TRANSPORTATION CABINET
Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

December 9, 2014

CALL NO. 108
CONTRACT ID NO. 141071
ADDENDUM # 1

Subject: Perry County, IBRC 1003 (249)
Letting December 12, 2014

(1) Revised – Plan Sheets – U1, U2, & U3
(2) Revised – Waterline Specifications – Pages 31-51 of 151
(3) Revised – Bid Items - Pages 149-151 of 151

Proposal revisions are available at http://transportation.ky.gov/Construction-Procurement/.

Plan revisions are available at http://www.lynnimaging.com/kytransportation/.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

Diana Castle Radcliffe

Diana Castle Radcliffe
Director
Division of Construction Procurement

DR:ks
Enclosures

COUNTY OF	ITEM NO.	SHEET NO.
PERRY	10-1095.00	U1

SHEET NOTES:
1) CONTR. TO DETERMINE, AS MUCH AS PRACTICAL BY HOMEOWNER INTERVIEW, WHERE EXIST. SERV. IS. CONTR. SHALL NOT DAMAGE LEACH LINES OR IF DAMAGED REPAIR TO HOMEOWNER SATISFACTION, NO EXTRA PAY.
2) ENSURE PANEL MOUNT IS WITHIN HWY. R/W.
3) CONST. WATERLINE CLOSE TO FENCE; DO NOT DAMAGE.
4) TEMP. SERV. RETIE PAID AS STANDARD SERVICE RETIE.
5) SHOWN AS 10" DIA.; SHOULD CONTR. BE UNABLE TO LOCATE SUITABLE CASING SPACERS FOR THIS CARRIER / LINER COMBINATION USE 12" OPEN CUT LINER PIPE, NO EXTRA PAY.

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719 North Main Street
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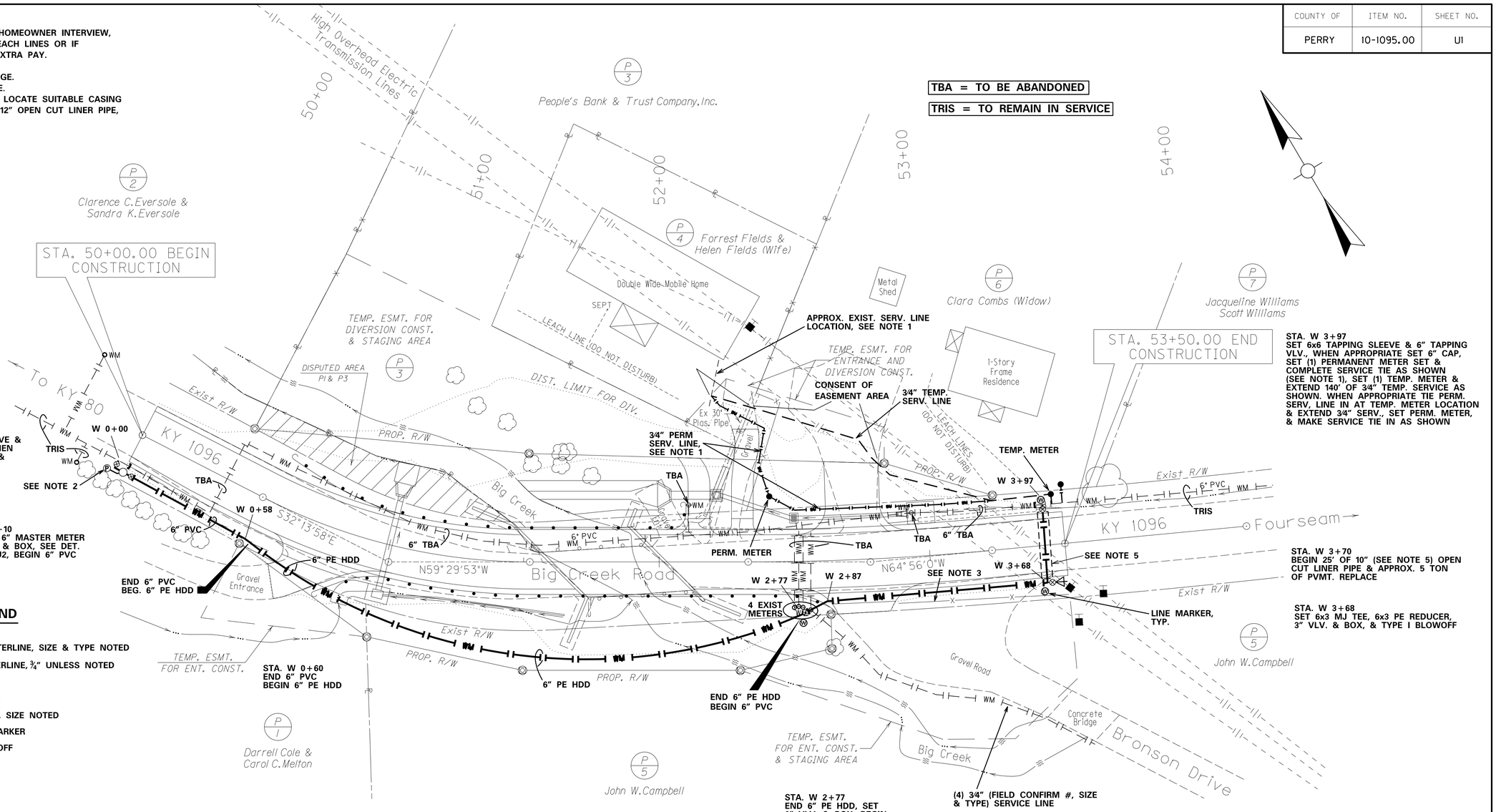
TBA = TO BE ABANDONED
TRIS = TO REMAIN IN SERVICE



WATER UTILITY RELOCATION LEGEND

WM	EXISTING WATERLINE
WM	PROPOSED MAINLINE WATERLINE, SIZE & TYPE NOTED
	PROPOSED SERVICE WATERLINE, ¾" UNLESS NOTED
○WM	EXISTING WATER METER
●	PROPOSED WATER METER
⊗	PROPOSED WATER VALVE, SIZE NOTED
Ⓦ	PROPOSED WATERLINE MARKER
⊳	PROPOSED TYPE II BLOWOFF
TBA	TO BE ABANDONED
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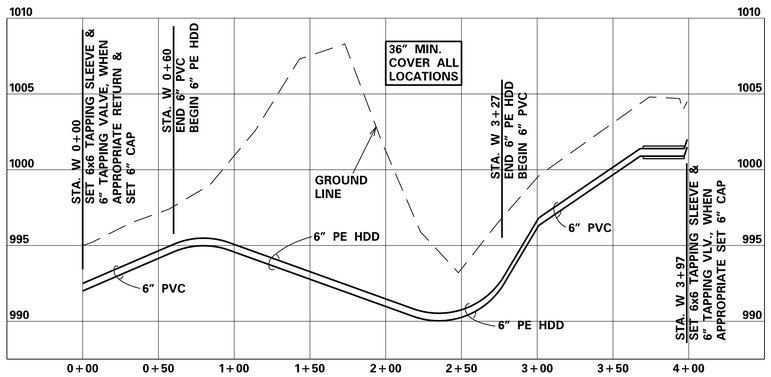

PROFILE – RELOCATED WATERLINE
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

GENERAL SUMMARY, NEW WATER UTILITIES

KYTC ITEM CODE	ITEM	UNIT	PLAN QTY.	AS BUILT QTY.	REMARKS
03385	6" PVC	LF	180		
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01067	10" OPEN CUT LINER PIPE	LF	25		SEE NOTE 5
01315	TYPE I BLOWOFF	EA	1		
03526	6" VALVE	EA	2		
03523	3" VALVE	EA	1		
23596EC	6x6 TAPPING SLEEVE & 6" TAPPING VALVE	EA	2		
03550	6" CAP	EA	2		
22866NN	TANDEM METER	EA	2		
22866NN	TEMP. TANDEM METER	EA	1		
24078EC	4 IN 6 MAG METER	EA	1		
04800	W.L. MARKERS	EA	4		
21269ND	SERVICE RETIE	EA	7		SEE NOTE 4
23300ED	CRUSHED STONE	TON	60		
23341EC	GENERAL CONCRETE	CYD	10		
23340EC	PAVEMENT REPLACEMENT	TON	5		

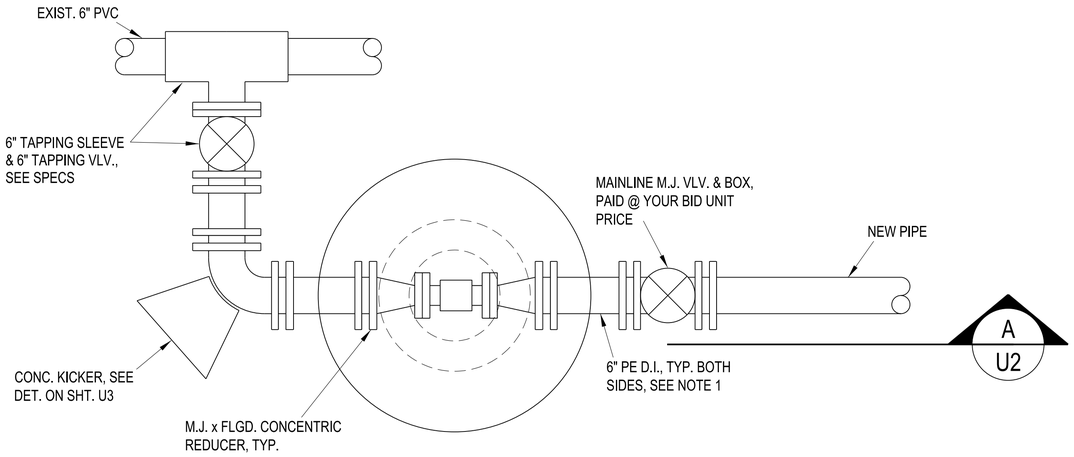
ITEMS TO BE ABANDONED	
6" PVC	360 LF
3/4" SERV. LINE	225 LF
METER SET	2 EA

U1

RECORD DATE 9 / 24 / 14 (REVISED 12 / 08 / 14)	KY 1096 BRIDGE REPLACEMENT WATER UTILITY RELOCATION CITY OF HAZARD, KENTUCKY
PROJECT NO. IBRD 1003 203 ITEM NO. 10-1095.00	COMMONWEALTH OF KENTUCKY KENTUCKY DEPARTMENT OF HIGHWAYS FRANKFORT, KENTUCKY
DRAWN BY. EH	
CHECKED BY: HAS	H. A. SPALDING ENGINEERS 651 SKYLINE DRIVE HAZARD, KENTUCKY 41701 – 1664
SCALE: NOTED	

FILE NAME: X:\ENGR\KY 10 1095 UTIL RELOU1.DGN
USER: Earl Hurt
DATE PLOTTED: September 25,2014
E-SHEET NAME:
MicroStation v8.11.7.443

COUNTY OF	ITEM NO.	SHEET NO.
PERRY	10–1095.00	U2

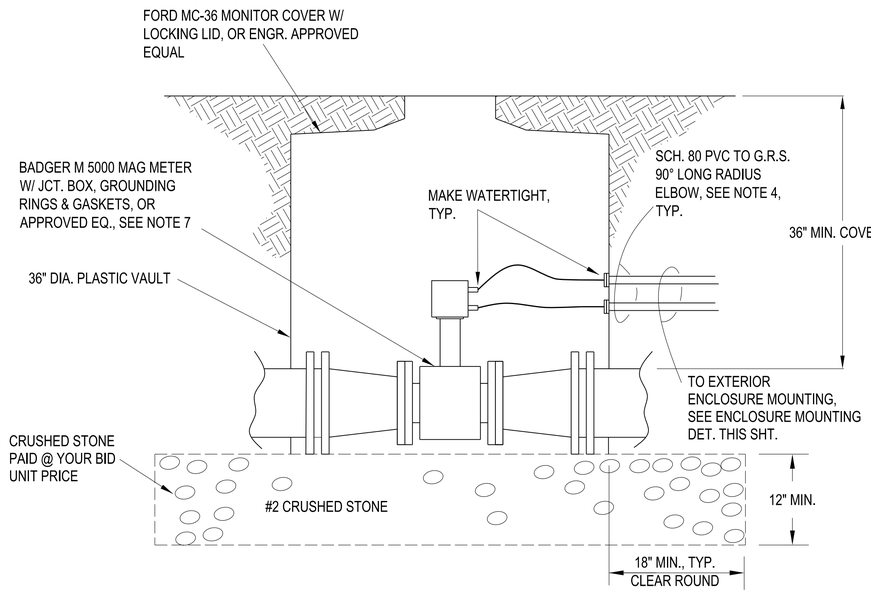


PLAN - MAG METER PLACEMENT

SCALE: NONE

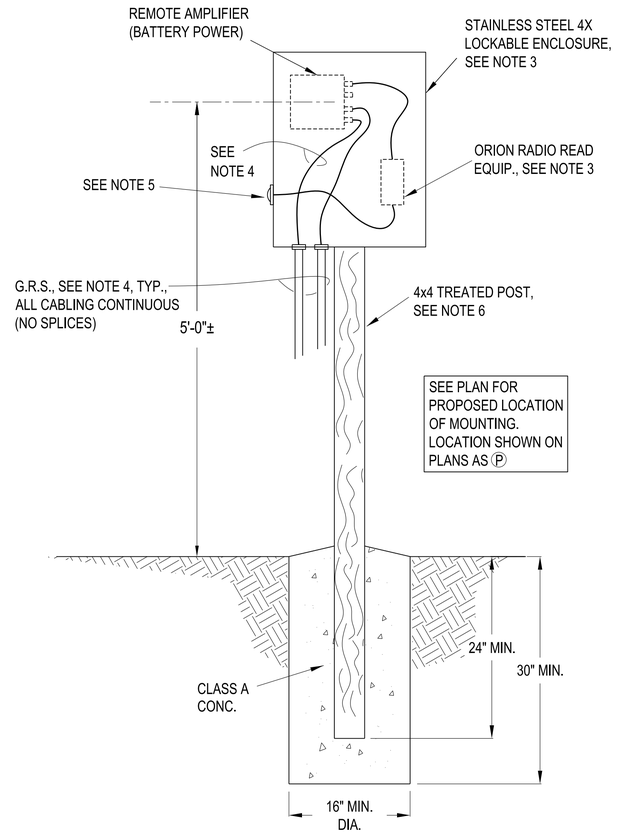
SHEET NOTES:

