Exhibit 8

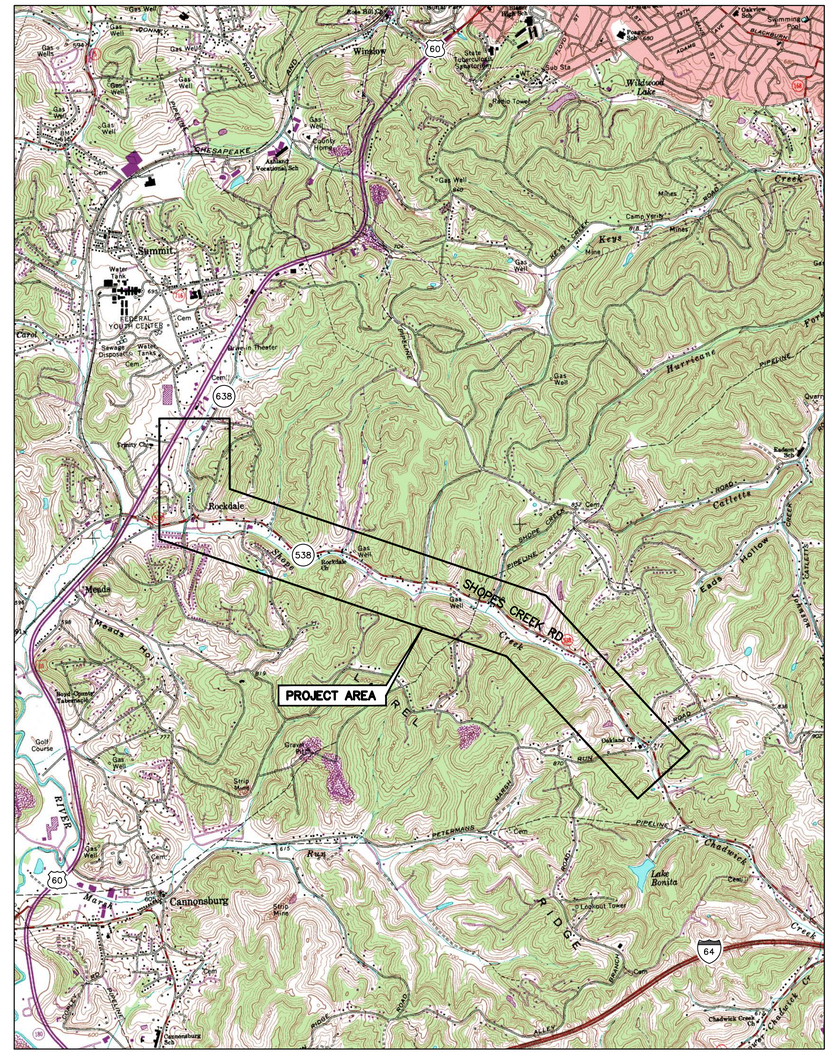
Engineering Plans, Maps, and Drawings

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA

CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY
FEBRUARY 2023

Cannonsburg Water District
Quality on Tap

SHEET INDEX



USGS MAP
1" = 2,000'

CONTRACT NO.
691-21-01
2023

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
50144
LICENSED
PROFESSIONAL ENGINEER
11/13/24
ELECTRICAL

STATE OF KENTUCKY
DWAYNE BERNARD
50703
LICENSED
PROFESSIONAL ENGINEER
11-12-24
CIVIL

STATE OF KENTUCKY
DAVID M. HOWELL
29100
LICENSED
PROFESSIONAL ENGINEER
11/13/24
STRUCTURAL

STATE OF KENTUCKY
JOHN D. PRINCE
22585
LICENSED
PROFESSIONAL ENGINEER
11-13-24
HVAC/PLUMBING

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

FACSIMILES OF LICENSED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR SEALS, IF AFFIXED TO THIS DOCUMENT, SHALL BE CONSIDERED LEGITIMATE ONLY IF SIGNED AND DATED BY THE REGISTRANT.

BUD NOTE:

KENTUCKY STATUTES (KRS 367.4901 THROUGH 367.4917) REQUIRE THAT ALL EXCAVATORS PLANNING EXCAVATION OR DEMOLITION WORK SHALL NOTIFY ALL UTILITY COMPANIES IN THE AREA AND/OR AN UNDERGROUND PROTECTION SERVICE SUCH AS BUD (1-800-752-6007 OR 811) AT LEAST TWO (2) WORKING DAYS BEFORE COMMENCING WORK TO ALERT UTILITY COMPANIES IN THE AREA WITH UNDERGROUND FACILITIES OF THE PLANNED EXCAVATION OR DEMOLITION ACTIVITIES.

- [x] CLIENT REVIEW
- [x] BELL (QA) REVIEW
- [x] DIVISION OF WATER REVIEW
- [x] BID DOCUMENTS
- [ ] RECORD DRAWINGS

bell engineering
2480 fortune drive, suite 350
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GENERAL LEGEND FOR BOOSTER PUMP STATION

SITE PLAN

EXISTING		NEW
	ASPHALT ROADWAY	
	GRAVEL OR D.G.A. ROADWAY	
890	CONTOUR	
	REGRADE	890
	FENCE	
	STRUCTURES	
	WALKWAYS	
	BORINGS/CORINGS	3
	NORTH ARROW	
x 672.5	SPOT ELEVATION	674.4
	℄ DRAINAGE DITCH	
	EDGE OF WATER	
	LIGHT POLE	
	POWER POLE	
	MANHOLE	
674.43	PIPE INVERT ELEVATION	674.43
	SLIP JOINT & MECH. JT. (PER SPEC.)	
	PIPELINE DIRECTION OF FLOW	
	FOUNDATION DRAIN PIPING	
	SURFACE DRAIN BOX (CATCH BASIN)	CB
B.M.	BENCH MARK	
	HYDRANT	
	HYDRANT W/HOSE RACK	
	VALVE	
	WATER METER	

GRAPHIC SCALE 0 20 40 60 1"=20'

REMOVE OBJECT/DEMOLITION — REMOVE

BASELINE

ASPHALT PAVING

PAVING OVERLAY

CONCRETE PAVING

GRAVEL DRIVE

ITEMS TO BE DEMOLISHED

ITEMS TO BE DEMOLISHED/ ABANDONED IN PLACE

STRUCTURES

GLASS

DOOR

WINDOW

LINTEL TYPE — DOOR/WINDOW IDENTIFICATION

DOOR/WINDOW OPENING MARK

WATER LEVEL

4 — GATE/GUIDE IDENTIFICATION

POLYETHYLENE FILM

FILTER FABRIC

SECTION DESIGNATION — A — 672 — REFERENCE SHEET NUMBER — SECTION CUT

ROCK

EARTH

CRUSHED STONE

NEW STRUCTURAL CONCRETE

EXISTING CONCRETE

PRECAST CONCRETE

2" — GROUT 2" THK OR LESS

GROUT 2" THK OR MORE

NEW BRICK

NEW CONC. BLOCK

NORTH — NORTH ARROW

VALVES & PIPING

(BUILDING PLANS & SECTIONS)

EXISTING OR SCHEMATIC		NEW
	PRESSURE RELIEF (FLAP) VALVE	
PN	PNEUMATICALLY OPERATED VALVE	PN
H	HYDRAULICALLY OPERATED VALVE	H
E	ELECTRICALLY OPERATED VALVE	E
	CHECK VALVE	
	GATE or PLUG VALVE	
	BUTTERFLY VALVE	
	3-WAY VALVE	
	4-WAY VALVE	
	PINCH VALVE	
D	MAGNETIC FLOW METER	D
BFP	BACKFLOW PREVENTION DEVICE	BFP
	90° BEND	
	90° BEND TURNED DOWN/AWAY	
	90° BEND TURNED UP/FORWARD	
	BASE BEND	
	CROSS	
	TEE	
	TEE TURNED DOWN/AWAY	
	TEE TURNED UP/FORWARD	
	BASE TEE	
	WYE/LATERAL	
	FLANGED COUPLING ADAPTER W/ANCHORS	
	COUPLING	
	CONCENTRIC REDUCER	
ECC	ECCENTRIC REDUCER	
	BLIND FLANGE OR PLUG	
	UNION	
	FLANGED PIPE	
	DUCTILE IRON MECHANICAL JOINT PIPE	
	REINFORCED CONCRETE PIPE	
PVC	PLASTIC PIPE	
Cu.	COPPER PIPE	Cu.

NOTE:

EXISTING PIPE FITTINGS TO BE RELOCATED ARE SHOWN AS SINGLE LINE PIPING, DARKER THAN OTHER EXISTING PIPING.

LIST OF ABBREVIATIONS

AL.	–	ALUMINUM	INFL.	–	INFLUENT
ALUM	–	ALUMINUM SULFATE	INV.	–	INVERT
ALS	–	ALUMINUM SULFATE	MH	–	MANHOLE
APPROX.	–	APPROXIMATELY	MJ	–	MECHANICAL JOINT
B'FLY	–	BUTTERFLY VALVE	NPW	–	NON–POTABLE WATER
BFLY	–	BUTTERFLY VALVE	NTS	–	NOT TO SCALE
BV	–	BUTTERFLY VALVE	ODE	–	OXIDATION DITCH EFFLUENT
CE	–	CLARIFIER EFFLUENT	ODI	–	OXIDATION DITCH INFLUENT
CIRC.	–	CIRCULAR	P	–	POLYMER SOLUTION
CK	–	CHECK	P.S.	–	PUMP STATION
CLI	–	CLARIFIER INFLUENT	PE	–	POLYETHYLENE
CONC.	–	CONCRETE	POT.	–	POTABLE WATER
CONT.	–	CONTINUOUS	PS	–	PLANT SEWER
Cu.	–	COPPER	PSD	–	PLANT SEWER PUMP STATION DISCHARGE
CV	–	CHECK VALVE	REG.	–	REGRADE
D	–	DRAIN	REGR.	–	REGRADE
DF	–	DISINFECTANT FEED	PSW	–	PANT SERVICE WATER
DR	–	DRAIN	PW	–	PLANT WATER
DIA.	–	DIAMETER	PW–NPW	–	PLANT WATER–NON–POTABLE WATER
D.I.	–	DUCTILE IRON	RAS	–	RETURN ACTIVATED SLUDGE
DIMJ	–	DUCTILE IRON MECHANICAL JOINT	RJ	–	RESTRAINED JOINT
EFF.	–	EFFLUENT	RS	–	RAW SEWAGE
EL.	–	ELEVATION	RWI	–	RAW WATER INTAKE
E.F.	–	EACH FACE	SCS	–	SCREENED SEWAGE
E.S.	–	EACH SIDE	SPECS	–	SPECIFICATIONS
EX.	–	EXISTING	SPA.	–	SPACED
FDN.	–	FOUNDATION	SS	–	SANITARY SEWER
FE	–	FINAL EFFLUENT	STN. STL.	–	STAINLESS STEEL
FFE	–	FINISHED FLOOR ELEVATION	T/S	–	TOP OF SLAB
GALV.	–	GALVANIZED	SPECS.	–	TYPICAL
GV	–	GATE VALVE	WAS	–	WASTE ACTIVATED SLUDGE
HDPE	–	HIGH DENSITY POLYETHYLENE	WTP	–	WATER TREATMENT PLANT
HR	–	HANDRAIL	WWTP	–	WASTEWATER TREATMENT PLAN
HWL	–	HIGH WATER LEVEL			

