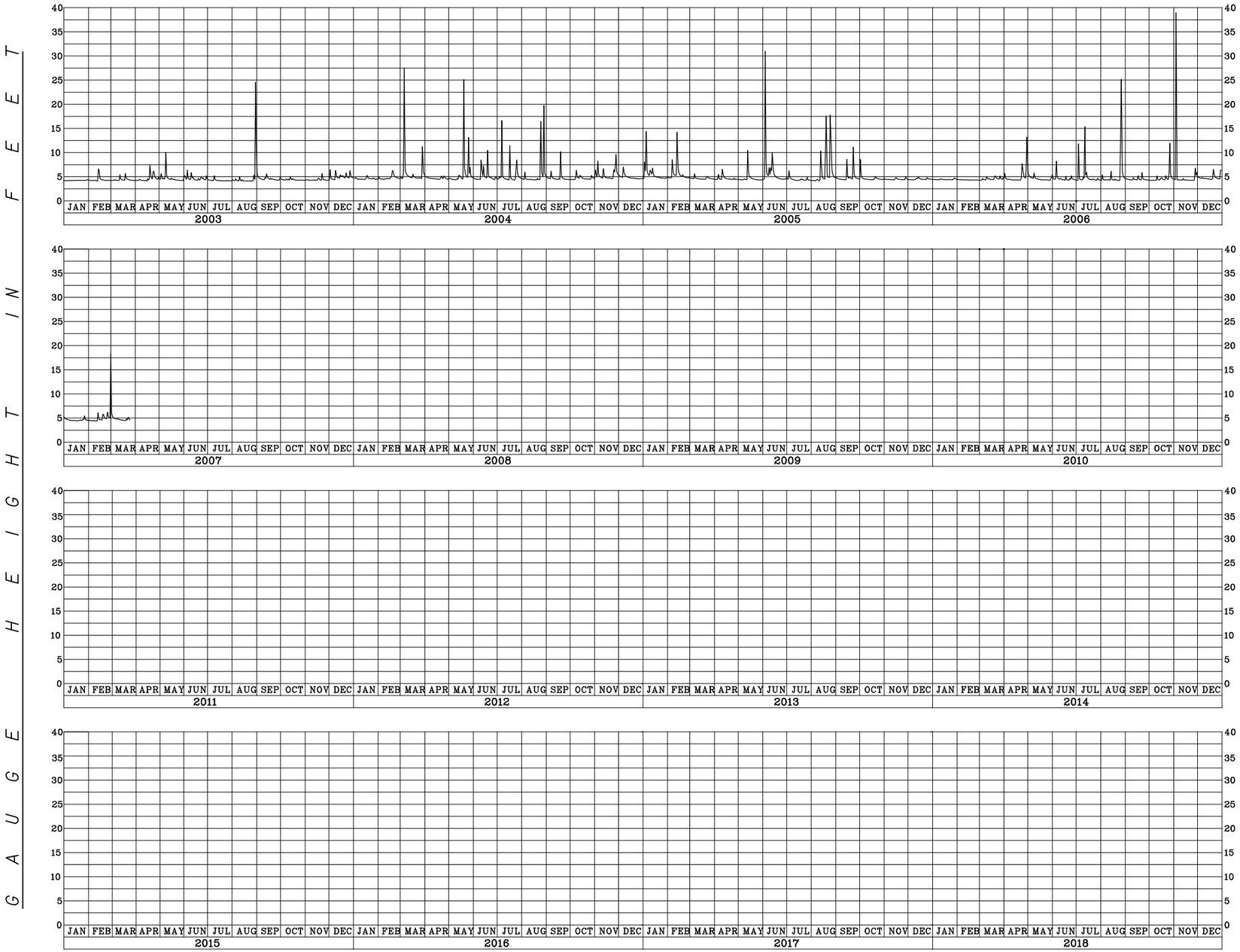
FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

BLUE RIVER HYDROGRAPH
NEAR KANSAS CITY

Sheet Reference Number:
H1.3



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Kansas City District

Symbol	Description	Date	Appr.
1	PRELIMINARY - FOR REVIEW	08/06/08	

Designed by:
Date: AUGUST 2008
Drawn by:
Drawing code:
Checked by:
Plot scale:
Submitted by: LAK
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FLOOD PROTECTION PROJECT
BLUE RIVER CHANNEL
KANSAS CITY, MISSOURI
BRUSH CREEK TO 53RD STREET

BLUE RIVER HYDROGRAPH
NEAR KANSAS CITY

Sheet Reference Number:
H1.4