1) ALL SPOOL PIECES TO HAVE LAYING LENGTHS OF 3 TIMES THE DIAMETER OF THE LARGE SIDE OF THE CONCENTRIC REDUCER.
2) ORIENT METER PLACEMENT (FOR "PLUS" READING) GOING TOWARDS THE HEAD OF THE HOLLOW.
3) MAKE ENCLOSURE AS SMALL AS POSSIBLE WHILE STILL ALLOWING FOR THE INSTALLATION OF THE EQUIPMENT SHOWN AND/OR REQ.
4) SIZE OF CONDUITS/CABLING PER METER MFG. # OF CONDUITS/CABLES PER METER MFG. USE G.R.S. FROM ENCLOSURE TO 90° GRS ELL; SCH. 80 PVC FROM G.R.S. ELL TO VAULT. CABLES IN VAULT SHALL BE DESIGNED FOR SUBMERGED SERVICE. ALL CABLING SHALL BE CONTINUOUS (NO SPLICES) BETWEEN METER & ENCLOSURE MOUNTING.
5) INSTALL "THRU LID" METER READING OR OTHER DEVICES IF REQ. BY MFG.
6) MOUNT BOX ON 4x4 TO ENGRS. SATISFACTION. MOUNT ENTIRE ASSEMBLY WHERE DIRECTED BY ENGR. AND AS SHOWN ON PLAN.
7) METER & JCT. BOX SHALL BE DESIGNED FOR SUBMERGED SERVICE.
8) NOTE THAT ALL VLVS. (W/ EXCEPTION OF TAPPING VLVS.), CONCRETE, AND CRUSHED STONE INCLUDED IN THESE DETAILS SHALL BE PAID AT THEIR BID UNIT PRICE.
9) PROVIDE CONCRETE KICKERS PER STD. PRACTICE (SEE STD. SHT. FOR REQ.).



A / U2 SECTION - MAG METER

SCALE: NONE



DETAIL - EXTERIOR ENCLOSURE MOUNTING

SCALE: NONE

STATE OF KENTUCKY
HANK A. SPAULDING
17388
LICENSED PROFESSIONAL ENGINEER

Hank C. Spaulding

U2

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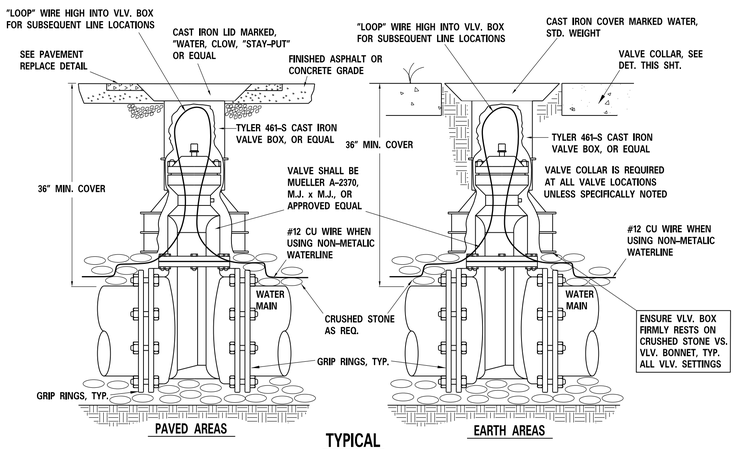
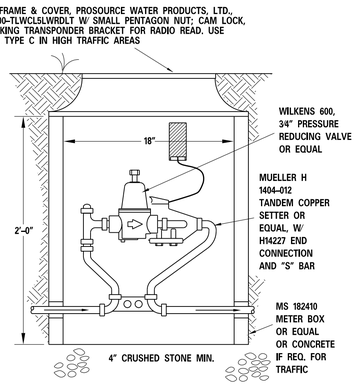


TYPICAL GATE VALVE SETTINGS



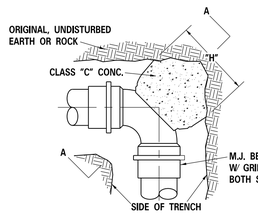
TYPICAL TANDEM METER SETTING

THRUST BLOCK DIMENSIONAL TABLE										
	FITTING									
	90° ELL		45° ELL		22.5° ELL		DEAD END		TEE, BRANCH SIZE	
PIPE SIZE	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"
2"	9"	15"	7"	10"	7"	7"	7"	13"	7"	13"
4"	19"	27"	13"	22"	9"	16"	15"	24"	15"	24"
6"	27"	43"	20"	32"	14"	23"	23"	36"	23"	36"
8"	36"	57"	27"	42"	19"	30"	31"	47"	31"	47"
10"	46"	70"	33"	53"	24"	37"	38"	60"	38"	60"
12"	55"	84"	40"	63"	29"	44"	46"	71"	46"	71"
14"	64"	98"	47"	73"	33"	53"	54"	83"	54"	83"
16"	73"	112"	54"	82"	38"	60"	62"	94"	62"	94"
18"	83"	125"	61"	92"	43"	67"	69"	107"	69"	107"
24"	110"	168"	81"	123"	58"	88"	93"	141"	93"	141"

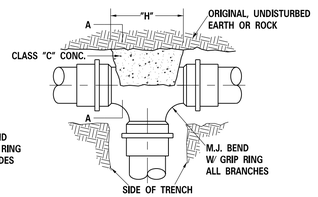
CONCRETE THRUST BLOCK

THRUST BLOCK & ANCHOR NOTES:
1) ALL TABLES ASSUME ALLOW. BEARING PRESS. OF 1,000 PSF; IF MUCKY SOILS CONTACT ENGR.
2) ALL TABLES ASSUME TEST PRESS. OF 200 PSI.
3) KEEP CONCRETE CLEAR OF ALL JT. ACCESSORIES OR USE 10 MIL VAPOR BARRIER.
4) PROVIDE JT. ENTRY & EXIST PIPES THAT ARE AS LONG AS PRACTICAL; GRIP RINGS AT EVERY JT., EVERY BRANCH.
5) MASTIC COAT REBAR FULL LENGTH BEFORE PLACING CONCRETE. LOOP BAR OVER JT. AS SHOWN, PROVIDE STD. HOOK.
6) ALL KICKERS TO BE FROM BOTTOM OF TRENCH TO A MIN. OF 2" ABOVE TOP OF PIPE.
7) ALL ANCHORS TO BE FULL WIDTH OT TRENCH. USE ANCHORS ON ALL GRADES STEEPER THAN 20%, 50' O.C.

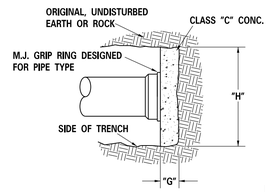
CONTRACTOR NOTE:
REFER TO SPECIAL NOTES OF SPECS. FOR GRIP RING REQUIREMENTS AT ALL FITTINGS.



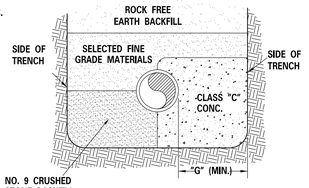
22°, 45°, & 90° BENDS



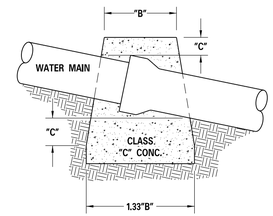
TEES



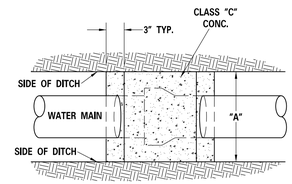
CAPS AND PLUGS



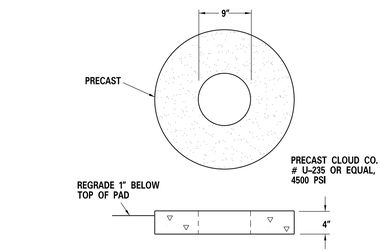
SECTION "A" – "A"

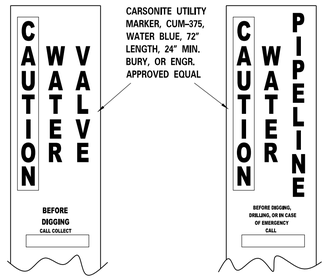


STRAIGHT PIPE SECTION



STRAIGHT PIPE PLAN



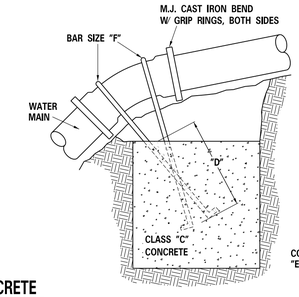


CARSONITE UTILITY MARKER, CUM-375, WATER BLUE, 72" LENGTH, 24" MIN. BURY, OR ENGR. APPROVED EQUAL

MARKER NOTES:
1) VALVE MARKERS TO BE PLACED AT EVERY INDIVIDUAL VALVE OR AT EACH VALVE GROUPING IF VALVES ARE LOCATED WITHIN 5' RADIUS OF EACH OTHER. COST FOR MARKERS TO BE INCLUDED IN UNIT COST OF VALVE.
2) PIPELINE MARKERS TO BE PLACED ON BOTH SIDES OF ANY CREEK OR DRAIN CROSSING WHICH IS PERENNIAL AS DETERMINED BY ENGINEER. ALSO, MARKERS TO BE PLACED ON BOTH SIDES OF ROAD BORES OR OPEN CUT LINER PIPE AND AT PIPE BENDS; COST FOR ALL TO BE INCLUDED IN PIPE UNIT PRICE.

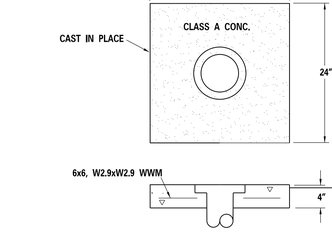
DETAIL - VALVE & LINE MARKERS

ANCHOR SCHEDULE					
PIPE SIZE	"B"	"C"	"D"	"E"	"F"
2"	12"	4"	12"	0.5	#3
3"	12"	4"	12"	0.5	#3
4"	12"	4"	12"	0.8	#3
6"	16"	6"	18"	1.5	#4
8"	16"	8"	24"	2.5	#5
10"	20"	12"	30"	4.5	#6
12"	24"	16"	30"	6.5	#6
>12"	CONTACT ENGINEER				

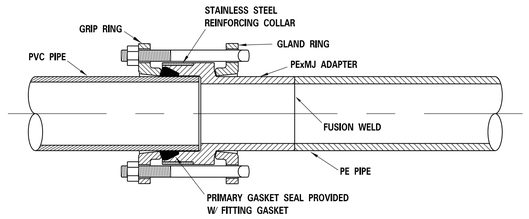


CONCRETE VOLUME "E" CYD

VERTICAL BEND



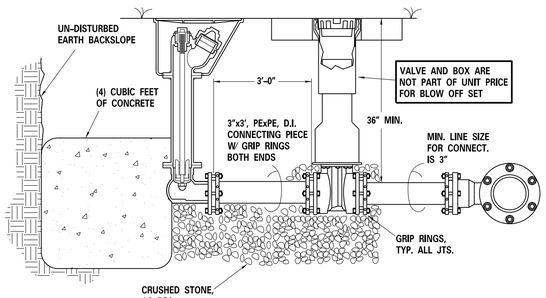
DETAIL - ALTERNATE VALVE COLLAR



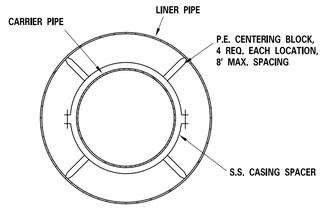
DETAIL - PE PIPE TO PVC PIPE WITH MJ ADAPTER

NOTES:
1) FLUSHING VALVE TO BE M&H STYLE 333 POST TYPE, 2-1/4" MAIN VALVE OPENING, W/ (1) 2-1/2" NATIONAL STD. THREAD HOSE NOZZLE (ONE WAY), AND 3" M.J. SHOE.
2) GATE VALVE TO BE MUELLER A-2370, 3", RESILIENT SEAT, M.J. X M.J., W/ TYLER 461-S VALVE BOX.