(OTHER LEGENDS MAY EXIST ON OTHER DRAWINGS WHICH CONTAIN SYMBOLS OR ABBREVIATIONS NOT SHOWN HERE)

WATER MAIN LEGEND

EXISTING		PROPOSED
W	WATER MAIN	
	DIMJ BEND (INCLUDED IN UNIT PRICE OF PIPE)	
	SLEEVE	
	WATER VALVE	
	FLUSHING HYDRANT	
	TEST METER ASSEMBLY	
	WATER LINE MARKER	
	WATER METER ASSEMBLY	
PRV	WATER METER ASSEMBLY W/ (PRESSURE REDUCER)	PRV
A M	AIR RELEASE VALVE ASSEMBLY (AUTOMATIC, MANUAL)	A M
D	CROSS DRAIN PIPE	D
	COVER (CASING) PIPE	
	DIRJ W/ FIELD LOK	
T	EXISTING COMM MANHOLE	
	EXISTING CONCRETE BOX CULVERT SIZE LISTED IS APPROXIMATE	

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

GENERAL NOTES

1. EFFORTS HAVE BEEN MADE TO INDICATE LOCATIONS OF EXISTING STRUCTURES, PIPING AND UTILITIES. HOWEVER, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE SITE AND OTHER EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN INFORMATION DEPICTED BY THE CONSTRUCTION DRAWINGS AND ACTUAL FIELD CONDITIONS, WHICH WOULD SIGNIFICANTLY ALTER THE DESIGN INTENT OF CONSTRUCTION DRAWINGS PRIOR TO COMMENCING HIS CONSTRUCTION OPERATIONS. DIMENSIONS OF EXISTING STRUCTURES AND/OR SITE RESTRICTIONS ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND CONFIRM ALL DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES AND TOPOGRAPHY IN THE FIELD NECESSARY FOR HIS CONSTRUCTION OPERATION.
2. THE CONTRACTOR SHALL USE ALL POSSIBLE CARE DURING EXCAVATION ON THE PROJECT SO AS NOT TO DISTURB OR DAMAGE ANY EXISTING UTILITY OR STRUCTURE NOT SCHEDULED FOR DEMOLITION WHETHER DEPICTED OR NOT IN THE CONSTRUCTION DRAWINGS. ANY DAMAGE TO THE AFORE MENTIONED ITEMS CAUSED DIRECTLY OR INDIRECTLY BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER TO A CONDITION EQUAL TO THAT WHICH EXISTED PRIOR TO BEING DAMAGED.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL EXISTING UTILITY OWNERS AND HAVE THEM FIELD LOCATE THEIR EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
4. THE CONTRACTOR SHALL CONTACT AND OBTAIN THE PERMISSION OF EXISTING UTILITY OWNERS 48 HOURS (MIN.) PRIOR TO ANY CONSTRUCTION ACTIVITY INTERRUPTING OPERATION OF SAID UTILITY.

KENTUCKY TRANSPORTATION CABINET (KYTC) NOTES

1. WATER LINES TO BE CONSTRUCTED WITHIN THE KENTUCKY TRANSPORTATION CABINET RIGHT–OF–WAY: TRENCHES SHALL BE OF A DEPTH SUFFICIENT TO PROVIDE A MINIMUM COVER OF 42" FROM THE GROUND SURFACE TO THE TOP OF THE PIPE AND BE LOCATED APPROXIMATELY AS SHOWN UNLESS OTHERWISE NOTED. SEE INDIVIDUAL SHEETS FOR DETAILS.
2. ALL BORES UNDER KYTC RIGHT–OF–WAY: SHALL BE A MINIMUM OF 42" DEPTH UNDER BOTTOM OF DITCH LINE TO TOP OF PROPOSED BORE AND/OR CASING PIPE ON BOTH SIDES OF THE HIGHWAY.
3. ROCK BLASTING: THERE SHALL BE NO BLASTING WITHIN STATE RIGHT–OF–WAY WITHOUT WRITTEN CONSENT FROM THE KENTUCKY TRANSPORTATION CABINET.
4. PROTECTION OF EXISTING PAVING: CARE SHALL BE TAKEN BY THE CONTRACTOR TO AVOID CRACKING OR BREAKING THE BITUMINOUS PAVING. ALL DAMAGE TO THE EXISTING PAVING CAUSED BY THE CONTRACTOR'S OPERATION SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER. PAVING PROTECTION SHALL BE ACCOMPLISHED BY THE USE OF RUBBER AND STREET PADDED MACHINERY OR OTHER APPROVED EQUIPMENT WELL SUITED FOR THIS TYPE OF CONSTRUCTION.
5. BANK AND DITCH PROTECTION EXCAVATION: DURING CONSTRUCTION ALL EMBANKMENTS, REFILLS AND EXCAVATIONS SHALL BE KEPT SHAPED AND DRAINED BY THE CONTRACTOR. DITCHES AND DRAINS ALONG THE HIGHWAYS SHALL BE MAINTAINED IN SUCH A MANNER AS TO DRAIN EFFECTIVELY AT ALL TIMES.
6. PRIVATE ENTRANCE ROAD: ALL ROADWAYS AND DRIVEWAYS WITHIN THE WORK LIMITS OF STATE RIGHT–OF–WAYS SHALL BE REFILLED TO THE NATURAL SURFACE OF THE GROUND WITH APPROVED MATERIAL. THE MATERIAL SHALL BE PLACED AND COMPACTED TO A SMOOTHNESS SUITABLE FOR TRAFFIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THESE ROADWAYS UNTIL THE RESTORATION IS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL NOTE THAT ALL PRIVATE BUSINESS AND RESIDENTS ALONG THE ROUTE OF THE PROPOSED CONSTRUCTION MUST HAVE ACCESS TO THEIR PROPERTIES AT ALL TIMES DURING CONSTRUCTION.
7. PROTECTION OF EXISTING DRAINAGE CULVERTS: AT LOCATIONS WHERE THE PROPOSED WATER MAIN IS PARALLEL WITH OR CROSSING AN EXISTING STORM SEWER, THE COST OF RELAYING EXISTING CULVERT PIPES OR THE EXTRA DEPTH REQUIRED TO AVOID THE EXISTING CULVERT IS CONSIDERED INCIDENTAL TO CONSTRUCTION AND IS NOT A PAY ITEM.
8. SOME EXISTING UTILITIES HAVE NOT BEEN SHOWN: THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE REPRESENTATIVES OF THE VARIOUS UTILITIES WHEN WORKING NEAR ANY EXISTING UTILITY. NO ADDITIONAL PAYMENT TO THE CONTRACTOR WILL BE MADE FOR EXTRA DEPTH REQUIRED TO AVOID ANY EXISTING UTILITY.
9. FINAL LOCATION OF FLUSHING HYDRANT ASSEMBLIES SHALL BE MADE IN THE FIELD IN CONJUNCTION WITH KYTC PERSONNEL. BREAKAWAY COMPONENTS SHALL BE USED AT NO ADDITIONAL COST TO THE OWNER IF THE FLUSHING HYDRANT ASSEMBLIES CANNOT BE LOCATED OUTSIDE THE CLEAR ZONE.
10. PRIOR TO BEGINNING OF WORK ON KENTUCKY TRANSPORTATION RIGHTS–OF–WAY THE CONTRACTOR SHALL HAVE COMPLETED THE KENTUCKY TRANSPORTATION CABINET'S WORK ZONE TRAFFIC CONTROL EMPLOYEE QUALIFICATION PROGRAM. INDIVIDUALS PERFORMING FLAGGING OPERATIONS ON ANY KENTUCKY ROADWAY MUST BE QUALIFIED AND CERTIFIED BY THE KENTUCKY TRANSPORTATION CABINET. INDIVIDUALS WHO PLACE, MONITOR, AND MAINTAIN TRAFFIC CONTROL DEVICES ON PUBLIC ROADWAYS IN KENTUCKY SHALL HAVE SUCCESSFULLY COMPLETED THE WORK ZONE TRAFFIC CONTROL TECHNICIAN PROGRAM. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PREPARING AND IMPLEMENTING THE TRAFFIC CONTROL PLAN, THE INDIVIDUALS RESPONSIBLE FOR THIS WORK SHALL HAVE SUCCESSFULLY COMPLETED THE WORK ZONE TRAFFIC CONTROL SUPERVISOR PROGRAM. FOR MORE INFORMATION ON THE WORK ZONE TRAFFIC CONTROL EMPLOYEE QUALIFICATION PROGRAM AS PRESENTED BY THE TECHNOLOGY TRANSFER PROGRAM, KENTUCKY TRANSPORTATION CENTER, UNIVERSITY OF KENTUCKY CALL THE CENTER'S TOLL FREE NUMBER 1–800–432–0719 OR CONTACT THE DEPARTMENT OF HIGHWAYS, DISTRICT 9, 822 ELIZAVILLE, FLEMINGSBURG KENTUCKY 41041, PHONE 606–854–2551.
11. ALL NEW WATER LINES SHALL BE INSTALLED AT OR BEYOND THE BACK OF THE DITCH LINE. NO VALVES OR LINES SHALL BE INSTALLED IN THE FLOWLINE OF THE DITCH REGARDLESS OF THE DEPTH.
12. ALL NEW WATER LINE SHALL BE INSTALLED AROUND ANY KYTC DRAINAGE STRUCTURES AT DISTANCE WHICH WILL NOT INTERFERE WITH MAINTENANCE OPERATIONS. INSTALLING OVER TOP OF DRAINAGE STRUCTURES IS PROHIBITED.
13. IN THE EVENT HIGHWAY ENTRANCE PIPES ARE DAMAGED AND OR REMOVED DURING THE CONSTRUCTION PROCESS THEY SHALL BE REPLACED. REPLACEMENT PIPES SHALL HAVE A MINIMUM DIAMETER OF 15 INCHES REGARDLESS OF THE PIPE DIAMETER BEING REPLACED.
14. FACILITIES WITHIN THE ROW SHALL BE RESTORED TO THE EQUIVALENT OF THEIR ORIGINAL CONDITION.