TYPICAL CONCRETE ANCHOR BLOCKS

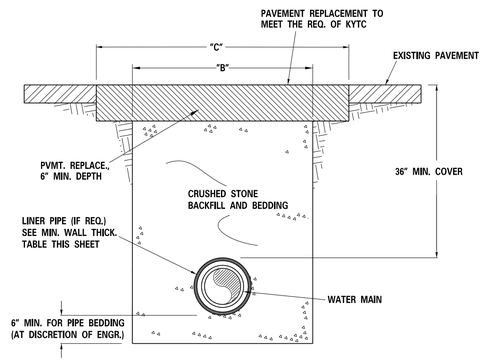


DETAIL - TYPE I BLOW-OFF ASSEMBLY

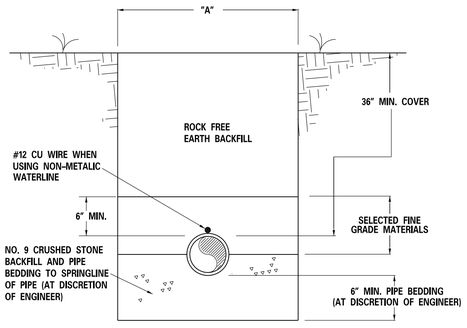


LINER PIPE DETAIL

LINER PIPE WALL THICKNESS TABLE	
PIPE SIZE	WALL THICKNESS
14" & UNDER	0.250
16"	0.281"
18"	0.312"
20" & 22"	0.344"
24"	0.375"
26"	0.406"
28"	0.438"
30"	0.469"
32"	0.500"



PAVED AREAS



OPEN AREAS

MAXIMUM TRENCH WIDTH			
PIPE SIZE	"A"	"B"	"C"
4" THRU 12"	30"	16"	40"
14" THRU 18"	36"	24"	48"
20" THRU 24"	42"	42"	66"
26" THRU 36"	54"	54"	78"

TYPICAL BACKFILL/BEDDING AND PAVEMENT REPLACEMENT METHODS

Hank A. Spaulding

U3

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SCALE:	

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USER: Earl Hurt
DATE PLOTTED: September 25,2014
E-SHEET NAME:
MicroStation v8.11.7.443

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REVISED 12-9-14

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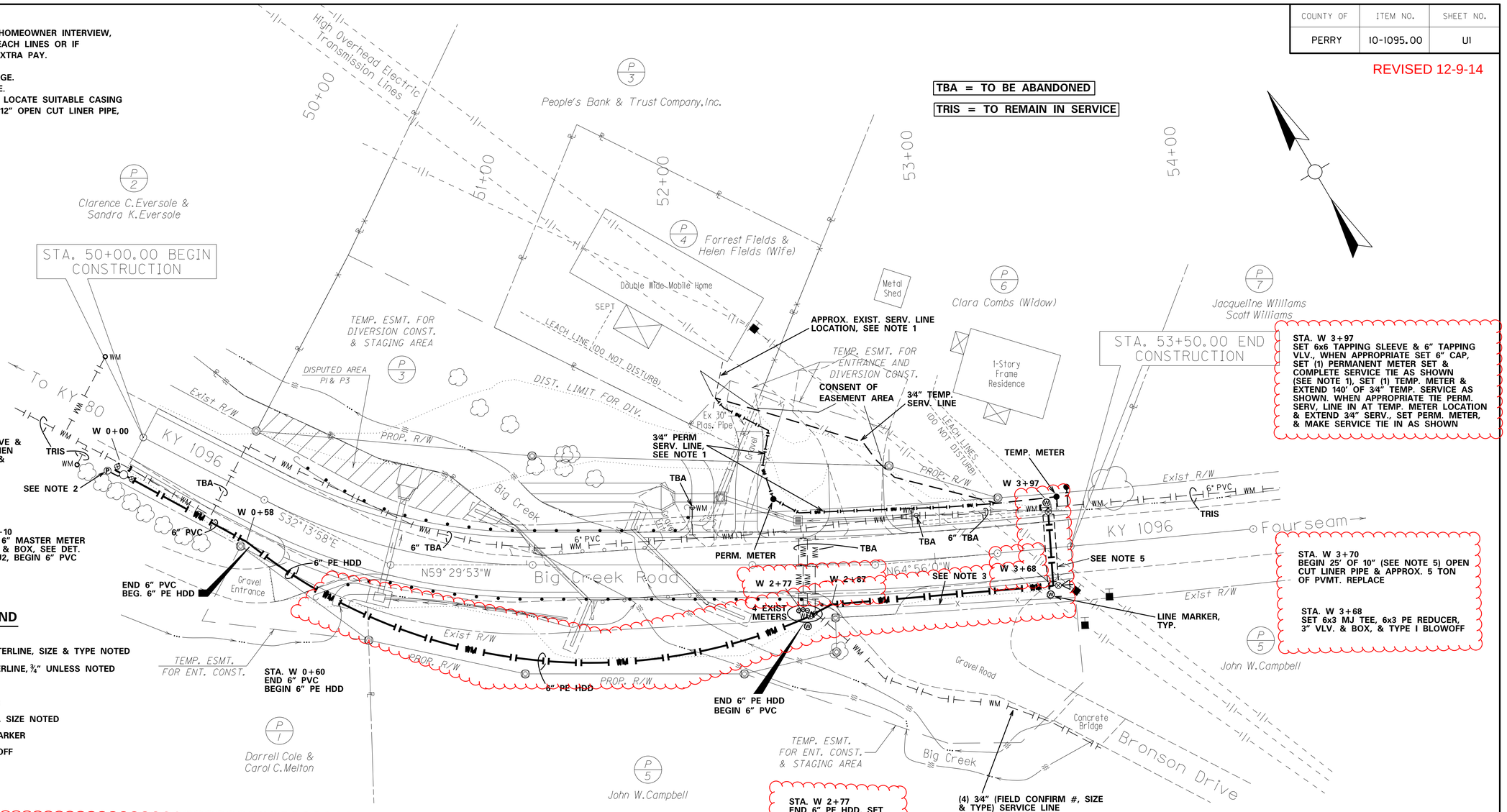

SCALE: 1"=20'
0' 20' 40' 80'

WATER UTILITY RELOCATION LEGEND

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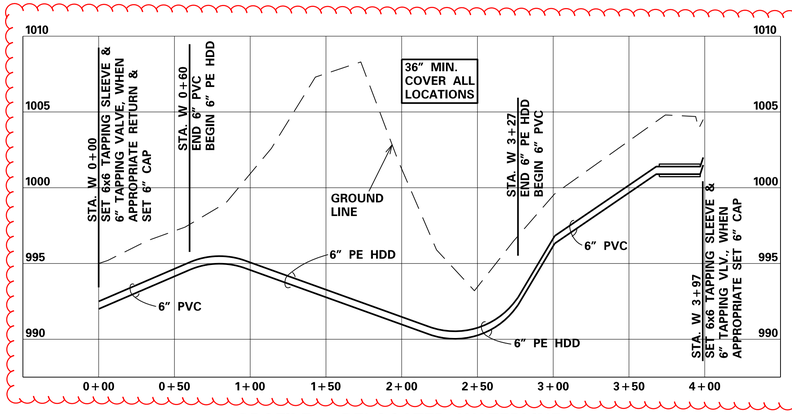

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22866NN	TEMP. TANDEM METER	EA	1		
24078EC	4 IN 6 MAG METER	EA	1		
04800	W.L. MARKERS	EA	4		
21269ND	SERVICE RETIE	EA	7		SEE NOTE 4
23300ED	CRUSHED STONE	TON	60		
23341EC	GENERAL CONCRETE	CYD	10		
23340EC	PAVEMENT REPLACEMENT	TON	5		

ITEMS TO BE ABANDONED	
6" PVC	360 LF
3/4" SERV. LINE	225 LF
METER SET	2 EA

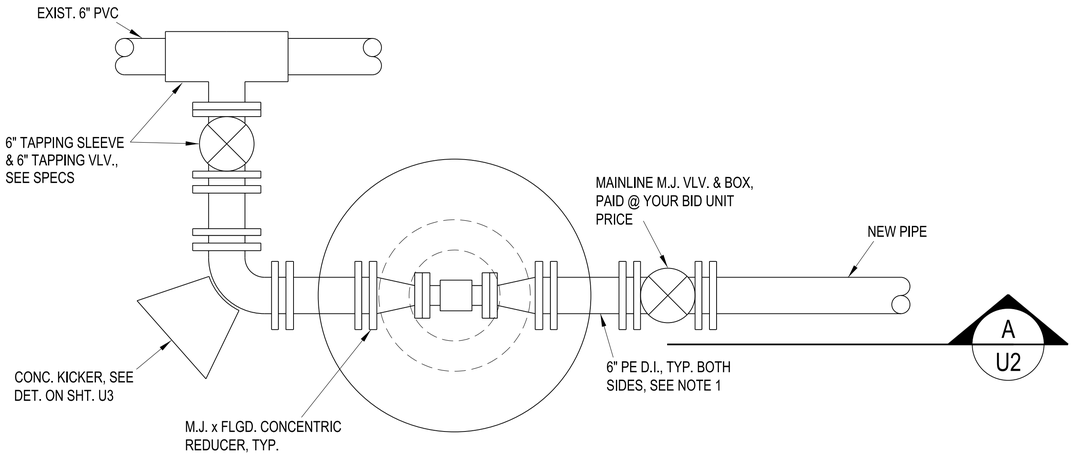
Hank C. Spaulding

U1

RECORD DATE 9 / 24 / 14 (REVISED 12 / 08 / 14)	KY 1096 BRIDGE REPLACEMENT WATER UTILITY RELOCATION CITY OF HAZARD, KENTUCKY
PROJECT NO. IBRD 1003 203 ITEM NO. 10-1095.00	COMMONWEALTH OF KENTUCKY KENTUCKY DEPARTMENT OF HIGHWAYS FRANKFORT, KENTUCKY
DRAWN BY. EH	
CHECKED BY: HAS	H. A. SPALDING ENGINEERS 651 SKYLINE DRIVE HAZARD, KENTUCKY 41701 – 1664
SCALE: NOTED	

FILE NAME: X:\ENGR\KY 10 1095 UTIL RELOU1.DGN
USER: Earl Hurt
DATE PLOTTED: September 25,2014
E-SHEET NAME:
MicroStation v8.11.7.443

COUNTY OF	ITEM NO.	SHEET NO.
PERRY	10–1095.00	U2

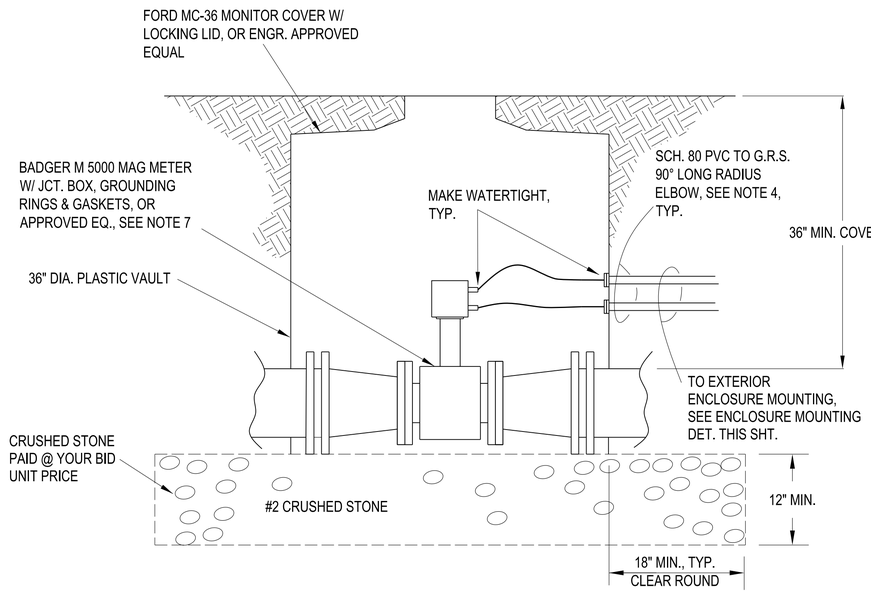


PLAN - MAG METER PLACEMENT

SCALE: NONE

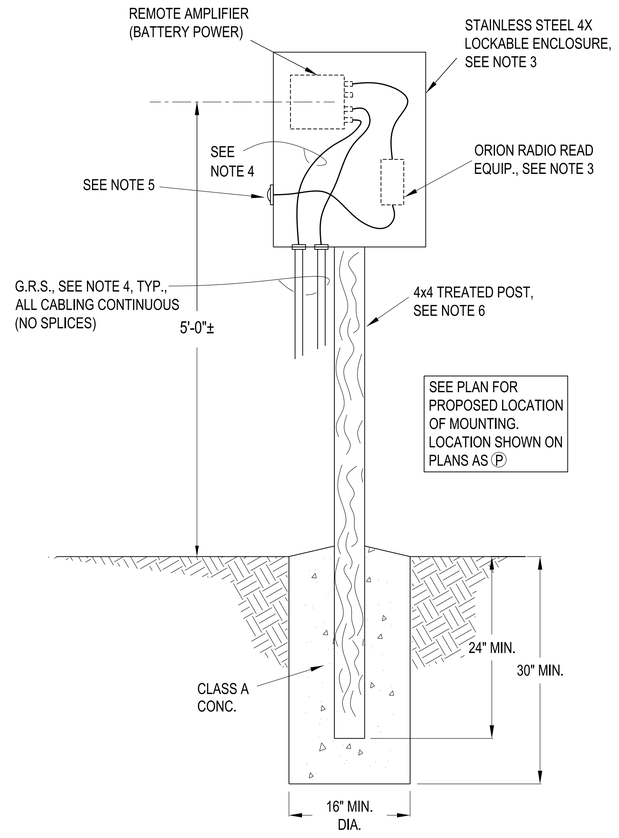
SHEET NOTES:

1) ALL SPOOL PIECES TO HAVE LAYING LENGTHS OF 3 TIMES THE DIAMETER OF THE LARGE SIDE OF THE CONCENTRIC REDUCER.
2) ORIENT METER PLACEMENT (FOR "PLUS" READING) GOING TOWARDS THE HEAD OF THE HOLLOW.
3) MAKE ENCLOSURE AS SMALL AS POSSIBLE WHILE STILL ALLOWING FOR THE INSTALLATION OF THE EQUIPMENT SHOWN AND/OR REQ.
4) SIZE OF CONDUITS/CABLING PER METER MFG. # OF CONDUITS/CABLES PER METER MFG. USE G.R.S. FROM ENCLOSURE TO 90° GRS ELL; SCH. 80 PVC FROM G.R.S. ELL TO VAULT. CABLES IN VAULT SHALL BE DESIGNED FOR SUBMERGED SERVICE. ALL CABLING SHALL BE CONTINUOUS (NO SPLICES) BETWEEN METER & ENCLOSURE MOUNTING.
5) INSTALL "THRU LID" METER READING OR OTHER DEVICES IF REQ. BY MFG.
6) MOUNT BOX ON 4x4 TO ENGRS. SATISFACTION. MOUNT ENTIRE ASSEMBLY WHERE DIRECTED BY ENGR. AND AS SHOWN ON PLAN.
7) METER & JCT. BOX SHALL BE DESIGNED FOR SUBMERGED SERVICE.
8) NOTE THAT ALL VLVS. (W/ EXCEPTION OF TAPPING VLVS.), CONCRETE, AND CRUSHED STONE INCLUDED IN THESE DETAILS SHALL BE PAID AT THEIR BID UNIT PRICE.
9) PROVIDE CONCRETE KICKERS PER STD. PRACTICE (SEE STD. SHT. FOR REQ.).



A / U2 SECTION - MAG METER

SCALE: NONE



DETAIL - EXTERIOR ENCLOSURE MOUNTING

SCALE: NONE

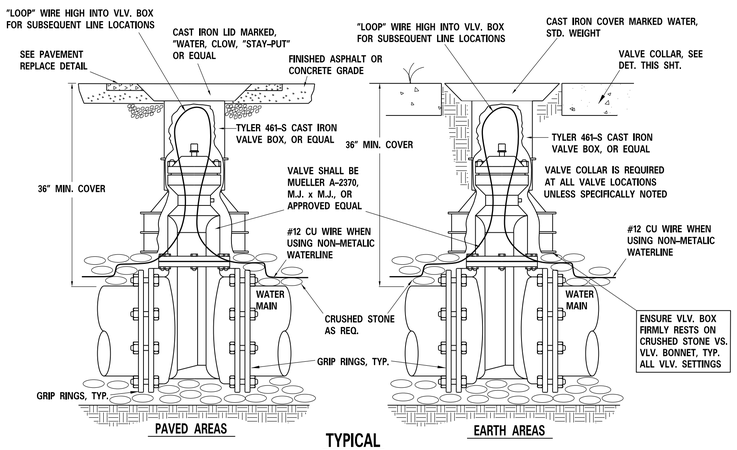
STATE OF KENTUCKY
HANK A. SPAULDING
17388
LICENSED PROFESSIONAL ENGINEER

Hank C. Spaulding

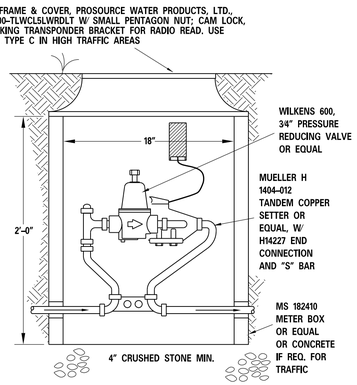
U2

RECORD DATE 9 / 23 / 14	KY 1096 BRIDGE REPLACEMENT WATER UTILITY RELOCATION CITY OF HAZARD, KENTUCKY
PROJECT NO. IBRD 1003 203 ITEM NO. 10–1095.00	COMMONWEALTH OF KENTUCKY KENTUCKY DEPARTMENT OF HIGHWAYS FRANKFORT, KENTUCKY
DRAWN BY. EH	
CHECKED BY: HAS	H. A. SPALDING ENGINEERS 651 SKYLINE DRIVE HAZARD, KENTUCKY 41701 – 1664
SCALE: NOTED	

COUNTY OF	ITEM NO.	SHEET NO.
PERRY	10–1095.00	U3



TYPICAL GATE VALVE SETTINGS



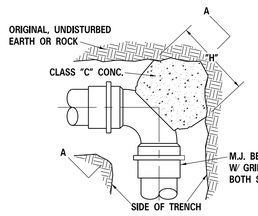
TYPICAL TANDEM METER SETTING

THRUST BLOCK DIMENSIONAL TABLE										
	FITTING									
	90° ELL		45° ELL		22.5° ELL		DEAD END		TEE, BRANCH SIZE	
PIPE SIZE	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"	DIM. "G"	DIM. "H"
2"	9"	15"	7"	10"	7"	7"	7"	13"	7"	13"
4"	19"	27"	13"	22"	9"	16"	15"	24"	15"	24"
6"	27"	43"	20"	32"	14"	23"	23"	36"	23"	36"
8"	36"	57"	27"	42"	19"	30"	31"	47"	31"	47"
10"	46"	70"	33"	53"	24"	37"	38"	60"	38"	60"
12"	55"	84"	40"	63"	29"	44"	46"	71"	46"	71"
14"	64"	98"	47"	73"	33"	53"	54"	83"	54"	83"
16"	73"	112"	54"	82"	38"	60"	62"	94"	62"	94"
18"	83"	125"	61"	92"	43"	67"	69"	107"	69"	107"
24"	110"	168"	81"	123"	58"	88"	93"	141"	93"	141"

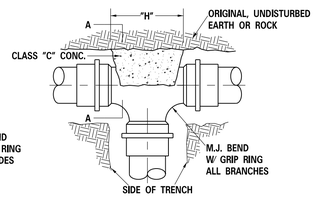
CONCRETE THRUST BLOCK

THRUST BLOCK & ANCHOR NOTES:
1) ALL TABLES ASSUME ALLOW. BEARING PRESS. OF 1,000 PSF; IF MUCKY SOILS CONTACT ENGR.
2) ALL TABLES ASSUME TEST PRESS. OF 200 PSI.
3) KEEP CONCRETE CLEAR OF ALL JT. ACCESSORIES OR USE 10 MIL VAPOR BARRIER.
4) PROVIDE JT. ENTRY & EXIST PIPES THAT ARE AS LONG AS PRACTICAL; GRIP RINGS AT EVERY JT., EVERY BRANCH.
5) MASTIC COAT REBAR FULL LENGTH BEFORE PLACING CONCRETE. LOOP BAR OVER JT. AS SHOWN, PROVIDE STD. HOOK.
6) ALL KICKERS TO BE FROM BOTTOM OF TRENCH TO A MIN. OF 2" ABOVE TOP OF PIPE.
7) ALL ANCHORS TO BE FULL WIDTH OT TRENCH. USE ANCHORS ON ALL GRADES STEEPER THAN 20%, 50' O.C.

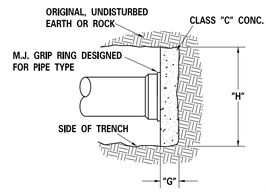
CONTRACTOR NOTE:
REFER TO SPECIAL NOTES OF SPECS. FOR GRIP RING REQUIREMENTS AT ALL FITTINGS.



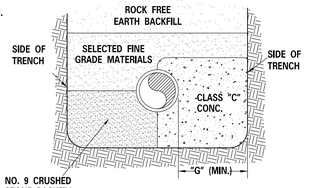
22°, 45°, & 90° BENDS



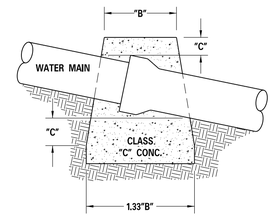
TEES



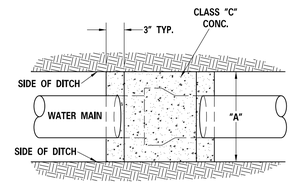
CAPS AND PLUGS



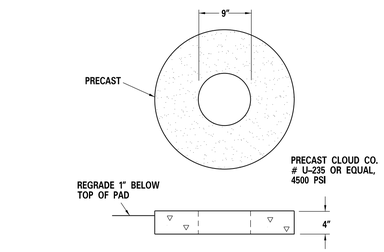
SECTION "A" – "A"

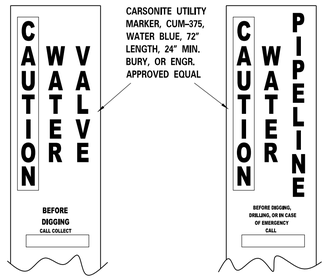


STRAIGHT PIPE SECTION



STRAIGHT PIPE PLAN



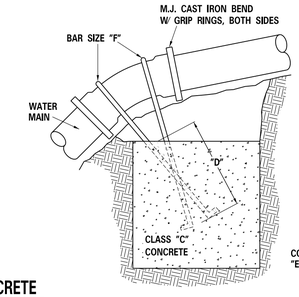


CARSONITE UTILITY MARKER, CUM-375, WATER BLUE, 72" LENGTH, 24" MIN. BURY, OR ENGR. APPROVED EQUAL

MARKER NOTES:
1) VALVE MARKERS TO BE PLACED AT EVERY INDIVIDUAL VALVE OR AT EACH VALVE GROUPING IF VALVES ARE LOCATED WITHIN 5' RADIUS OF EACH OTHER. COST FOR MARKERS TO BE INCLUDED IN UNIT COST OF VALVE.
2) PIPELINE MARKERS TO BE PLACED ON BOTH SIDES OF ANY CREEK OR DRAIN CROSSING WHICH IS PERENNIAL AS DETERMINED BY ENGINEER. ALSO, MARKERS TO BE PLACED ON BOTH SIDES OF ROAD BORES OR OPEN CUT LINER PIPE AND AT PIPE BENDS; COST FOR ALL TO BE INCLUDED IN PIPE UNIT PRICE.

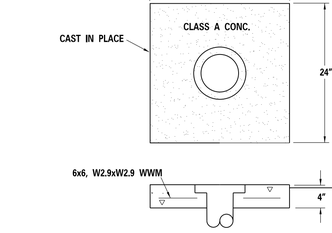
DETAIL - VALVE & LINE MARKERS

ANCHOR SCHEDULE					
PIPE SIZE	"B"	"C"	"D"	"E"	"F"
2"	12"	4"	12"	0.5	#3
3"	12"	4"	12"	0.5	#3
4"	12"	4"	12"	0.8	#3
6"	16"	6"	18"	1.5	#4
8"	16"	8"	24"	2.5	#5
10"	20"	12"	30"	4.5	#6
12"	24"	16"	30"	6.5	#6
>12"	CONTACT ENGINEER				

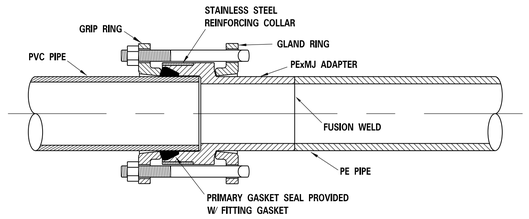


CONCRETE VOLUME "E" CYD

VERTICAL BEND



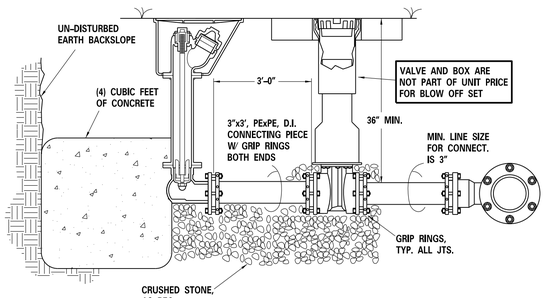
DETAIL - ALTERNATE VALVE COLLAR



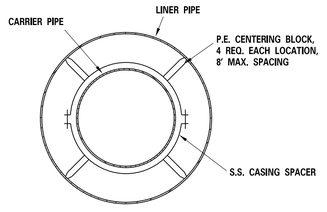
DETAIL - PE PIPE TO PVC PIPE WITH MJ ADAPTER

NOTES:
1) FLUSHING VALVE TO BE M&H STYLE 333 POST TYPE, 2-1/4" MAIN VALVE OPENING, W/ (1) 2-1/2" NATIONAL STD. THREAD HOSE NOZZLE (ONE WAY), AND 3" M.J. SHOE.
2) GATE VALVE TO BE MUELLER A-2370, 3", RESILIENT SEAT, M.J. X M.J., W/ TYLER 461-S VALVE BOX.