NOTES FOR WATER LINES

1. MINIMUM COVER OVER WATER LINES TO BE 36 INCHES (42 INCHES ON KYTC R–O–W) UNLESS OTHERWISE NOTED.
2. MINIMUM COVER OVER VALVE NUT TO BE 12 INCHES (NO PAYMENT FOR EXTRA DEPTH). MAXIMUM COVER OVER VALVE NUTS TO BE 30 INCHES (NO EXTRA PAYMENT FOR REQUIRED EXTENSIONS).
3. CONCRETE BLOCKING OF FITTINGS REQUIRED AT NO EXTRA COST.
4. THE CONTRACTOR SHALL HAVE THE OPTION OF USING FITTINGS OR EXTRA DEPTH TRENCHING AT ALL LOCATIONS WHERE VERTICAL BENDS ARE SHOWN. EITHER METHOD WILL BE AT NO EXTRA COST TO OWNER AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. LAY NEW LINES UNDER EXISTING UTILITY LINES, EXCEPT AS OTHERWISE NOTED OR DETERMINED IN THE FIELD. (NO PAYMENT FOR EXTRA DEPTH TRENCH).
6. ALL PVC PIPE TO BE SDR–17 CLASS 250.
7. ALL D.I. PIPE TO BE CLASS 350.
8. ALL POLYETHYLENE PIPE TO MEET ASTM D3350–05 LATEST REVISION AND BE PER CLASS OF PIPE AND PRESSURE AS SHOWN ON PLANS AND FORM OF PROPOSAL.
9. ANY SALVAGED MATERIALS WHICH HAVE NOT BEEN SPECIFIED TO BE REUSED SHALL BE REMOVED FROM THE JOB SITE BY THE CONTRACTOR AND PLACED AT AN OWNER DESIGNATED AREA AT NO EXTRA COST TO OWNER.
12. LINE MARKERS TO BE LOCATED AT PROPERTY AND OR FENCE LINES AS DIRECTED BY THE ENGINEER.
13. ALL DISTURBED DRIVEWAYS, ROADS, PULL–OFF AREAS, ENTRANCES WILL BE RESTORED PER CONTRACT SPECIFICATIONS.
14. ALL TIE–IN LOCATIONS SHALL BE UNCOVERED (TYPE OF EXISTING MATERIALS AND LOCATION VERIFIED) PRIOR TO CONSTRUCTION TO MAINTAIN PROPER ALIGNMENT AND ELEVATION OF NEW CONNECTION. NO PAYMENT ALLOWED FOR SEARCH OR EXPLORATION FOR EXISTING LINES.
15. CONTRACTOR SHALL INVENTORY REQUIRED MATERIALS, TRENCH DEWATERING EQUIPMENT, AND ASSEMBLE IF NECESSARY ALL REQUIRED FITTINGS PRIOR TO CUT–INS OR TIE–INS TO INSURE MINIMUM "DOWN TIME" FOR CONNECTION.
16. SURFACE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.
17. METERS SHALL BE FIELD LOCATED.
18. ALL PIPE FITTINGS SHALL BE D.I.M.J. AND SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WATER LINE OR APPURTENANCES.
19. THE CONTRACTOR SHALL PROFILE ALL ROAD CROSSINGS AND CREEK CROSSINGS AND SUBMIT GATHERED SURVEY DATA TO THE ENGR. FOR REVIEW AND APPROVAL PRIOR TO THE COMMENCEMENT OF ANY DRILLING, BORING OR OPEN CUTTING ACTIVITIES.
20. PAYMENT FOR WATER LINE INSTALLATION WILL BE "FIELD" MEASURED EACH DAY BY THE CONTRACTOR AND RESIDENT PROJECT REPRESENTATIVE. ALL FOOTAGE TO BE AGREED ON EACH DAY. PAYMENT TO BE PER ACTUAL LINEAR FOOT OF PIPE INSTALLED (COUNTING OF PIPE JOINTS WILL NOT BE ALLOWED).
21. HIGH DENSITY POLYETHYLENE DIRECTIONAL DRILLS UNDER STREAMS, CREEKS, DRAINAGE STRUCTURES , ETC. ARE TO BE BID LUMP SUM. DISTANCE/STATION NUMBERS LISTED IS APPROXIMATE HORIZONTAL DISTANCE ONLY. CONTRACTOR IS RESPONSIBLE TO DETERMINE THE ACTUAL LENGTH OF THE DRILL AND PIPE REQUIRED WHICH SHALL BE INCLUDED IN THE LUMP SUM BID COMPLETE, INCLUDING ALL TRANSITION FITTINGS. NO ADDITIONAL PAYMENT WILL BE MADE.
22. ALL WATER METERS SHOWN ARE EXISTING. EACH EXISTING WATER METER IS TO BE RECONNECTED TO THE NEW WATER MAIN. NEW SERVICE LINE SHALL BE INSTALLED FROM THE NEW SADDLE AND CORPORATION STOP TO THE EXISTING METER SETTER USING 3/4" OR 1" MUNICIPEX SERVICE LINE WITH STAINLESS STEEL STIFFENERS.
23. NATURAL GAS SERVICE LINES TO RESIDENTS ARE NOT SHOWN. CONTRACTOR SHALL HAVE THE SERVICE LINE MARKED BY CONTACTING BUD 811 OR THE GAS UTILITY COMPANY PRIOR TO CONSTRUCTION.
24. EXTREME CARE SHALL BE TAKEN WHEN LOCATING EXISTING UTILITIES. ALL EXISTING UTILITIES SHALL BE UNCOVERED USING HYDRO EXCAVATION METHOD.
25. ALL TRANSITION FITTINGS AND APPURTENANCES REQUIRED TO CONNECT POLYETHYLENE PIPE TO VALVES AND OTHER PIPE MATERIAL SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE POLYETHYLENE PIPE INSTALLATION. NO ADDITIONAL PAYMENT WILL BE MADE.

NOTE:
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X — NOTE:
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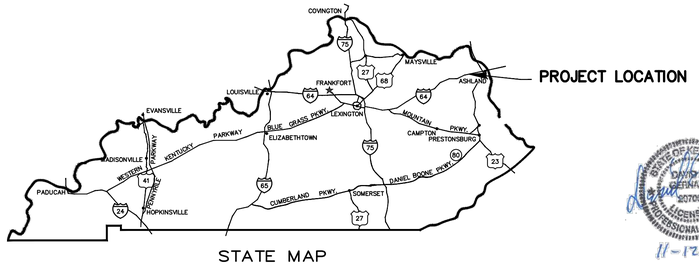
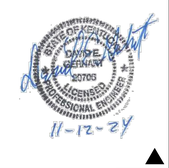


STATE MAP
NOT TO SCALE



		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

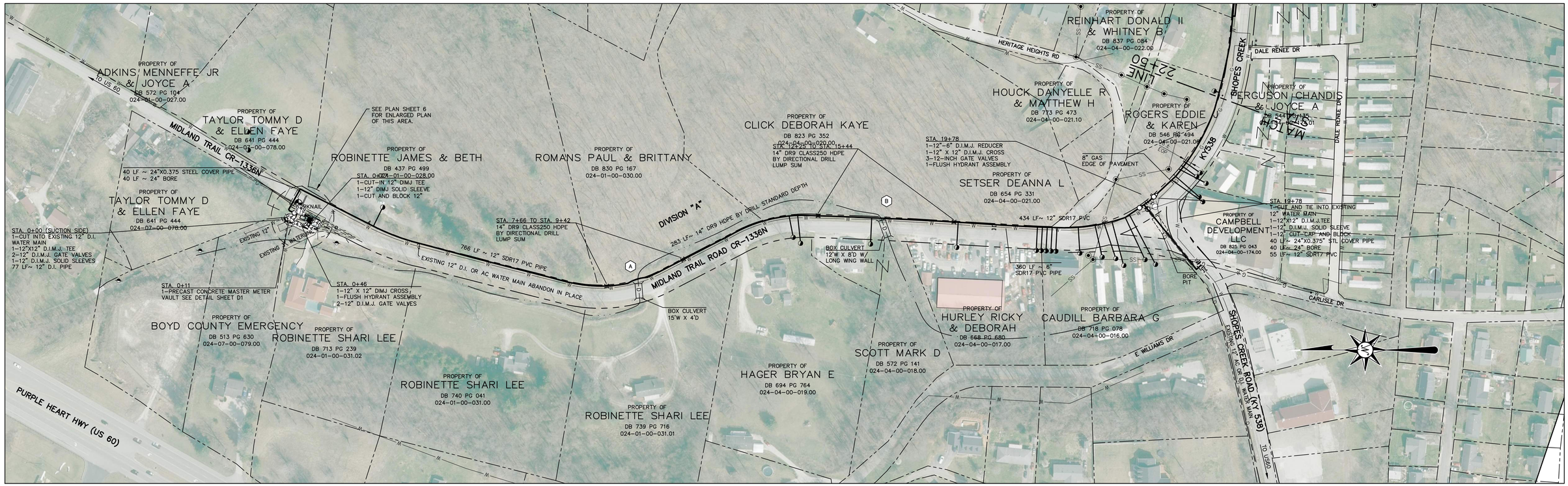
SCALE: AS NOTED

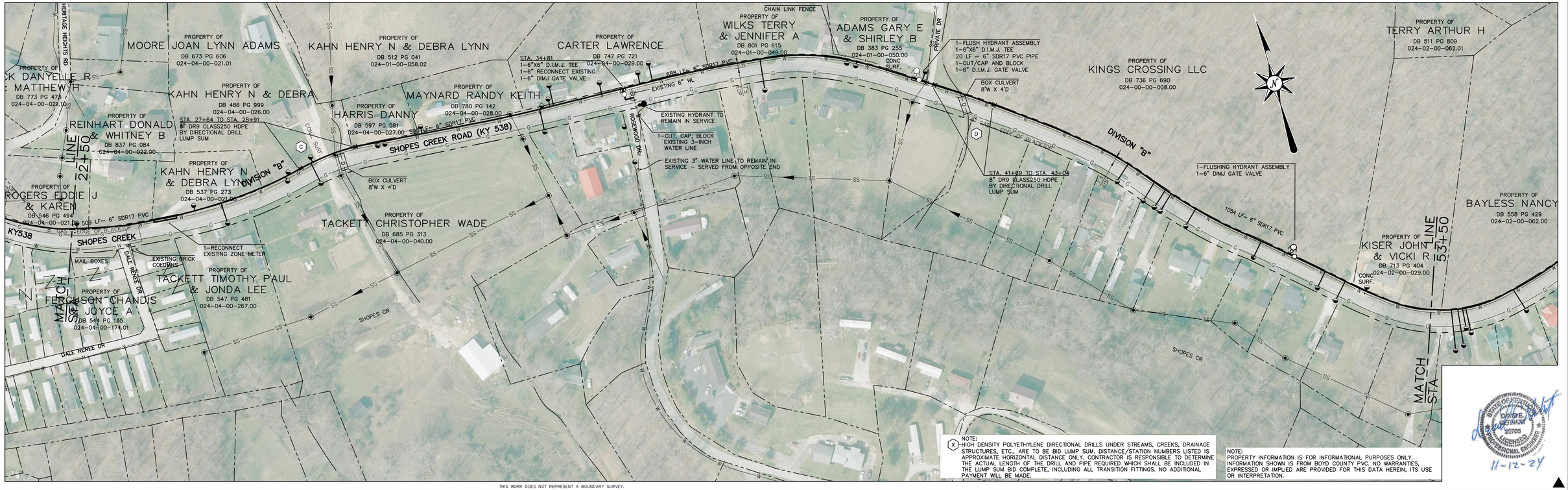
bell engineering
Lexington, KY (859) 278–5412
Hopkinsville, KY (270) 886–5466
Somerset, KY (606) 485–4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

PROJECT MAP, GENERAL NOTES & LEGEND

DIVISION	–
CONTRACT NO.	691–21–01
DATE	SEPTEMBER 2021
SHEET NO.	01 OF 17





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STATE OF KENTUCKY DAVID E. GERHART 20703 LICENSED PROFESSIONAL ENGINEER
11-12-24

THIS WORK DOES NOT REPRESENT A BOUNDARY SURVEY.