TYPICAL CONCRETE ANCHOR BLOCKS

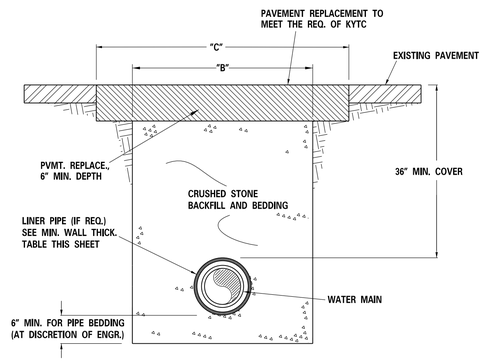


DETAIL - TYPE I BLOW-OFF ASSEMBLY

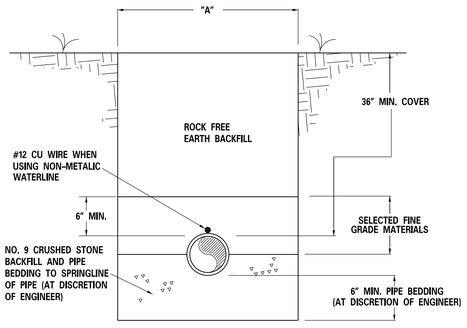


LINER PIPE DETAIL

LINER PIPE WALL THICKNESS TABLE	
PIPE SIZE	WALL THICKNESS
14" & UNDER	0.250
16"	0.281"
18"	0.312"
20" & 22"	0.344"
24"	0.375"
26"	0.406"
28"	0.438"
30"	0.469"
32"	0.500"



PAVED AREAS



OPEN AREAS

MAXIMUM TRENCH WIDTH			
PIPE SIZE	"A"	"B"	"C"
4" THRU 12"	30"	16"	40"
14" THRU 18"	36"	24"	48"
20" THRU 24"	42"	42"	66"
26" THRU 36"	54"	54"	78"

TYPICAL BACKFILL/BEDDING AND PAVEMENT REPLACEMENT METHODS

Hank A. Spaulding

U3

RECORD DATE 9 / 24 / 14 (REVISED 12 / 08 / 14)	KY 1096 BRIDGE REPLACEMENT WATER UTILITY RELOCATION CITY OF HAZARD, KENTUCKY
PROJECT NO. IBRD 1003 203 ITEM NO. 10-1095.00	COMMONWEALTH OF KENTUCKY KENTUCKY DEPARTMENT OF HIGHWAYS FRANKFORT, KENTUCKY
DRAWN BY. EH	
CHECKED BY: HAS	H. A. SPALDING ENGINEERS 651 SKYLINE DRIVE HAZARD, KENTUCKY 41701 – 1664
SCALE:	

FILE NAME: X:\ENGR\KY 10 1095 UTIL RELOU3.DGN
USER: Earl Hurt
DATE PLOTTED: September 25,2014
E-SHEET NAME:
MicroStation v8.11.7.443

141071

PROPOSAL BID ITEMS

Report Date 12/9/14

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	311.00	TON		$	
0020	00020		TRAFFIC BOUND BASE	27.00	TON		$	
0030	00100		ASPHALT SEAL AGGREGATE	5.40	TON		$	
0040	00103		ASPHALT SEAL COAT	.70	TON		$	
0050	00212		CL2 ASPH BASE 1.00D PG64-22	411.00	TON		$	
0060	00301		CL2 ASPH SURF 0.38D PG64-22	96.00	TON		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0070	00078		CRUSHED AGGREGATE SIZE NO 2	27.00	TON		$	
0080	01000		PERFORATED PIPE-4 IN	100.00	LF		$	
0090	01010		NON-PERFORATED PIPE-4 IN	50.00	LF		$	
0100	01020		PERF PIPE HEADWALL TY 1-4 IN	2.00	EACH		$	
0110	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	10.00	EACH		$	
0120	02014		BARRICADE-TYPE III	2.00	EACH		$	
0130	02159		TEMP DITCH	98.00	LF		$	
0140	02200		ROADWAY EXCAVATION	407.60	CUYD		$	
0150	02242		WATER	33.00	MGAL		$	
0160	02351		GUARDRAIL-STEEL W BEAM-S FACE	112.50	LF		$	
0170	02355		GUARDRAIL-STEEL W BEAM-S FACE A	100.00	LF		$	
0180	02360		GUARDRAIL TERMINAL SECTION NO 1	8.00	EACH		$	
0190	02371		GUARDRAIL END TREATMENT TYPE 7	1.00	EACH		$	
0200	02391		GUARDRAIL END TREATMENT TYPE 4A	1.00	EACH		$	
0210	02397		TEMP GUARDRAIL	350.00	LF		$	
0220	02429		RIGHT-OF-WAY MONUMENT TYPE 1	11.00	EACH		$	
0230	02432		WITNESS POST	3.00	EACH		$	
0240	02545		CLEARING AND GRUBBING 0.4 ACRES	1.00	LS		$	
0250	02562		TEMPORARY SIGNS	206.00	SQFT		$	
0260	02585		EDGE KEY	39.00	LF		$	
0270	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0280	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		$	
0290	02701		TEMP SILT FENCE	350.00	LF		$	
0300	02703		SILT TRAP TYPE A	3.00	EACH		$	
0310	02704		SILT TRAP TYPE B	3.00	EACH		$	
0320	02705		SILT TRAP TYPE C	3.00	EACH		$	
0330	02706		CLEAN SILT TRAP TYPE A	9.00	EACH		$	
0340	02707		CLEAN SILT TRAP TYPE B	9.00	EACH		$	
0350	02708		CLEAN SILT TRAP TYPE C	9.00	EACH		$	
0360	02709		CLEAN TEMP SILT FENCE	350.00	LF		$	
0370	02726		STAKING	1.00	LS		$	
0380	02731		REMOVE STRUCTURE	1.00	LS		$	
0390	05950		EROSION CONTROL BLANKET	182.00	SQYD		$	
0400	05952		TEMP MULCH	1,890.00	SQYD		$	
0410	05953		TEMP SEEDING AND PROTECTION	1,890.00	SQYD		$	

141071

PROPOSAL BID ITEMS

Report Date 12/9/14

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0420	05963		INITIAL FERTILIZER	.10	TON		$	
0430	05964		20-10-10 FERTILIZER	.20	TON		$	
0440	05985		SEEDING AND PROTECTION	1,890.00	SQYD		$	
0450	05992		AGRICULTURAL LIMESTONE	1.20	TON		$	
0460	06510		PAVE STRIPING-TEMP PAINT-4 IN	1,400.00	LF		$	
0470	06514		PAVE STRIPING-PERM PAINT-4 IN	1,400.00	LF		$	
0480	21289ED		LONGITUDINAL EDGE KEY	250.00	LF		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0490	00441		ENTRANCE PIPE-18 IN	65.00	LF		$	
0500	00464		CULVERT PIPE-24 IN	36.00	LF		$	
0510	00466		CULVERT PIPE-30 IN	10.00	LF		$	
0520	00468		CULVERT PIPE-36 IN	16.00	LF		$	
0530	01001		PERFORATED PIPE-6 IN	67.00	LF		$	
0540	01208		PIPE CULVERT HEADWALL-24 IN	1.00	EACH		$	
0550	01212		PIPE CULVERT HEADWALL-36 IN	1.00	EACH		$	
0560	01371		METAL END SECTION TY 1-18 IN	1.00	EACH		$	
0570	01517		DROP BOX INLET TYPE 5F	1.00	EACH		$	
0580	01544		DROP BOX INLET TYPE 11	1.00	EACH		$	
0590	01767		MANHOLE TYPE C	1.00	EACH		$	
0600	02483		CHANNEL LINING CLASS II	9.00	TON		$	
0610	02484		CHANNEL LINING CLASS III	77.00	TON		$	
0620	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	44.00	SQYD	$2.00	$	$88.00

Section: 0004 - BRIDGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0630	02231		STRUCTURE GRANULAR BACKFILL	164.00	CUYD		$	
0640	02355		GUARDRAIL-STEEL W BEAM-S FACE A	100.00	LF		$	
0650	02998		MASONRY COATING	80.00	SQYD		$	
0660	03299		ARMORED EDGE FOR CONCRETE	63.60	LF		$	
0670	08001		STRUCTURE EXCAVATION-COMMON	40.00	CUYD		$	
0680	08002		STRUCTURE EXCAV-SOLID ROCK	14.00	CUYD		$	
0690	08019		CYCLOPEAN STONE RIP RAP	416.00	TON		$	
0700	08033		TEST PILES	35.00	LF		$	
0710	08039		PRE-DRILLING FOR PILES	123.00	LF		$	
0720	08046		PILES-STEEL HP12X53	143.00	LF		$	
0730	08104		CONCRETE-CLASS AA	19.70	CUYD		$	
0740	08151		STEEL REINFORCEMENT-EPOXY COATED	2,354.00	LB		$	
0750	08662		PRECAST PC BOX BEAM CB17-48	288.00	LF		$	
0760	08801		GUARDRAIL-STEEL W BEAM-S FACE BR	81.00	LF		$	
0770	24414EC		PRECAST END BENT	2.00	EACH		$	

Section: 0005 - UTILITY

141071

PROPOSAL BID ITEMS

Report Date 12/9/14

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0780	01067		STEEL ENCASEMENT PIPE-10 IN (REVISED: 12-9-14)	25.00	LF		$	
0790	01315		BLOW-OFF ASSEMBLY TYPE 1 (REVISED: 12-9-14)	1.00	EACH		$	
0800	03382		PVC PIPE-3 IN	10.00	LF		$	
0810	03385		PVC PIPE-6 IN (REVISED: 12-9-14)	180.00	LF		$	
0820	03523		GATE VALVE-3 IN	1.00	EACH		$	
0830	03526		GATE VALVE-6 IN	2.00	EACH		$	
0840	03550		CUT & CAP EXIST WATER MAIN	2.00	EACH		$	
0850	04800		MARKER	4.00	EACH		$	
0860	20311EC		SERVICE LINE-3/4 IN TUBING (REVISED: 12-9-14)	175.00	LF		$	
0861	20311EC		SERVICE LINE-3/4 IN TEMPORARY TUBING (REVISED: 12-9-14)	140.00	LF		$	
0870	21269ND		REMOVE-RELOCATE AND RECONNECT SERVICE	7.00	EACH		$	
0880	22668EN		DIRECTIONAL BORE (REVISED: 12-9-14)	220.00	LF		$	
0890	22866NN		WATER METER TANDEM SET (REVISED:12-9-14)	2.00	EACH		$	
0891	22866NN		WATER METER TEMPORARY TANDEM SET (REVISED: 12-9-14)	1.00	EACH		$	
0900	23300ED		CRUSHED STONE	60.00	TON		$	
0910	23340EC		PAVEMENT REPLACEMENT	5.00	TON		$	
0920	23341EC		GENERAL CONCRETE	10.00	CUYD		$	
0930	23596EC		TAPPING SLEEVE AND VALVE-6 IN	2.00	EACH		$	
0940	24078EC		WATER MASTER METER AND PIT	1.00	EACH		$	

Section: 0006 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0950	02569		DEMOBILIZATION	1.00	LS		$	

FOURSEAM – AVAWAM, KY 1096 (OVER BIG CREEK)
WATER UTILITY RELOCATION
INDEX FOR TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

SPECIAL NOTES

A. Unless noted, all waterline fittings are Mechanical Joint. All mechanical joint fittings shall use Grip Rings on every branch, inlet or outlet.

B. Crushed stone for backfilling and bedding of pipe is a Pay Item if it relates to the utility relocation specifically (versus as part of the Roadway Project). This reduction in cost should be reflected in your Unit Price for waterline piping.

C. All concrete in the job, with the exception of items shown within 'Pay Limits' (for example at a Booster Station), is a Pay Item, including concrete kickers, all patches, and creek crossing concrete, and is payable at your Unit Price for that bid item.

D. Special attention should be afforded all areas that are marked with 'Pay Limits'. Notes as they appear on the drawings will be strictly adhered to concerning pay items and unit price items which are not included in any lump sum bid. Note that some external valves are excluded from this requirement if they lay within Pay Limits and these valves may be paid for at their unit price as submitted if Pay Limits lines point towards this fact.

E. Contractors should note the placement of No. 12 copper wire in the location of all plastic water pipe. Substitutes such as line marking tape will not be accepted. Smaller diameter wire will not be accepted. **This requirement will be waived in locations of HDD pipe.**

F. The sequence of construction (if any) as noted in other areas of these specification shall be strictly adhered to.

G. The Contractor should notice that there is not a Reinforced Concrete Pay Item. The Engineer may at his discretion require reinforcement in any general concrete area. This is for all replacement of driveways, highways, and other concrete structures where reinforcement is required (at the discretion of the Engineer). This reinforcement may vary from a minimum of 6x6, 10/10 W.W.M. up to a maximum of #5's @ 12" ea. way. This reinforcement may also be required on concrete thrust blocks (kickers). There will be no adjustment in your Unit Price for General Concrete for this work.

H. Use extreme caution in areas where other utilities are shown. All utility locations as shown on the drawings should be considered approximate. All known utility crossings (after this determination by the utility) shall be flagged by the appropriate agency. These crossings may require hand digging for discovery and/or clearance. The Contractor is required to coordinate all of his activities with any other utility.

I. Contractor shall contact all utilities and arrange for flagging of all existing lines.

J. Valve collars shall be required at all valves and cost shall be included in the unit price for

the valve and box. Valve Markers shall be placed at all valves or valve grouping. The cost of these valve markers and collars shall be included in the Unit Cost of Valves. Additionally, all Creek Crossings and road bore and road crossings shall be marked as shown on the Drawings. The cost of these markers shall be considered as incidental to other areas of the work.

K. All "TIES" are bid items including all necessary materials required to make the same. The Drawings designate location and may give some guidance to what each tie includes.

L. The plans serve as a guide to the final line location. The line location as shown on the Drawings represents the Engineer's interpretation of proper line location. However, the Contractor, because of his extensive knowledge obtained from line installation, shall immediately contact the Engineer should construction appear unreasonable, dangerous, or liable to generate property damage in any location. This notification shall include all likely areas of slip, slide, or other ground movement. The Contractor is responsible for all construction activities and any detrimental result of his construction. The Contractor, in accepting any portion of this Contract, assumes all associated responsibility for any and all construction activity. As such, the Contractor has the right, **and obligation**, to request changes in line location which benefit the project, the adjoining land owners, area residents, or any other person or place which appears to have less negative impact by a revised line location.

M. The Contractor should note and pay careful attention to the location of all lines as they are constructed around/over/under existing/proposed cross drains. The line locations as shown may have been mandated by the Kentucky Transportation Cabinet and will be strictly adhered to. The Contractor shall consider all work as shown on the Plans in his Bid, with the understanding that modification or relocation of these lines in cross drain areas will not occur without written permission from the Kentucky Transportation Cabinet.

N. **A digital camera shall be used to photograph all new valves, or valve groupings** (if valves lay within 5' radius of each other). Each valve or valve grouping photograph shall be named with a descriptive title. For example, if a valve grouping is at the intersection of Beehive Branch Road and KY 699, it shall be named "Beehive_KY699.JPG". Each photograph shall be descriptive in and of itself with background information sufficient for subsequent location of the valve grouping by Water Department personnel. Two (2) compact disks (CD's) shall be provided to the Water Utility Relocation Engineer after project completion showing all valve or valve groupings. Final payment will not be made until these CD's are submitted. The Contractor shall work with the Resident Engineer to ensure that correct titles are transferred to "AS-BUILT" drawings.

O. Sequence of construction is important to this project. See the following page of these Specifications.

P. The Highway Department may require that a minimum depth of cover, exceeding the 36"

shown on the Plans for all permanent lines, be used in certain, or all, areas which are along State Highway right-of-way. The Contractor should note that the 24" cover for the temporary line is only used because the line will ultimately be abandoned.

Q. The Contractor shall be required to send the Utility Relocation Engineer a "Red Lined" set of drawings for the Engineer's use in preparation of "As-Built" drawings.

R. **The Water Utility Relocation Engineer shall witness the pressure tests on the Permanent lines**. The Contractor shall contact the Engineer as far in advance of these tests as practical, but in no case not less than 2 days in advance of the test, so the Engineer may schedule personnel to attend.

S. **The Water Utility Relocation Engineer shall be provided satisfactory disinfection test results before bringing either line into service.** These tests shall be run by a State Accredited Laboratory.

T. The Water Relocation Engineer shall be provided shop drawings on the following items:

PVC Waterline
D.I. Waterline (including specs. for gasket material)
Service Tubing
Valves
Liner Pipe (Encasement Pipe)
Grip Rings
All Fittings
Blow-Off
Service Fittings
Meter Box
Meter Box Lids
Mag Meter

The Water Relocation Engineer is:

Hank A. Spaulding
H.A. Spalding Engineers, Inc.
651 Skyline Drive
Hazard, KY 41701
(606) 436-2151
hank.spaulding@haspaldingengineers.com

SEQUENCE OF WORK

Waterline Contractor Sequence: Sequence of Work is important to this project. As shown, the Contractor shall complete the wet taps first, obtaining the ability to isolate the remaining new work. After new line has been put into service (after passing pressure and disinfection tests) the caps shall be installed. Temporary construction is planned to allow the construction of the highway run around without having the customer out of water for extended periods. After the new 6" line is in service the Contractor may complete the abandonment work required in any desired sequence which results in the minimum downtime for any water customer. All work shall be completed in a workmanlike manner and in a manner which minimizes water customer downtime.

INSTALLATION:

Trenching - The CONTRACTOR should note the trencher requirements under Special Notes within these specifications. Trenching shall be done in a true straight line at all times and fittings shall be used only at the direction of the RESIDENT ENGINEER.

Trenching shall include all clearing and grubbing, including all weeds, briars, trees, and stumps encountered in the trenching. The CONTRACTOR shall dispose of any such material by burning, burial, or hauling away, at no extra cost to the OWNER. Shrubs, hedges, and small trees (3" in dia.) shall be removed and replanted, at no extra cost to the OWNER. Trenching also includes such items as street, road, sidewalk, pipe and small creek crossings; cutting, moving, or repairing damage to fences, poles, or gates and other surface structures, regardless of whether shown on the Plans.

All material encountered in excavation shall be Unclassified. In areas where rock is encountered, a min. of 6" of crushed stone shall be placed in the bottom of the trench before installation of the pipe. Extra payment will be made for the installation of the crushed stone at your submitted unit price for crushed stone. The price for the pipe in place shall also include hauling off of all excavated material.

The CONTRACTOR shall determine, as far as possible in advance, the location of all existing sewer, culvert, drain, water, electric, and gas pipes and other subsurface structures and avoid disturbing same in opening his trenches. In case of sewer, water, and gas services, and other facilities easily damaged by machine trenching, same shall be uncovered without damage ahead of trenching, and restored immediately after trenching machine has passed, without extra cost to the OWNER. The CONTRACTOR shall protect such existing facilities, including power and telephone poles and guy wires, against danger or damage due to settlement of his backfill. It shall be the responsibility of the CONTRACTOR to inform customers of utilities of disruption of service as soon as it is known that it has or will be cut off.

The CONTRACTOR shall at all times during trenching operations on the streets, carry a stock of pipe and fittings likely to be needed for replacement of pipe to facilitate immediate repair.

Construction equipment will not be approved for use where treads are injurious to paving encountered. Curbs, sidewalks, and other structures shall be protected by the CONTRACTOR from damage by his construction equipment.

In case of damage to any existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all cases, restoration and repair shall be such that the damaged structure will be in as good condition and serve its purpose as completely as before and such restoration and repair shall be done without extra charge, except as set forth under the provisions of the General Conditions. Where there is the possibility of damage to existing utility lines by trenching machine, the ENGINEER may order hand search excavation ahead of machine trenching to uncover same, at no extra cost to the OWNER.

All trenches must be dug neatly to lines. Hand trenching may be required by the ENGINEER, at no extra payment, where undue damage would be caused by existing structures and facilities by machine trenching. Trenches in earth shall be dug to just above grade by machine and shall be finished down to grade by hand, unless otherwise specified.

Where trenching is cut through paving, which does not crumble on edges, trench edge shall be cut to at least two (2") inches deep to straight and neat edges before excavation is started, and care taken to preserve edge to facilitate neat repaving as shown on the Drawings.

All excavation shall be open trenches, except where otherwise called for on the Plans or by special permission of the ENGINEER, for boring or jacking under railroads, sidewalks, and the highway.
When working along the highway the CONTRACTOR shall furnish, install and maintain necessary signs, lights or other warning devices as prescribed by the Kentucky Department of Transportation and shall furnish and employ sufficient flagmen to direct traffic in the construction area all as directed by the Department of Transportation. All signs, devices, flagmen, etc. shall be as prescribed in the "Manual on Uniform Traffic Control Devices, Part VI," latest revision.

The CONTRACTOR shall so coordinate his work as to produce a minimum of interference with normal traffic on highways and streets. He may, with the approval of the ENGINEER and governing agency, close a street to traffic for such length of time considered necessary by the ENGINEER, provided persons occupying property abutting the streets have an alternate route of access to the property which is suitable for their needs during the time closure. It shall be the responsibility of the CONTRACTOR to give 24 hours advance notice to Fire and Police Departments and to occupants of a street which will be closed in a manner approved by the ENGINEER.

The opening of more than 500 feet of trench ahead of the pipe laying and more than 500 feet of open ditch left behind pipe laying before backfilling, will not be permitted except upon written consent of the OWNER. No trench shall be left open or work stopped on same for a considerable length of time. If such is necessary, trench shall be refilled according to backfill specifications. In crossing a road or street a temporary bridge must be placed over the excavation if traffic conditions require its use before backfilling. Where required or when directed by the ENGINEER, road or street crossings will be limited to one-half of travel width before placing temporary bridge over the excavated side. Whenever trenching is performed on public ways, the CONTRACTOR shall furnish and maintain barricades, lanterns, warning sign and signals as far as one block ahead or at locations directed by the governing agency as required for public safety. All such necessary bridges, barricades, lanterns, signs and signals shall be provided by and at the expense of the CONTRACTOR. The CONTRACTOR shall maintain road crossings in a passable condition for traffic until the final acceptance of the work at no cost to the OWNER.

If required by weather conditions, the CONTRACTOR shall furnish a water truck with equipment suitable to eliminate dust problems. Additionally, the CONTRACTOR shall have suitable equipment to clean all roads of excavated material before the end of the work day.

Where pipelines run through wooded terrain, cutting of trees within limits of maximum permissible trench width, as set forth in this article, will be permitted. However, cutting of additional trees on sides of trench to accommodate operation of trenching machine will not be permitted. The CONTRACTOR shall obtain specific permission of the OWNER before cutting any tree larger than four (4") inches in diameter.

Sheeting and shoring of trench will be required of this CONTRACTOR where necessary to protect life, property, or the waterline structure from damage or to maintain maximum permissible trench widths at top of pipe. Sheeting, sheet piling, trench jacks, braces, shores, and stringers shall be used to hold trench walls. These shall be withdrawn as the trenches are being backfilled, after backfill has been placed over pipe at least 18". If their removal, before backfill is completed to surface, endangers adjacent structures such as pipelines, street paving, sidewalk and buildings, then they shall be left in place until such danger has passed and then pulled if possible. Voids caused by sheeting withdrawal shall be backfilled and tamped with thin rammers designed for the purpose so as not to form an obstruction at the ground level. Dewatering of the trenches shall be considered a part of trenching at no extra cost to the OWNER. Dewatering of trenches shall include ground water and storm or sanitary sewage. Suitable pumping and other dewatering equipment is to be provided by the CONTRACTOR to insure the installation of the pipeline structure in a dewatered trench and under the proper conditions. Dewatering shall include all practical means available for prevention of surface runoff into trenches and scouring against newly laid pipe.

Piles of excavated material shall be trenched or temporarily piped to prevent, as far as practical, blockage of drainage ditches and gutters and resultant water carriage of excavated materials over street surfaces.

Where subgrade of trench has insufficient stability to support the pipeline and hold it to its original grade, the ENGINEER may order stabilization by various means. Exclusive of dewatering normally required for construction and instability caused by neglect of the CONTRACTOR, it shall be paid for at unit prices set up in the Contract such as extra excavation, crushed rock for pipe bedding, concrete cradle, or piling.

The location of pipe and their appurtenances, as shown, are those intended for the final construction. However, conditions may present themselves before construction of any line is started, that would indicate desirable changes in location. Also, development of property traversed may require location changes. In such cases, the OWNER reserves that right to make reasonable changes in line and structure location without extra cost except as may be determined by the application of the unit prices bid to the quantities actually involved. The OWNER is under no obligation to locate pipelines, so they may be excavated by machine.

The work of uncovering and backfilling required for locating existing sewers, waterlines and other existing facilities for connection of improvements, or avoidance in location of proposed pipeline, where such uncovering and backfilling is not within trench for improvements, shall be at the CONTRACTOR's expense.

The CONTRACTOR will be required to test all pipelines and appurtenances with water at 150 lbs. per square inch Minimum (or a min. of 1.5 times the service pressure) before backfilling. Backfilling before testing will be allowed at the discretion of the ENGINEER at points where danger to the public, or other hazards, demand that such be done immediately after pipe is laid. All leakage apparent after testing must be repaired before backfilling.

Backfilling Trenches:

Backfilling must be started as soon as practicable after pipe has been laid. Packing of earth across and around pipe at six (6') foot intervals and between joints shall be the usual procedure as the laying proceeds. This is in order to avoid danger of mis-alignment from slide, flooding or other causes. The ENGINEER shall be given a maximum of 24 hours for inspection before backfilling. Only earth, or rock less than 2-1/2" size, shall be used as backfill materials up to six (6") inches above top of pipe. No stones or other hard or heavy substances may be thrown directly upon the pipes or into the trench until the above named cover of earth is obtained. Above the 6 or 12 inches above pipe, rock may be used in the backfill to an extent not greater than one-half of the total backfill materials used. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously in order that all voids in the rock may be filled with earth. Where noted on the Plans and within the shoulder of the Kentucky Highways, the CONTRACTOR shall backfill to finish highway grade with DGA. The DGA shall be tamped in six (6") inch layers in accordance with Department of Transportation Specifications. In these areas (if any) DGA will be a pay item. All material hauled away shall be placed at no cost and at a location specified by the ENGINEERS.

No extra charge shall be made for supplying outside materials for backfill or removing excess excavation material from the site of the work.

Extra cost of compaction of backfill on street and driveway crossings and tunnels shall be included in price bid for Blacktop Replacement.

Where highway slopes, thin grass, or cover crops are destroyed by trenching, laying, or backfilling operations, and access to them, surface shall be prepared by disking, fertilizing 5 lbs. of 5-10-5 or 6-8-6 per 1,000 square feet and seeding 21 lbs. of Italian Rye Grass per 1,000 square feet, light harrowing, then reseeding with crop destroyed or one part Red Top, three parts certified Kentucky Bluegrass seed mixed together at the rate of 2 lbs. per 1,000 square feet of surface. This shall be included in the price for trenching and backfilling. Requirement of the Department of Transportation, Bureau of Highways, for reseeding shall take precedence over these specifications.