		DATE	BY	REVISION
DESIGNER	ELL			
DRAWN	CRB			
CHECKED	ELL			
APPROVED	DEG			

GRAPHIC SCALE

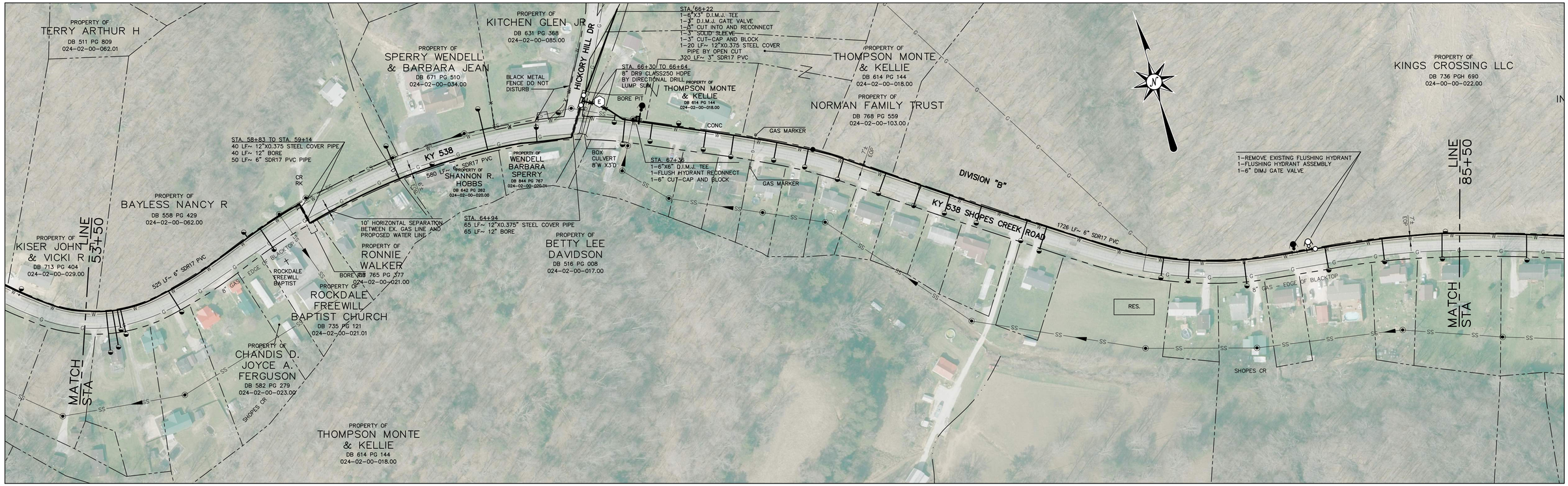
SCALE: 1" = 100'

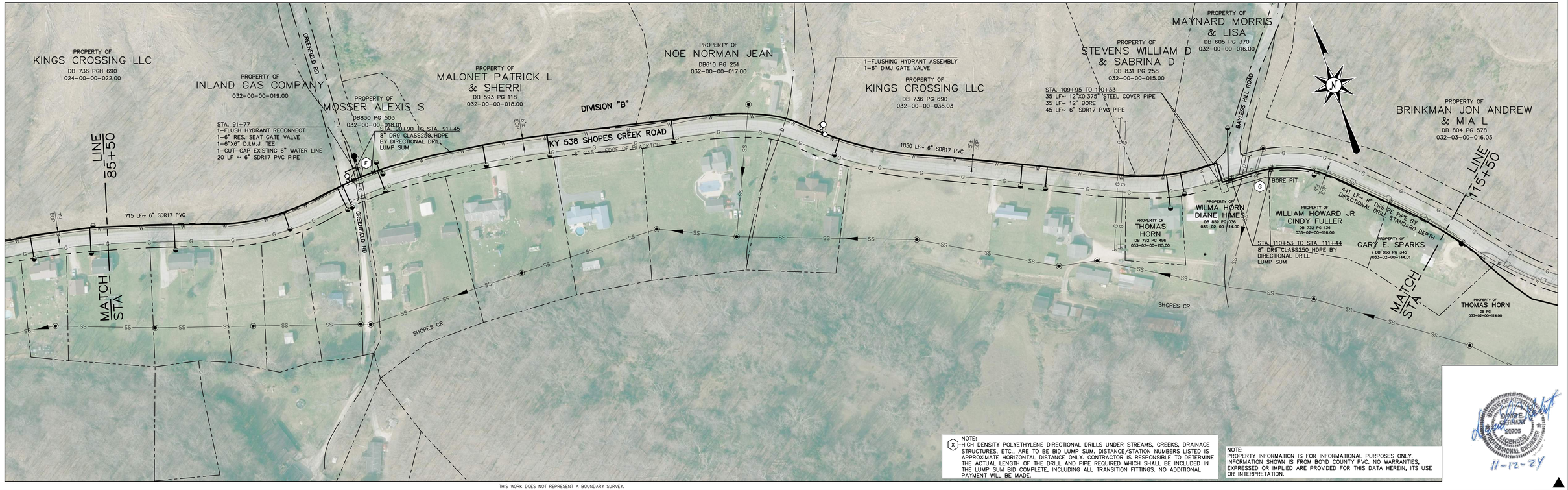
bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ALONG KY 638 MIDLAND TRAIL ROAD
AND KY 538 SHOPES CREEK ROAD

DIVISION	"A" & "B"
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	02 OF 17





NOTE:
(X) HIGH DENSITY POLYETHYLENE DIRECTIONAL DRILLS UNDER STREAMS, CREEKS, DRAINAGE STRUCTURES, ETC., ARE TO BE BID LUMP SUM. DISTANCE/STATION NUMBERS LISTED IS APPROXIMATE HORIZONTAL DISTANCE ONLY. CONTRACTOR IS RESPONSIBLE TO DETERMINE THE ACTUAL LENGTH OF THE DRILL AND PIPE REQUIRED WHICH SHALL BE INCLUDED IN THE LUMP SUM BID COMPLETE, INCLUDING ALL TRANSITION FITTINGS. NO ADDITIONAL PAYMENT WILL BE MADE.

NOTE:
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STATE OF KENTUCKY DAVID E. GERNERT 20703 LICENSED PROFESSIONAL ENGINEER
11-12-24

THIS WORK DOES NOT REPRESENT A BOUNDARY SURVEY.

		DATE	BY	REVISION
DESIGNER	ELL			
DRAWN	CRB			
CHECKED	ELL			
APPROVED	DEG			

GRAPHIC SCALE

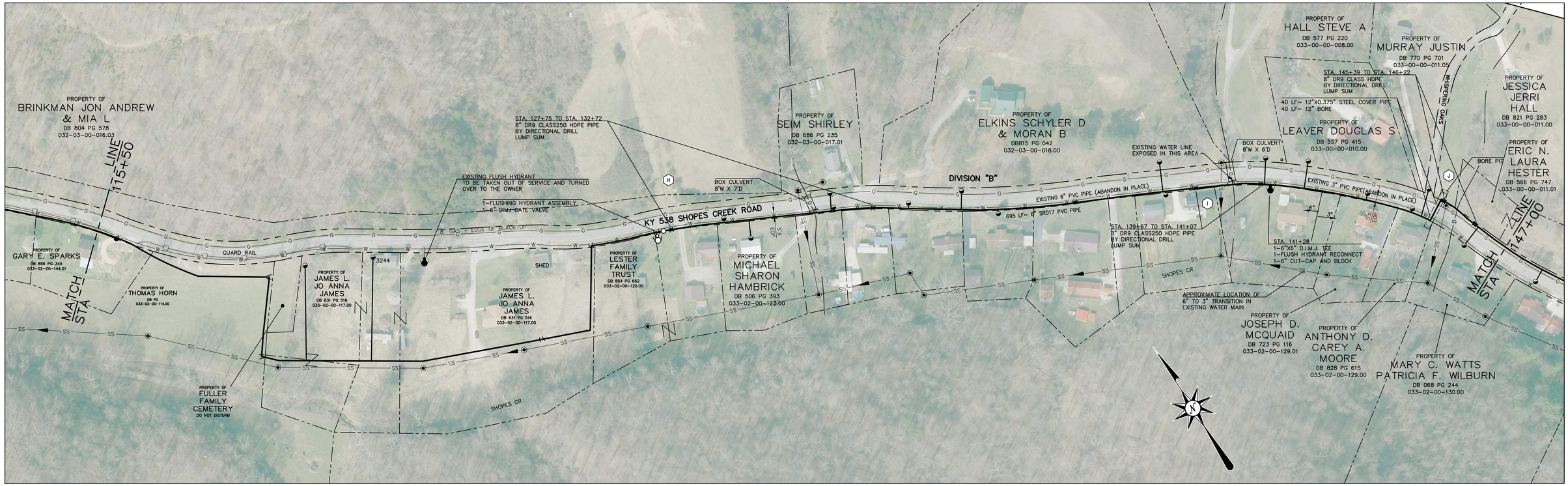
SCALE: 1" = 100'