Cleaning Up and Repairing Damage:

The Contract will not be considered complete until all construction structures and equipment and rubbish from construction are cleaned from the site of the work.

All damage to existing grounds and structures caused by construction operations must be repaired or the OWNER compensated for such damage before contract will be considered complete. This does not include replacement of sod, but does include required shaping of ground for sodding or planting of grass and the removal and disposition of all rock from blasting three (3") inches or over in size.

Hauling and Storage:

The CONTRACTOR will be required to deliver all pipe, fittings, valves and valve boxes and other materials and place same as and where required for laying.

Care must be exercised in the handling of all materials and equipment and the CONTRACTOR will be held responsible for all breakage or damage to same caused by his workmen, agents of appliances for handling or moving. Pipes and other castings shall in no case be thrown or dropped from cars, trucks, or wagons to the ground but same shall be lowered gently and not allowed to roll against or strike other castings and unyielding objects violently. Pipe and special castings may be distributed at places that will not interfere with other building operations as unloaded or yard and distributed as required, as the CONTRACTOR may elect.

Valves, valve boxes, jointing materials, meter box covers, castings, fabricated metal, reinforced steel, etc. shall be yarded or housed in some convenient location by the CONTRACTOR and delivered on the ground, as required.

The cost of all hauling, handling, and storage shall be included in the price bid for equipment and materials in place.

The OWNER takes no risk or responsibility for fire, theft, flood, or damage until after the final acceptance of the work.

TESTING OF LINES:

On all projects involving the installation of water pipeline, the finished work shall comply with the provisions listed below, or similar requirements which will insure equal or better results.

..a. All water mains shall be given a hydrostatic test to 150 psi (or 1.5 times the service pressure), under which leakage shall not exceed the limits established in Section 4 of AWWA Standard Specifications C600.

..b. Where practicable, pipelines shall be tested between line valves or plugs in lengths of not more than 3,000 feet.

..c. Duration of test shall be not less than two hours.

..d. Where leaks are evident on the surface where joints are covered, the joints shall be re-caulked, re-poured, bolts retightened or re-laid, and leakage minimized regardless of total leakage as shown by test.

..e. All appurtenances shall be connected and made ready for ultimate service before the pressure test. Specifically, all meter boxes, yokes, and appurtenances (with sole exception of meter unit) shall be installed prior to the pressure test. Additionally, all meter yokes shall be "flowed" to insure that the corp stop has been connected and is in the open position. This flow shall be witnessed by the ENGINEER'S Representative. All pipe, fittings and other materials found to be defective under test shall be removed and replaced.

..f. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with.

..g. The CONTRACTOR shall furnish a recording gauge and clock used during leakage test and recording pressure charts during duration of test. Recording pressure charts shall remain the property of the ENGINEER at conclusion of test.
The new potable waterlines shall not be placed in service, either temporarily or permanently, until they have been thoroughly disinfected in accordance with the following requirements and to the satisfaction of the ENGINEER.

..h. The CONTRACTOR, in consultation with the Resident Engineer, shall keep, maintain, and update, a color coded project map which shows what lines have been pressure tested, date of test, and result. See below for additional requirements.

After successful pressure testing, a solution of hypochlorite using HTH, or equal, shall be introduced into the section of the line being disinfected sufficient to insure a chlorine dosage of at least 50 ppm in the main. While the solution is being applied the water should be allowed to escape at the ends of the line until tests indicate that a dosage of at least 50 ppm has been obtained throughout the pipe. Open and close all valves and cocks while chlorinating agent is in the piping system. The Chlorinated water shall be allowed to remain in the pipe for 24 hours, after which a residual of at least 25 ppm shall be obtained. The disinfection shall be repeated until 25 ppm is obtained, after which time the main shall be thoroughly flushed until the residual chlorine content is not greater than 1.0 ppm.

Following disinfection of the line, bacteriological samples shall be collected and analyzed in accordance with the requirements of Kentucky Department of Natural Resources and Environmental Protection. When the samples have been approved, the new line then may be connected to the system. On the map noted above, the Contractor, in consultant with the Resident Engineer, shall keep, maintain, and update the color coded map showing dates samples were collected, and dates where samples were approved.

ONE YEAR GUARANTEE:

The CONTRACTOR, and through him each subcontractor, in accepting the contract for this construction, or respective portions of the construction covered by these Plans and Specifications, does hereby agree to replace and make good, without expense to the OWNER, any work or material which may be found to be defective within one (1) year from the date of the final certificate of payment of said CONTRACTOR. The deterioration due to ordinary use and wear and failure of materials furnished by the OWNER are excepted from this guarantee.

This guarantee shall include damage done by settlement of backfills and filling regrade elevations, such damage and sinking of fills being considered as defective workmanship. This shall also include pavement failure.

The CONTRACTOR shall reimburse the OWNER for cost of damage, if any, as well as cost of replacing defective materials or workmanship. If replacements are not made within ten (10) days in case of materials, then the OWNER shall have the right to make replacements and charge cost of same to the CONTRACTOR or his Bondsman.

MATERIAL:

PVC PIPE - CLASS 250:

All Waterline designated as PVC shall be PVC type pressure pipe designed ASTM Class 250 of the Integral Bell Joint type. The pipe shall conform to ASTM 2241 for Standard Dimension Rations, SDR 17 for pressure characteristics. The pipe shall be extruded from clean, virgin, approved class 12454-A PVC compound conforming to ASTM resin Specification D1784. Rubber rings shall conform to ASTM D 1869. This pipe shall be CertainTeed Fluid-Tite PVC Pressure pipe or approved equal. Laying radius of pipe shall in all cases be equal to, or greater than, that listed by the manufacturer of the pipe. All tees, elbows, and bends shall be Mechanical Joint unless noted on the Plans. All mechanical joint fittings shall be equipped with grip rings.

DUCTILE IRON PIPE:

All pipe designated as ductile iron shall be of Grade 60-42-10 material meeting AWWA C151 Minimum physical properties. Thickness of the pipe shall be determined in accordance with ANSI/AWWA C150/A21.50 and shall be Type 4 Bedding Condition except in high traffic areas where Type 5 Bedding shall be used; all pipe shall be thickness Class 50 with the exception of 4" and 3" which shall be thickness Class 51. Joints shall meet the requirements of AWWA C111 for Fastite Joint Pipe ANSI/AWWA C151.51 and Mechanical Joint ANSI/AWWA C111/A21.11. Pipe shall be equal to that manufactured by the U. S. Pipe Company or approved equal. All tees, elbows, and bends shall be Mechanical Joint. All mechanical joint fittings shall be equipped with grip rings. The exterior of the pipe shall be furnished with an asphaltic coating. Installation shall be as recommended by the manufacturer in their printed manual. Pulling devices and tie-in devices shall be that normally furnished by the manufacturer for this type of installation. **Ductile iron pipe is being used to cross areas which are assumed to be contaminated with gasoline or gasoline type substances** (these areas clearly shown on the plan), the Contractor shall use gasket material recommended by the pipe manufacturer as being impervious or highly resistive to degradation from gasoline type chemicals. **Nitrile Rubber Gaskets are satisfactory**. Pipe which is noted as D.I.M.J. shall be ductile iron, mechanical joints. Where the Plans designate 3" ductile iron pipe, except where 3" ductile iron pipe is designated within the Pay Limits of Blow-Offs, may substitute, at his convenience, 4" ductile iron pipe. The Unit Price shall be the same regardless. Should the Contractor elect to use 4" D.I. vs 3" D.I., any associated valve or fitting shall be paid at the 3" Unit Price (if it exists).

POLYETHYLENE (PE) PIPE (WATER):

Polyethylene Pipe shall be manufactured in accordance with AWWA CD01 for sizes 1/2" through 3" and in accordance with AWWA C906 for sizes 4" through 54". All Copper Tubing Size (C.T.S.) PE pipe shall be high density polyethylene (PE 3408) intended for the transportation of potable water, or if available at the time of construction shall be high density polyethylene PE 4710. All PE pipe smaller than two inch shall have a minimum pressure rating of 200 psi and have a dimension ratio (DR) of 9. All PE pipe larger than 2” shall be Iron Pipe Size (I.P.S.) and shall be high density polyethylene PE 4710, have a minimum pressure rating of

252 psi, and shall have a dimension ratio of 9. All PE pipe fittings shall be butt fusion welded per the manufacturer's requirements. All joints between plain ends of polyethylene pipe shall be made by butt fusion. The Contractor shall follow all requirements in the pipe manufacturer's printed literature for butt fusion welds including test weld requirements. All transitions from PE pipe to other pipe types shall use the appropriate adapter as detailed on the plans. All PE pipe shall be Plexco or approved equal.

HORIZONTAL DIRECTIONAL DRILLING (HDD):

All areas designated on the Plans as Horizontal Directional Drilling (HDD) shall be completed using equipment designed for the size and type of pipe noted. All HDD shall be completed using PE 4710 high density polyethylene, DR 9, having a minimum pressure rating of 252 psi, unless noted otherwise on the plans. **The Unit Price of HDD includes the cost of the pipe itself,** and all else required for a complete and finished installation.

The Contractor shall have experience in this type of work (HDD) suitable to the Engineer.

VALVES:

All valves must be of cast iron with bronze mountings, unless otherwise specified. Only makers of well-known and approved standings who have been making similar devices for a period of at least ten (10) years, prior to the bid date, will be considered. Also, maker shall be prepared to furnish through the bidder, within one (1) week after award is made, complete catalogues or other descriptive matter giving complete details and dimensions of valves they proposed to furnish.

All valves shall be provided with suitable operating devices and adapted for operation in the position in which they are shown on the plans. All screw operated valves shall open by turning to the left.
All valves shall have mechanical joints both ends (unless noted on the Plans) and shall conform to A.W.W.A Specifications D-150, N.R.S. complying to A.W.W.A. C222 and ANSI A21.11.

All 4" through 10" Gate valves shall be resilient seat Gate valves, 200 psi max working pressure, 400 psi test pressure, Mueller A-2370-20, or approved equal. 3" and smaller Gate valves shall be double disc, parallel seat, bronze faces and disc rings with wedging mechanism simple and direct, Mueller A-2380-20, or approved equal. 1", 1-1/4", and 1-1/2" Gate valves shall be Mueller H-10914, bronze Gate valve with solid wedge and F.I.P. thread with appropriate fittings and hand wheel. All valves shall conform to the latest revision of "Specifications for Gate Valves for Ordinary Water Works Service," adopted by A.W.W.A. Test pressure 300 lbs. (min.) per square inch and working pressure 150 lbs. (min. allowable working pressure) per square inch. 1-1/2" Gate valves shall be installed as detailed on the Drawings.

VALVE BOXES:

Valve Boxes for 1" through eight (8") inch valves shall be telescope type with screw top, of extension length suitable for the cover/s noted on the plans. Ten (10") inch and twelve (12") inch valve boxes shall have an extension length ranging from eighteen (18") inches to twenty-four (24") inches. These minimum valve box lengths redefine depth of cover over pipe at valve locations. These requirements shall be maintained. Pieces of scrap PVC or ductile iron pipe with lid installed **shall not** be acceptable. Valve boxes shall be Tyler 461-S for ten (10") inch and twelve (12") inch valves, Tyler 562-S for one (1") inch through eight (8") inch valves, or approved equal. All valve boxes shall have a minimum inside diameter of 4-1/4" for intersection with an arc base. **In high traffic areas only** all valve box lids shall be cast iron and manufactured by the same firm as the box and marked WATER. **In all other areas**, use plastic lid manufactured by Bingham & Taylor, NCUL5LWRDLT with locking tab, H20 load rated, or approved equal, and marked WATER. All valve boxes shall have installed a valve box collar similar in all respects to the Cloud Company U-235 Valve Retainer Ring, alternate as shown on the detail sheet, or approved equal.

TYPE I, 3" BLOW-OFF:

Type I, 3" Blow-off's shall be self-draining, non-freeze, compression type with 2-1/4" main valve opening. Inlet connection shall be 3" Mechanical Joint. Outlet size shall be 2-1/2" NST. Blow-offs shall have cast iron box, locking lid, and 3" Ductile Iron Riser Pipe. Principal operating parts shall be Brass and be removable from the blow-off for servicing without excavation. Blow-offs shall be set in four cubic feet min. of crushed stone to allow for proper drainage. The blow-off shall be M&H Style 333 Flush Type, or approved equal.

SERVICE LINE:

All service tubing used on the project shall be from makers with a min. of 10 years experience in this business. Pre approved manufactures include PLEXCO, Phillips, and Orangeburg. Any other manufacturer requires Engineer approval. All service tubing shall be copper tubing size (CTS) outside diameter, pressure Class 200, and shall be in conformance with AWWA C 901.

LINER PIPE:

Liner Pipe of the size and location, as shown on the Plans, shall be installed. The pipe shall be a high quality Wrought Steel Schedule and weights as listed below, with the same properties as determined by the American National Standard for welded and seamless wrought steel pipe. Used pipe will not be accepted unless it is delivered to the job site in as-new condition as determined by the Engineer.

Liner Pipe Table

Pipe Size	Sch. #	Wall (In.)	#/Foot
6"	40 (Std.)	.250	19.0
8"	40 (Std.)	.250	28.6
10"	40 (Std.)	.250	40.5
12"	(Std.)	.250	49.6
14"	30 (Std.)	.250	54.6
16"	30 (Std.)	.383	62.6
18"	(Std.)	.383	70.6
20"	20 (Std.)	.383	78.6

The Liner Pipe shall be either bored with appropriate equipment or Open Cut as designated on the Plans.

CAPS or PLUGS, 3" THROUGH 10"

Where designated on Plans, Mechanical Joint Caps or Plugs size 3" through 10" shall be installed. These caps shall be equipped with grip rings. No unit price difference will be made between any size or Cap vs. Plug. All caps or plugs shall receive concrete kickers as shown on the plans.

CONCRETE WORK

(a) Proportioning Mix:

Concrete is to be proportioned in two classes according to use as follows:

Class "A" for reinforced concrete structures, surface courses of highway, and street paving.
Class "C" for interceptor structures, curbs, gutters, driveways, sidewalks, base courses for highway and street paving, thrust blocks, creek crossings, and valve pads.

Class "A" concrete is to be proportioned one 94 lb. sack of Portland Cement, 195 lbs. of sand, 270 lbs. of coarse aggregate, and no admixture. These proportions may be varied by the Engineer after the materials supplied have been tested and proportions for the greatest density and workability determined, provided that no more than 7.25 nor less than 6.50 bags of cement per cubic yard of concrete will be required. Class "A" concrete shall have a minimum compressive strength of 4,000 lbs. per square inch in 28 days. Where instructed by the Engineer, the Contractor shall place reinforcement as outlined in special notes of these specifications.

Class "C" concrete shall have a minimum compressive strength of 3,000 lbs. per square inch and shall contain not less than 5.5 sacks of cement per cubic yard of concrete. The relative amounts of fine and admixture will not be required.

The water used in mixing must be a minimum required for a plastic mix. No water will be permitted to be used for purpose of hastening mixing and reducing of tamping and

vibration.

The water content allowed will be at all times subject to regulations by the Engineer. In the case of Class "A" concrete, not more than five and one-half gallons of water to the bag of cement will be allowed in mixing concrete (or proportionately less when slump is about 4" and/or mix is wet), except in cases where, in the judgement of the Engineer, additional water is necessary to obtain proper results.

Batching equipment shall include scales for weighing contents of wheelbarrows and a device for accurately measuring water by the gallon, to be used for proportioning each batch.

In case of ready-mixed concrete, specifications for proportioning of mixes shall be the same, except that from the manufacturer's experience with his own aggregates, he shall vary proportions of sand and coarse aggregate for the greatest density and workability of mix. Prior to actual delivery of concrete, and at any change of proportioning, the manufacturer shall furnish a statement to the Engineer giving the proportion by weight (dry) of cement and of fine and coarse aggregates that will be used in the manufacture of each mix ordered. Proportions must be approved by the Engineer. Otherwise, proportioning of mix and batching plant shall be according to ASTM Designation C-94, latest revision, specifications for ready-mixed concrete.

(b) Forms:

Forms for concrete with exposed surfaces shall consist of dressed and sized lumber or metal and must match on edges sufficiently to prevent leakage of mortar. Forms shall be built to such accuracy and braced to such an extent that they shall not vary from true lines and surfaces where exposed more than 1/4" before pouring concrete, nor more than 3/8" after pouring. Angle strips (3/4" size) shall be placed in all exposed corners of forms.

(c) Steel Reinforcement Placing:

All such steel shall be delivered in new condition either clean or with only a slight coating of rust. If stored on the site it must be kept under shelter or supporting at least 12" above ground to prevent its becoming coated with dirt and when placed in forms it must be free from scale or dirt.

When placing in forms, steel must be tied together to form a rigid frame before pouring concrete and must be secured in the walls or slabs in such a manner as to insure its holding and position designed for it in the finished work by use of form stands, steel or concrete chairs or spacers. As a rule, steel bars must have a minimum covering of 2" when exposed to air and a minimum of 3" when exposed to earth" of concrete, unless otherwise noted on the plans. All splices shall be 24 diameters long and 1" between spliced bars.

(d) Mixing and Placing:

Concrete shall be thoroughly mixed at least two minutes after all materials, including water, are in the mixer drum having a capacity of at least one sack batch.

Concrete must be poured into forms slowly enough to permit thorough tamping and

vibrating to eliminate any honeycombed surfaces.

Concrete pouring will not be permitted under conditions where there is danger of freezing or when materials are frozen. After pouring, concrete must be protected from freezing weather for at least 72 hours.

Ready-mixed concrete delivery facilities pledged to the concrete pour shall be approved by the Engineer before permission will be given to start the pour. The period between termination of placing by one truck and starting by the next shall not be longer than 10 minutes at temperatures above 70° F., nor longer than 20 minutes below 70° F. The concrete in a truck mixer or agitator must be totally discharged within 1-1/2 hours after the introduction of mixing water to the cement and aggregates. The mixing operation shall begin within 30 minutes after the cement has been intermingled with the aggregates. Otherwise, mixing, mixers, agitators, and inspection shall be according to ASTM Designation C-94, latest revision, specifications for ready-mixed concrete. Non-agitating trucks for hauling concrete from central mixing plant will not be accepted.

(e) Tempering:

All concrete must be kept wet or moist for a period of at least 48 hours after pouring in order to prevent too rapid drying out. In dry weather, wooden forms must be thoroughly wet before concrete is placed in them and must also be kept in this condition during the period above mentioned. Concrete must be covered and kept damp to protect it from the sun as soon as the surfaces are firm enough to allow the placing of such covering or protection.

TESTING CONCRETE

(a) Slump Test:

At least one slump test shall be made before first concrete pour, at the start of pouring any concrete and at each 5 cubic yards deposited during one operation. These shall be made from samples as those taken from cylinder tests and records of same kept therewith. Tests shall be made according to ASTM Designation C-143 and as required under ASTM Designation C-94, for ready-mixed concrete. Mix is designed for a slump test of 2" and not more than 4", except in cases where thin sections would indicate, in the opinion of the Engineer, that a wetter mix is more desirable. The **Contractor** shall furnish necessary equipment for the slump tests.

(b) Cylinder Test:

Cylinder tests will be taken on all important structures such as the storage tank foundation. However, on sewer and waterline jobs requiring only small amounts of concrete per pour, the cylinder tests will be waived. However, should the Engineer have reason to doubt that the concrete being furnished meets the strength requirements, he shall have the right to order cylinder tests according to the following specifications:

At the start of concreting or before, if practical, the **Contractor** shall make from a single batch a set of four (4) cylinders per ASTM Designation C-31. Two (2) shall be tested

at 7 days and two (2) at 28 days per ASTM Designation C-39.

At each time when twenty or more cubic yards of concrete are placed during one operation and when the sum of smaller deposits of concrete equal thirty cubic yards since previous test and at any change in the mix four (4) cylinder tests will be required, two tested 7 days and the other two at 28 days per ASTM Designation C-39. In case of ready-mixed concrete, requirement for testing of ASTM Designation C-94 and C-172 shall be added. Class "A" concrete sampled shall show a compressive strength of not less than 3,000 lbs. per square inch in 7 days and 4,000 lbs. per square inch in 28 days. Class "C" concrete shall have a compressive strength of 3,000 lbs. per square inch in 28 days. Seven (7) day tests on Class "C" concrete shall have the same relation to 28 days requirements.

The **Contractor** shall furnish all equipment for sampling and curing on the job and shall bear the cost of laboratory curing and testing.

PAVEMENT REPLACEMENT:

All replacement pavement shall meet the requirements of KYTC.

TEMPORARY & PERMANENT METER RETIES

As shown on the plans, the Contractor shall be required to re-tie existing water meters to maintain service to existing water customers during his construction for the roadway. These re-ties shall be completed promptly and in a planned manner so to limit times customer is out of service. This bid item covers all cost associated with making these temporary and permanent reties, including all labor, all equipment, and all materials. Fittings used shall be bronze only, Mueller or Ford brand, compression type with stainless steel inserts for P.E. tubing, and shall be approved by the Relocation Engineer before use. “Pack Joint” type fittings shall not be used.

STANDARD METER SETTING EQUIPMENT:

Meter yoke to be Mueller 1404-2 with non-approved Dual Check Valve feature, 7" to 9" riser height with valve for 5/8" x 3/4" meter unit. Unit shall be copper. Service saddle shall be bronze, Mueller Single Strap H-13000 Series. Corp. Stop to be Muller 15008. All the above materials shall be as specified or approved equal.

METERS (STANDARD AND TANDEM):

All meters shall be Badger Model 25, or approved equal, with bronze case, suitable for operation with remote meter reading system. Meter shall be designed to permit the use of both a straight reading, environmentally sealed local register and remote reading electronic register. The registration reading shall be US Gallons. The register shall not be in contact with the water being measured. The transmitter/register devices shall be designed to permit removal and exchange without the removal of the meter from the service installation or interruption of service water supply.
The transmitter shall use the most current and up-to-date battery/s available from the manufacturer as a power source and said battery/s shall be guaranteed for a minimum of ten

(10) years from initiation of operation. **The meter date of manufacture shall be no older than 6 (six) months prior to installation**. The transmitter shall be guaranteed for a minimum of twenty (20) years.

This unit shall be capable of providing optional leak detection when no two hour window of no usage within a 24 hour period is detected. It shall also be capable of tamper detection such as a cut wire. The meters shall be equipped with optional data profiling capability. The meters and meter reading software shall be fully compatible with the existing City of Hazard meter reading software and hardware and shall be compatible with exiting City of Hazard billing software. The Radio Read equipment shall be Badger Orion, or Engineer approved equal.

TANDEM METER SETTING EQUIPMENT:

Tandem meter sets are shown on the drawings as a Standard Meter Set accompanied by a small square and connecting line between the two. Tandem meter sets will use the same service saddle, meter, meter box & lid, and corp stop as specified for the Standard meter. The meter yoke shall be a Mueller 1404-012 with H14227 end connection and “S” bar. The PRV used shall be a Wilkens 600, 3/4", PRV factory preset at 45 psi.

METER BOX AND COVER:

In low traffic areas, as designated by the Engineer, high impact plastic meter boxes having the same material specifications as those given for the ARV box shall be used. The box shall be Mid States Meter MS 183010, with 18" minimum inside diameter and 30" minimum depth (24” min. depth may be required by the Owner, Contact Engineer), or approved equal. The cover shall be Tyler 6880 Cast Iron, Ford Type C only in high traffic areas, Prosource Water Products, Ltd., PWP-PS500-TLWCL/TBP with small pentagon nut, cam lock, and locking transponder bracket for radio read in all other areas, appropriately sized, or approved equal.

In high traffic areas, meter boxes shall be equal in all respects to Cloud Concrete UT-050 having an inside diameter of 18" and a depth of 24". When using the concrete box the lid shall be as specified above. The decision of the Engineer is final in regards use of concrete boxes.

CRUSHED STONE MATERIALS:

All Crushed Stone materials shall conform to the applicable sections of Standard Specifications for Road & Bridge Construction, KYTC. The Crushed Stone Bid Item shall include all required materials ranging form DGA to #2 stone as indicated in the above specifications. The Engineer will only pay for crushed stone where original delivery tickets are provided for his records. Class II & Class III Stone is Channel Lining, Class II & Class III, as designated in the above specifications.

TAPPING SLEEVE & TAPPING VALVE:

The tapping sleeve shall be a Mueller H-304SS or Cascade equivalent, suitable for operation at pressures of up to 250 psi, and designed for the pipe type tapped. The tapping valve shall be a Mueller T-2360 resilient wedge, flanged by mechanical joint, suitable for operation of pressures to 250 psi. The discharge side of the tapping valve shall be equipped w/ grip ring.

WATERLINE MARKERS:

The drawings designate the required marker type, dimensions, etc.

GRIP RINGS:

As noted on the drawings and as given in these specifications, all fittings, regardless of type, shall be equipped with grip rings at all branches, inlets and outlets. Grip rings 4" and greater shall be Romac. Grip rings 3" and smaller shall be Midco, or equivalent.

MAG METER:

An electromagnetic meter shall be installed where indicated on the Plans. Mag Meter is shown as 4" in 6". What this means is the use of a 4" mag meter placed within 6" piping. The Bid Unit Cost shall include the concentric reducers, spool pieces, M.J. sleeves, Foster adapters, as indicated on the Drawings. The Bid Unit Price for the mag meter shall also include either the exterior enclosure as detailed on the Plans, and all attendant conduiting. Also included in the mag meter placement is the 36" dia. plastic vault, 36" extension ring (Ford or equal), and standard meter cover with frame for 20" tile size. The meter cover shall be the same as that previously specified for meter covers. The 36" plastic vault shall have the same material properties as the meter box previously specified. **Valves and boxes are excluded from this item bid unit cost,** and will be paid at their own bid unit cost.

The mag meter shall be a Badger M-5000 when battery power is required, a Badger M-2000 when 120 volt power is used, or Engineer approved equal. If the Drawings show a circled "P" this indicates that an exterior enclosure mounting will be provided with attendant battery power and use of the Badger M-5000. As indicated on the Drawings the meter shall be equipped with a junction box for remote amplifier. All mag meters shall be submersible NEMA 6P rated. All mag meters shall be equipped with stainless steel grounding rings. The meter shall be capable of plus or minus 0.50% accuracy independent of fluid viscosity, density, and temperature. The mag meter shall be fully capable of communication with Badger Orion Radio Read Equipment. The remote amplifier shall be installed in a stainless steel 4X lockable enclosure for exterior mountings.