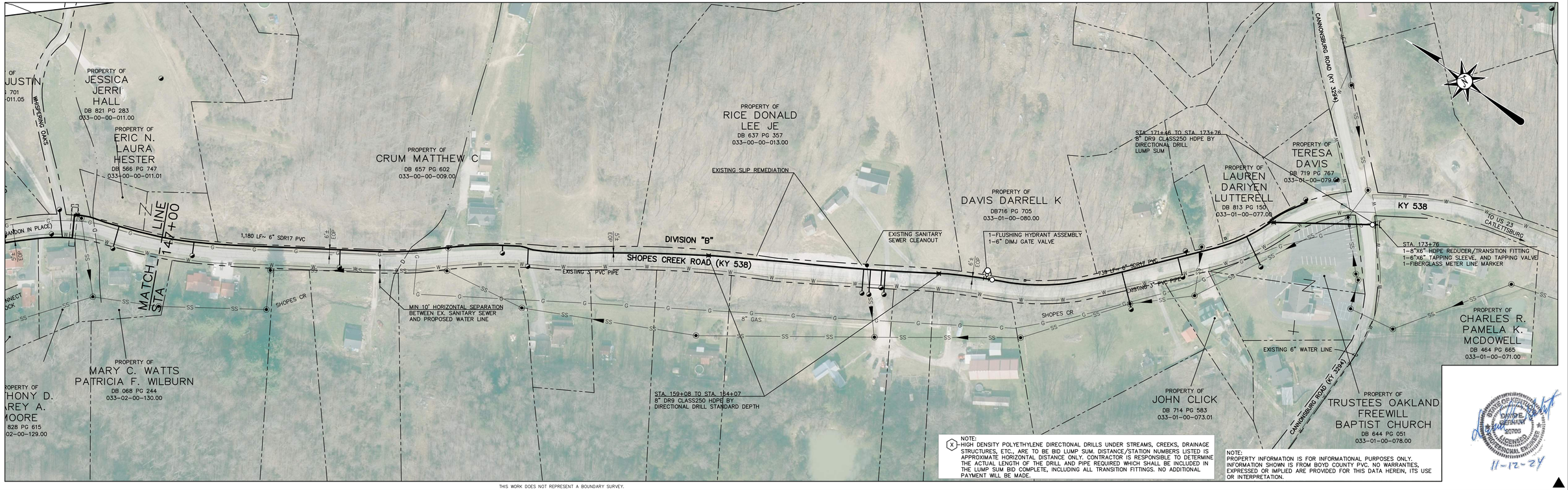
bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ALONG KY 538 SHOPES CREEK ROAD

DIVISION	"B"
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	03 OF 17





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STATE OF KENTUCKY DAVID E. GERNERT 20703 LICENSED PROFESSIONAL ENGINEER
11-12-24

THIS WORK DOES NOT REPRESENT A BOUNDARY SURVEY.

		DATE	BY	REVISION
DESIGNER	ELL			
DRAWN	CRB			
CHECKED	ELL			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: 1" = 100'

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WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ALONG KY 538 SHOPES CREEK ROAD

DIVISION	"B"
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	04 OF 17

NOTE:
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THIS WORK DOES NOT REPRESENT A BOUNDARY SURVEY.

STATE OF KENTUCKY
DAVID E. GERNANT
20705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

		DATE	BY	REVISION
DESIGNER	ELL			
DRAWN	CRB			
CHECKED	ELL			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: 1" = 20'

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Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

DEMO SHEET ALONG KY 638 MIDLAND TRAIL ROAD AND KY 538 SHOPES CREEK ROAD

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	05 OF 17

Plot Style: 600-BELL-STD.ctb

J:\CANNONSBURG\SHOPES CREEK ROAD AREA\CAD Design\02-691210\W02-06-Sheets.dwg-05 DEMO Plotted Mon, 02 Dec 2024 - 10:29am by lwalker

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THIS WORK DOES NOT REPRESENT A BOUNDARY SURVEY.

STATE OF KENTUCKY
DAVID E. GERNANT
22705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: 1" = 20'

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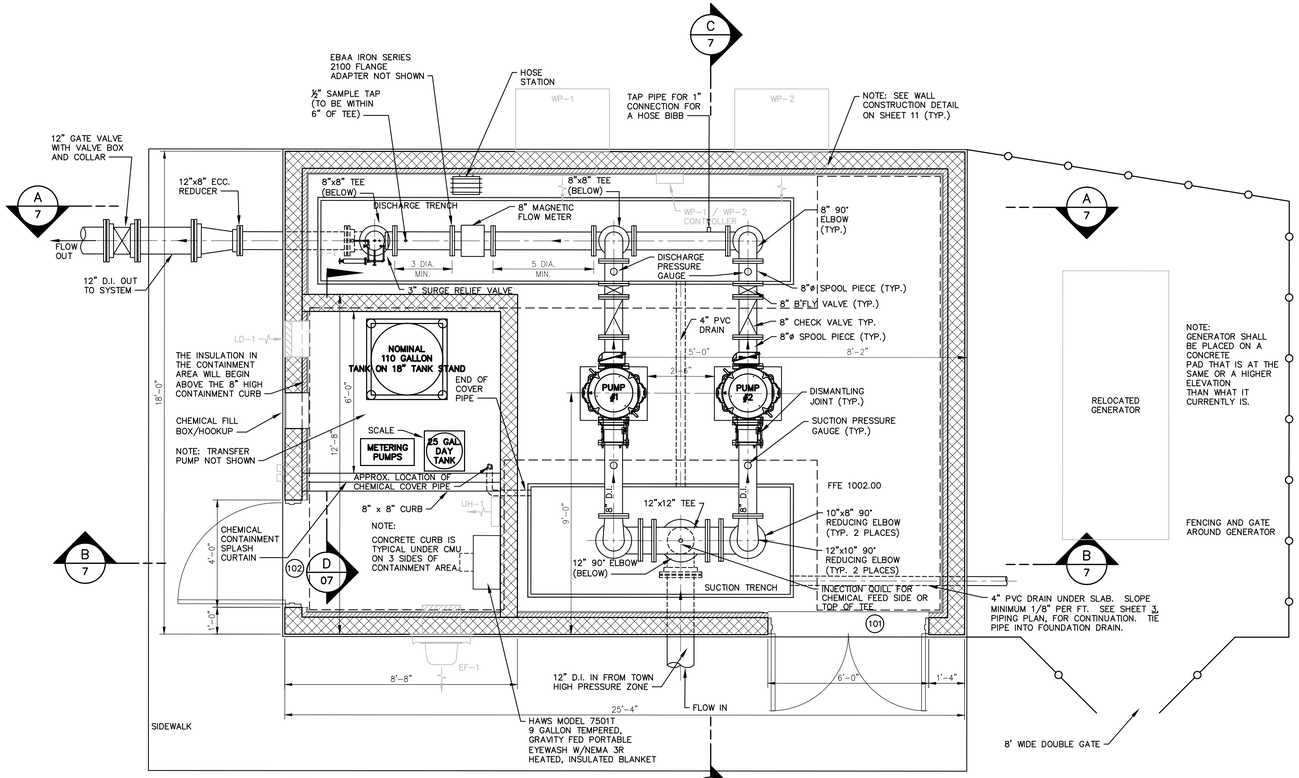
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

PROPOSED PUMP STATION, MASTER METER, BOOSTER CHLORINATOR, AND ZONE METER
KY 638 MIDLAND TRAIL

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	06 OF 17

J:\CANNONSBURG\SHOPES CREEK ROAD AREA\CAD Design\02-691210WS2-06-Sheets.dwg, 06, 12/2/2024 10:59:58 AM, twebber, AutoCAD PDF (General Documentation).pc3
Plot Style: 600-BELL-STD.ctb
Plotted Mon, 02 Dec 2024 - 11:00am by twebber



NOTE:
MINIMUM DISMANTLING JOINT SUCTION PRESSURE IS 150 PSI

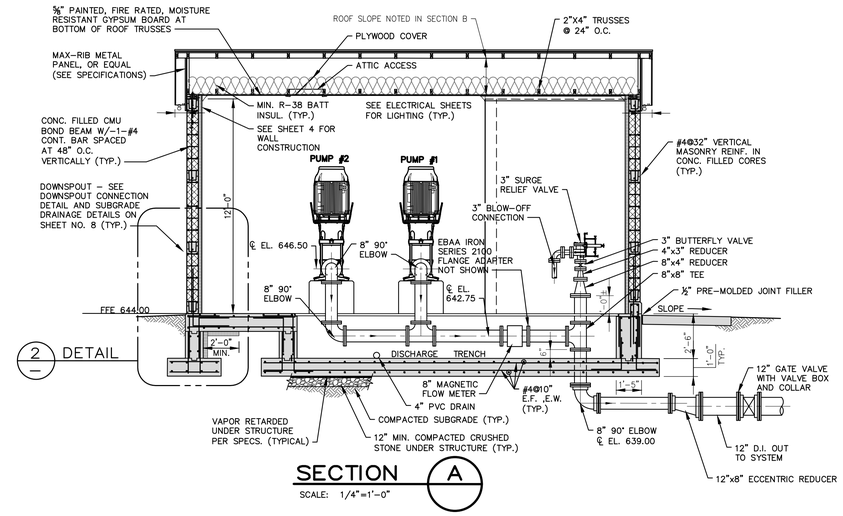
PLAN
SCALE: 3/8"=1'-0"

NOTE:
SEE SHEET D1 FOR AIR RELEASE & GAUGE ASSEMBLIES DETAIL AND DIAPHRAGM SEAL & GAUGE SPECIFICATIONS.

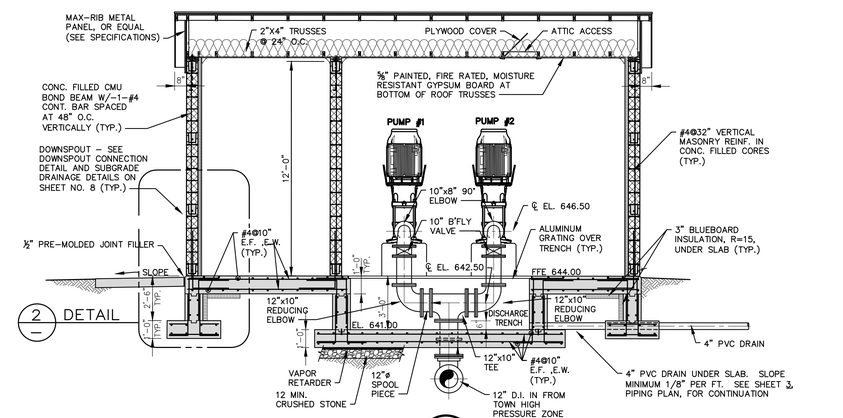
CONTRACTOR TO PROVIDE A FLANGED SPOOL PIECE WITH THE SAME LAYING LENGTH AS THE MAG METER.

MINIMUM FLANGE ADAPTER PRESSURE RATING SHALL BE 250 PSI

NOTE:
DOWNSPOUTS SHALL COME TO WITHIN 3 INCHES OF SPASH BLOCKS



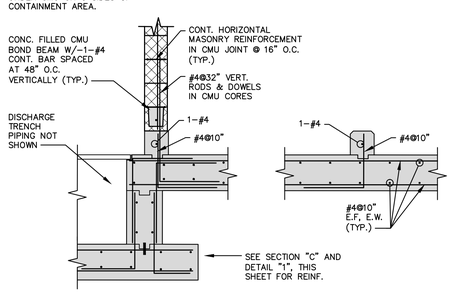
SECTION A
SCALE: 1/4"=1'-0"



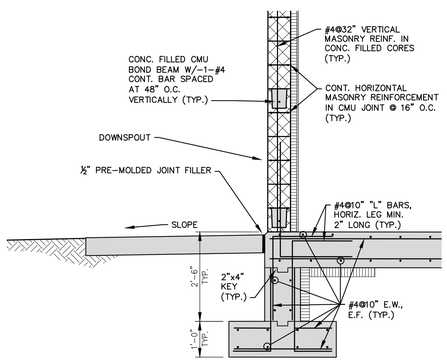
SECTION B
SCALE: 1/4"=1'-0"

NOTE:
FOR TYPICAL REINFORCING SEE DETAILS 1 AND 2, THIS SHEET.

NOTE:
CONCRETE CURB IS TYPICAL UNDER CMU ON 3 SIDES OF CONTAINMENT AREA.



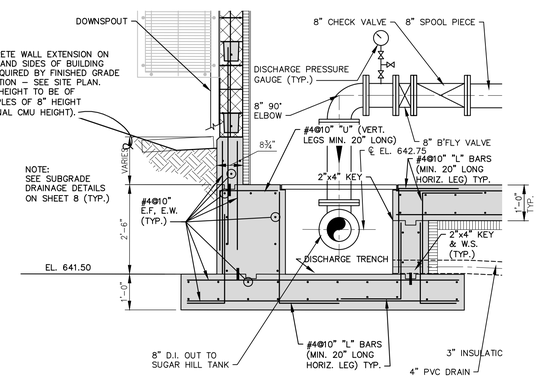
SECTION D
SCALE: 1/2"=1'-0"



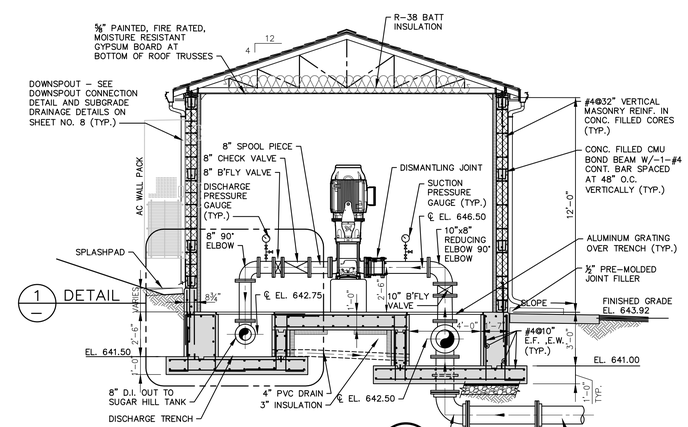
DETAIL 2
SCALE: 1/2"=1'-0"

NOTE:
CONCRETE WALL EXTENSION ON BACK AND SIDES OF BUILDING AS REQUIRED BY FINISHED GRADE ELEVATION – SEE SITE PLAN. WALL HEIGHT TO BE OF MULTIPLES OF 8" HEIGHT (NOMINAL CMU HEIGHT).

NOTE:
SEE SUBGRADE DRAINAGE DETAILS ON SHEET 8 (TYP.)



DETAIL 1
SCALE: 1/2"=1'-0"



SECTION C
SCALE: 1/4"=1'-0"

STATE OF KENTUCKY DAVID BRENNAN 22705 LICENSED PROFESSIONAL ENGINEER
11-12-24

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CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: AS NOTED

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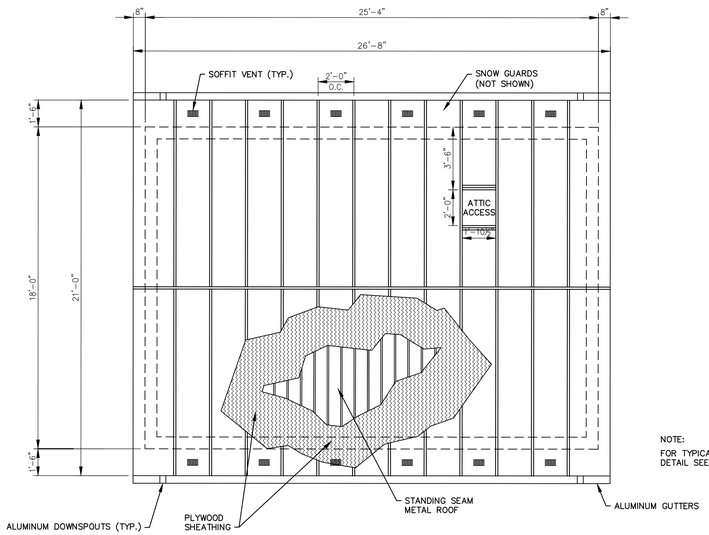
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

SHOPES CREEK
BOOSTER PUMP STATION
PLAN AND SECTIONS

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	07 OF 17



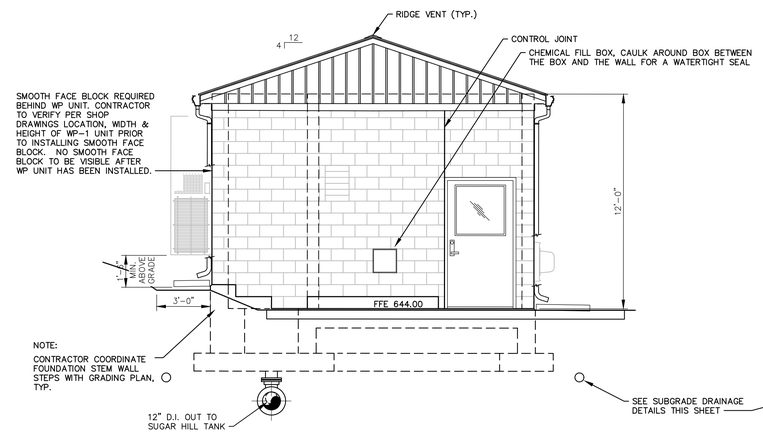
ALUMINUM GUTTER WITH DOWNSPOUTS AT EACH CORNER. COLOR TO MATCH ROOFING COLOR.

NOTE:
THE NUMBER AND SIZE OF THE ROOF VENTS THAT NEED TO BE PROVIDED SHALL BE BASED ON TOTAL ROOF VENT AND RIDGE VENT AREA BEING AT LEAST 0.75 SF OF FREE AREA. THE NUMBER OF SOFFIT VENTS NEEDED SHALL BE BASED ON PROVIDING AT LEAST 0.85 SF OF FREE AREA.

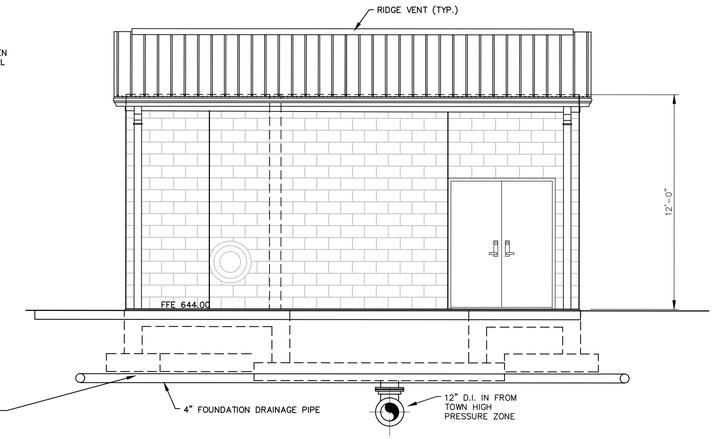
NOTE:
FOR TYPICAL ROOF EDGE DETAIL SEE SHEET NO. 11

ROOF PLAN
SCALE: 1/4"=1'-0"

NOTE:
FOR ROOF CONSTRUCTION NOTES SEE SHEET 12.

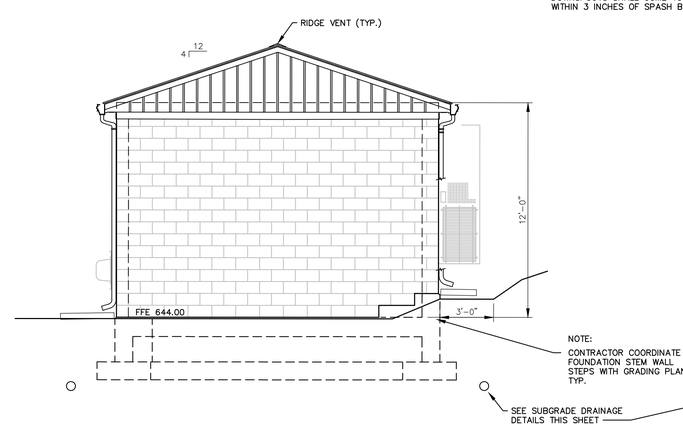


NORTH ELEVATION
SCALE: 1/4"=1'-0"

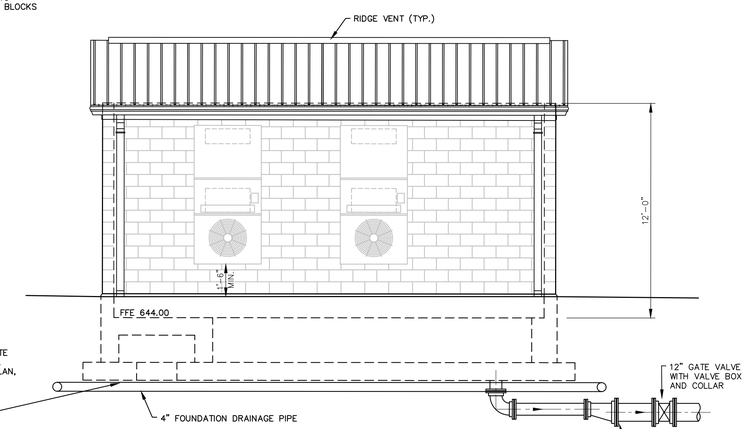


WEST ELEVATION
SCALE: 1/4"=1'-0"

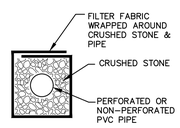
NOTE:
DOWNSPOUTS SHALL COME TO WITHIN 3 INCHES OF SPASH BLOCKS



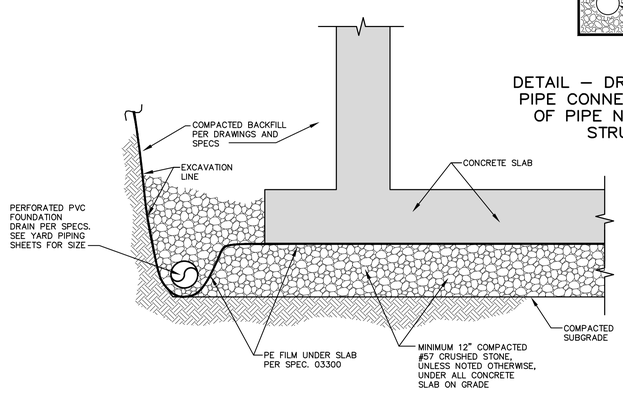
SOUTH ELEVATION
SCALE: 1/4"=1'-0"



EAST ELEVATION
SCALE: 1/4"=1'-0"



DETAIL – DRAINAGE CARRIER PIPE CONNECTING SECTIONS OF PIPE NOT ALONGSIDE STRUCTURES



TYPICAL STRUCTURE SUBGRADE TREATMENT AND DRAINAGE CARRIER PIPE DETAIL
NOT TO SCALE

11-12-24

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GRAPHIC SCALE

SCALE: AS NOTED

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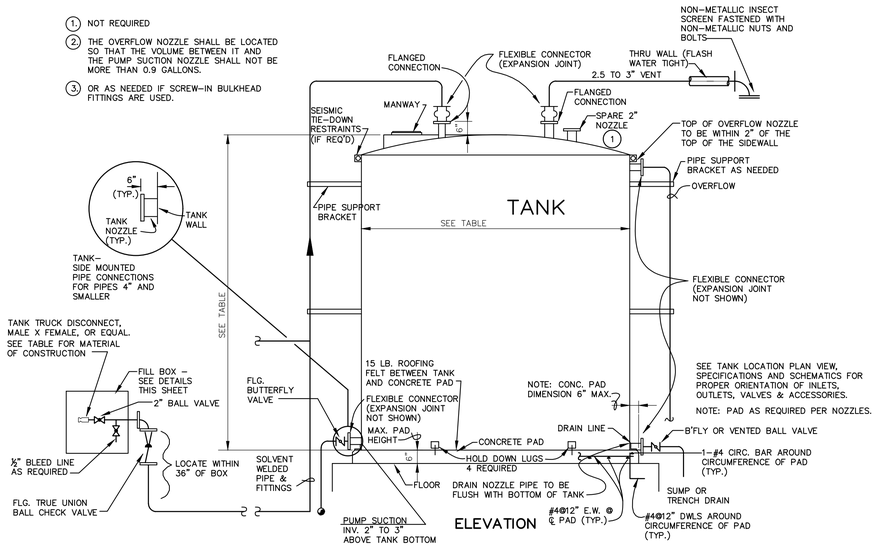
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

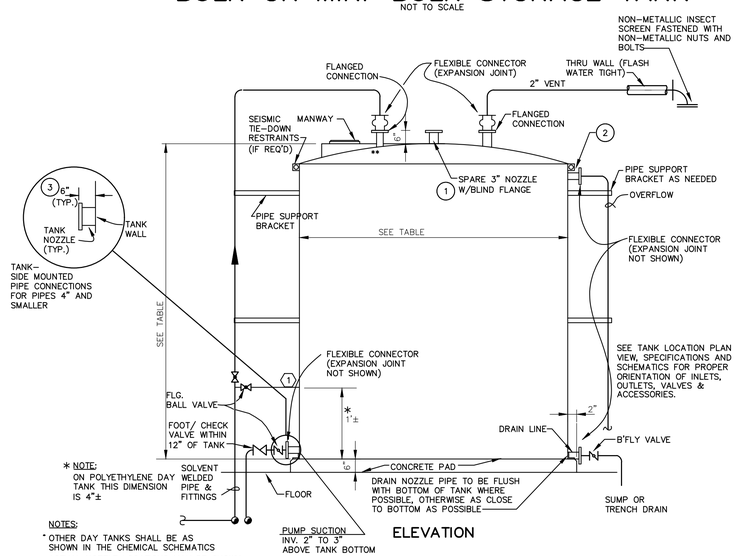
SHOPES CREEK
BOOSTER PUMP STATION
BUILDING ELEVATIONS
AND ROOF PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	08 OF 17



BULK OR MINI-BULK STORAGE TANK

NOT TO SCALE



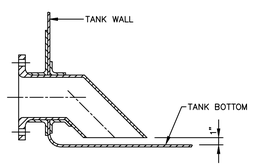
* NOTE:
ON POLYETHYLENE DAY TANK THIS DIMENSION IS 4"±

NOTES:
- OTHER DAY TANKS SHALL BE AS SHOWN IN THE CHEMICAL SCHEMATICS
- ACTUAL NOZZLE LOCATIONS MAY BE SHOWN DIFFERENTLY FOR SPECIFIC CHEMICAL SYSTEMS
- **DAY TANKS MAY BE DOMED TOP OR OPEN TOP WITH BOLTED AND GASKETED COVERS AS NOTED IN THE TANK SCHEDULE.

1 FOR TANKS SMALLER THAN 100 GALLONS THIS NOZZLE IS NOT REQUIRED.

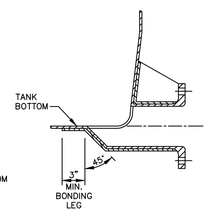
DAY TANKS

NOT TO SCALE



SIPHON DRAIN

NOT TO SCALE



SIDE BOTTOM DRAINS EXTEND BELOW THE TANK BOTTOM TO PROVIDE NEARLY COMPLETE DRAINAGE OF FLAT BOTTOM TANKS

FOUNDATION PAD MUST BE NOTCHED TO ACCOMMODATE FLANGE

SIDE BOTTOM DRAIN

NOT TO SCALE

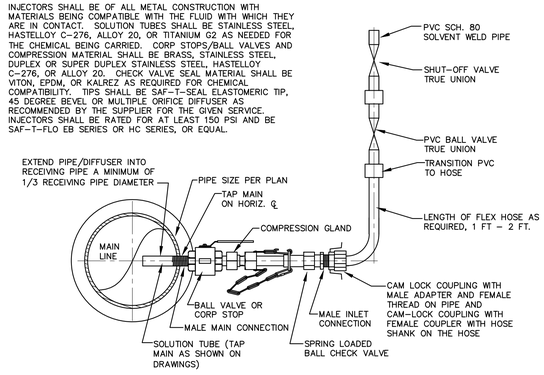
TANK NOTES

- BULK TANK FILL LINES ARE 2" UNLESS NOTED OTHERWISE. DAY TANK FILL LINES ARE AS NOTED IN THE TANK SCHEDULES.
- BULK TANK VENT LINES ARE 2.5 OR 3", DAY TANK VENT LINES ARE 1 SIZE LARGER THAN THEIR FILL LINE OR 2", WHICHEVER IS LARGER.
- OVERFLOW LINES ARE MINIMUM 1 SIZE LARGER THAN THE TANK'S FILL LINE UNLESS NOTED OTHERWISE.
- DRAIN LINES ARE MINIMUM 3" FOR TANKS 2,500 GALLONS OR LARGER, 2" FOR TANKS 300 GALLONS TO 2,499 GALLONS AND 1" FOR TANKS SMALLER THAN 300 GALLONS. TANK DRAIN NOZZLES SHALL HAVE INVERTS FLUSH WITH THE TANK BOTTOM OR WITHIN 1 INCH OF THE BOTTOM AND WHERE THIS IS NOT POSSIBLE THE NOZZLE'S INVERT SHALL BE EQUAL OR LOWER THAN THE PUMP SUCTION NOZZLE, 2" TO 3" ABOVE THE TANK BOTTOM.
- BULK TANK AND DAY TANK SUCTION LINES ARE AS NOTED ON THE TANK SCHEDULES.
- DAY TANK AND BULK TANK VENT LINES FOR THE SAME CHEMICAL SHALL NOT BE TIED TOGETHER. BULK TANK VENT LINES FOR THE SAME CHEMICAL MAY BE TIED TOGETHER.
- TANK STANDS SHALL BE CONSTRUCTED OF PAINTED STEEL, STAINLESS STEEL, FRP OR OTHER COMPATIBLE MATERIAL. STANDS MADE OF CONCRETE OR CONCRETE BLOCK ARE NOT ACCEPTABLE.
- BULK TANK AND MINI-BULK TANK ARE INTERCHANGEABLE UNLESS OTHERWISE NOTED.
- DAY TANKS AND THEIR STANDS SHALL BE LOCATED AT LEAST 6 INCHES FROM THE CONTAINMENT WALLS IF THE TANK BOTTOM IS LESS THAN 6 INCHES BELOW THE TOP OF THE WALL, AND 12 INCHES FROM THE CONTAINMENT WALLS IF THE TANK BOTTOM IS LESS THAN 6 INCHES BELOW THE TOP OF THE WALL. IF THE TANK'S BOTTOM IS LOCATED 6 INCHES OR MORE ABOVE THE CONTAINMENT WALLS THE TANK SHALL BE LOCATED AT LEAST 18 INCHES FROM THE WALLS OR AS FAR AS POSSIBLE.
- CONCRETE PADS UNDER BULK TANKS AND DAY TANKS SHALL BE THE SIZE SHOWN IN THE BULK/SUPPLY TANK AND DAY TANK DETAILS. THEY SHALL NOT BE ENLARGED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER. CONCRETE PADS SHALL HAVE BOXED OUT AREAS FOR NOZZLES AS REQUIRED.
- BULK TANKS SHALL BE LOCATED WHERE SHOWN. FINAL TANK NOZZLE LOCATION SHALL BE PER THE CONTRACTOR UNLESS A SPECIFIC NOZZLE LOCATION IS NOTED IN THE DRAWINGS OR SPECIFICATIONS. SIGHT GAUGES SHALL BE LOCATED SO THE OPERATOR CAN EASILY SEE THE GAUGE FROM THE METERING PUMP AND TANK FILL AREAS. IF THERE IS NO CLEAR VIEW FROM THE TANK FILL AREA, I.E., THROUGH A SOLID WALL WITHOUT A TANK ACCESS DOOR, THEY SHALL BE VISIBLE FROM THE METERING PUMP AREA. NOZZLES SHALL BE NOT LOCATED IN TIGHT CONFINED SPACES.
- TANK VENT LINES SHALL BE LOCATED AT LEAST 10 FEET FROM HVAC AIR INTAKE LOUVERS.

CHEMICAL CONTAINMENT/SPLASH CURTAINS

- A CONTAINMENT/SPLASH CURTAIN SHALL BE PROVIDED BETWEEN THE CHEMICAL EQUIPMENT INCLUDING TANKS, PUMPS, PIPING AND VALVES, ETC., IN THE CHEMICAL CONTAINMENT SUMP AREA AND THE OUTSIDE AREA TO PROTECT PERSONNEL WHILE THEY ARE VIEWING THE EQUIPMENT, INSTRUMENTS, ETC. AND THAT ALLOWS OPERATORS TO MAKE ADJUSTMENT TO THE METERING PUMPS AND VALVES ON THE METERING PUMP SKIDS. THE CURTAINS SHALL ALSO PROVIDE EASY ACCESS TO THE CONTAINMENT AREA SHOULD EQUIPMENT OTHER THAN THE METERING PUMPS NEED TO BE ADJUSTED OR INSPECTED.
- THE CURTAINS SHALL EXTEND FROM A MINIMUM HEIGHT OF 7 FT ABOVE THE FINISHED FLOOR OR THE HEIGHT OF ANY PIPE WITHIN 4 FT OF THE CURTAIN DOWN TO A MINIMUM OF 4 INCHES BELOW THE TOP OF THE CONTAINMENT WALL. THE CURTAIN SHALL DIRECT ANY SPRAYED CHEMICAL TO STAY WITHIN THE CONTAINMENT AREA. THE CURTAIN SHALL BE 3 OR 4 EQUAL SIZE PIECES SPANNING THE WIDTH OF THE ROOM AS SHOWN.
- CURTAINS SHALL BE THE ROLLING AND/OR STRIP CURTAIN TYPE
- CURTAINS SHALL BE MINIMUM 20 MIL CLEAR DOUBLE POLISHED PVC
- CURTAINS SHALL BE NFPA & CFM FIRE RETARDANT WITH FINISHED EDGES AND DOUBLE HEMS
- CURTAIN HARDWARE SHALL BE MINIMUM 16 GAUGE GALVANIZED STEEL OR STAINLESS STEEL
- CURTAINS SHALL BE AKON CURTAINS OR EQUAL.

NOTE:
INJECTORS SHALL BE OF ALL METAL CONSTRUCTION WITH MATERIALS BEING COMPATIBLE WITH THE FLUID WITH WHICH THEY ARE IN CONTACT. SOLUTION TUBES SHALL BE STAINLESS STEEL, HASTELLOY C-276, ALLOY 20, OR TITANIUM G2 AS NEEDED FOR THE CHEMICAL BEING CARRIED. CORP STOPS/BALL VALVES AND COMPRESSION MATERIAL SHALL BE BRASS, STAINLESS STEEL, DUPLEX OR SUPER DUPLEX STAINLESS STEEL, HASTELLOY C-276, OR ALLOY 20. CHECK VALVE SEAL MATERIAL SHALL BE VITON, EPDM, OR KALREZ AS REQUIRED FOR CHEMICAL COMPATIBILITY. TIPS SHALL BE SAF-T-SEAL ELASTOMERIC TIP, 45 DEGREE BEVEL OR MULTIPLE ORIFICE DIFFUSER AS RECOMMENDED BY THE SUPPLIER FOR THE GIVEN SERVICE. INJECTORS SHALL BE RATED FOR AT LEAST 150 PSI AND BE SAF-T-FLO EB SERIES OR HC SERIES, OR EQUAL.



RETRACTABLE INJECTOR 150psi RATED W/CHECK VALVE FOR WATER CONNECTIONS

DETAIL ~ CHEMICAL FEED CONNECTION TO PIPE LINE

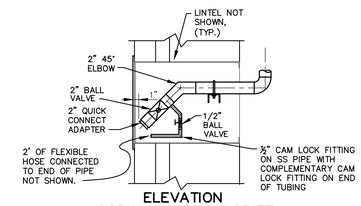
NOT TO SCALE

ACCESS DOOR SPECIFICATIONS

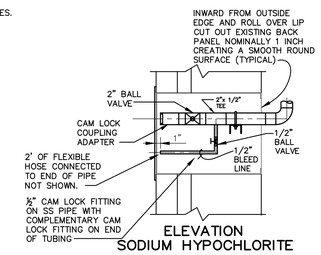
ACCESS DOORS SHALL BE KARP ASSOCIATES, MASPETH, NY, MODEL KRVB, OR EQUAL.

ALL DOORS SHALL BE KEYED THE SAME. PROVIDE THE FOLLOWING:
MINIMUM OF 3 KEYS
SILK SCREENED SIGN PLATES, ONE FOR EACH DOOR, SHALL BE PROVIDED TO READ AS FOLLOW: ONE - SODIUM HYPOCHLORITE

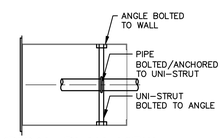
BOXES SHALL BE PROVIDED IN 304L STAINLESS STEEL.



NOTE:
FOR BOXES WITH THE BOX CENTERLINE MORE THAN 42" ABOVE GRADE



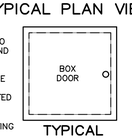
NOTE:
- FOR BOXES WITH THE BOX CENTERLINE LESS THAN 42" ABOVE GRADE



TYPICAL PLAN VIEW

GENERAL NOTE:

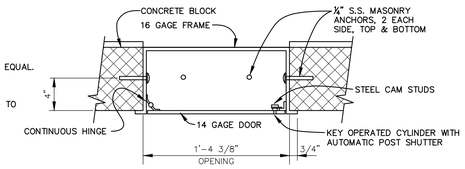
- ½" VALVES TO BE LOCATED SO THEY ARE EASY TO REACH AND OPERATE.
- ALL PIPING AND VALVES INSIDE THE FILL BOXES TO BE 316L STAINLESS STEEL UNLESS NOTED OTHERWISE.
- ½" TUBE WITH CAM LOCK FITTING SHALL BE EASILY REACHED INSIDE BOX.



TYPICAL FRONT VIEW

CHEMICAL FILL BOXES (A.K.A.) TANK TRUCK CONNECTION ACCESS DOOR

NOT TO SCALE



TANK TRUCK CONNECTION ACCESS DOOR DETAIL

NOT TO SCALE

KAMLOK DUST CAP

KAMLOK ADAPTER

TANK TRUCK CONNECTION ACCESS DOOR

GENERAL NOTES

- METERING PUMPS, SUCTION AND DISCHARGE PIPING, VALVES, CALIBRATION COLUMNS, STRAINERS, SUPPORT STRUCTURE, ETC., AS SHOWN ON SHEET 10 SHALL BE FURNISHED AS A PRE-PIPE, PRE-ASSEMBLED PACKAGE ONLY. INSTALLATION, INCLUDING CONNECTION OF SUCTION AND DISCHARGE PIPING, FLUSH LINES AND ELECTRICAL AND CONTROL WIRING, SHALL BE PROVIDED IN THE FIELD.
- THE SUPPORT STRUCTURE SHALL CONSIST OF A TABLE, UNI-STRUT GRID OR SIMILAR SETUP THAT HOLDS AND SUPPORTS ALL ITEMS OF THE PACKAGE CONSTRUCTED OF MATERIAL AS SPECIFIED IN 11242. THE METERING PUMPS SHALL BE MOUNTED AS SPECIFIED ON THE DRAWINGS OR AT THE TOP OF THE CONTAINMENT WALL, WHICHEVER IS GREATER.
- ALL VALVES, STRAINERS, ETC., SHALL BE TRUE UNION.
- ALL RIGID PIPING SHALL BE SOCKET WELD OR FLANGED AS INDICATED ON THE SCHEDULE. ALSO SEE GENERAL PIPING NOTES ON SHEET 01.
- ALL PIPE CONNECTIONS TO TANKS SHALL BE FLEXIBLE VIA AN EXPANSION JOINT OR SIMILAR DEVICE AND BE SUPPORTED SO THAT NO LOAD IS TRANSFERRED TO THE TANKS. EXPANSION JOINTS SHALL BE AS NOTED ON SHEET 01, GENERAL PIPING NOTES. WHERE TANK ISOLATION VALVES ARE SHOWN IN THE PIPELINE THE VALVES SHALL BE PLACED BETWEEN THE EXPANSION JOINT AND THE TANK.
- ALL PIPE SUPPORTS SHALL BE IN ACCORDANCE WITH SECTIONS 15140 OF THE SPECIFICATIONS. ALL PIPE SUPPORTS IN THE CHEMICAL BUILDING SHALL BE STAINLESS STEEL.
- ALL MANUAL VALVES 2" AND SMALLER SHALL BE PVC TRUE UNION BALL TYPE UNLESS OTHERWISE NOTED. ALL MANUAL VALVES 2½" OR LARGER SHALL BE BUTTERFLY VALVES UNLESS OTHERWISE NOTED. BALL VALVES ON ALL SODIUM HYPOCHLORITE LINES SHALL BE VENTED BALL VALVES.
- ALL EQUIPMENT, VALVES, ETC., SHALL BE ABLE TO BE EASILY REMOVED FROM THE PIPE SYSTEM BY THE GENEROUS USE OF UNIONS OR SIMILAR CONNECTIONS.
- SEE THE EQUIPMENT SCHEDULES/TABLES FOR PIPE, TANK, ETC., SIZING.
- THE TERM SUMP REFERS TO A SYSTEM'S SECONDARY CONTAINMENT AREA UNLESS OTHERWISE NOTED.
- DAY TANKS, TRANSFER PUMPS AND METERING PUMPS ARE SHOWN IN APPROXIMATE LOCATIONS. THEY MAY BE MOVED SLIGHTLY TO ACCOMMODATE PIPING OR TO PROVIDE ACCESS TO OTHER EQUIPMENT, ETC. DAY TANKS, TRANSFER PUMPS AND METERING PUMPS SHALL BE LOCATED SO THAT THEIR CONTENTS WILL DRAIN INTO THE CONTAINMENT SUMP, FROM ALL SIDES, SHOULD A LEAK DEVELOP.
- CHEMICAL TRANSFER PUMPS SHALL BE LOCATED ON STANDS OR SHELVES CONSTRUCTED OF PAINTED STEEL, STAINLESS STEEL, FRP OR PLASTIC SHEETS, BARS, STRUTS, PLATES, ETC. CONCRETE PADS OR STANDS UNDER TRANSFER PUMPS SHALL BE THE SIZE SHOWN ON THE DRAWINGS.
- BULK CHEMICAL TANK FILL BOXES SHALL BE LOCATED SO THAT THE CENTER OF THE BOX IS APPROXIMATELY 30 INCHES TO 36 INCHES ABOVE THE SURROUNDING GRADE OR THE BOTTOM OF THE BOX IS NO MORE THAN 4 INCHES ABOVE THE TOP OF THE CHEMICAL CONTAINMENT WALL WHEN THE CONTAINMENT WALLS PREVENT THE BOX FROM BEING MOUNTED AS NOTED ABOVE.

LEGEND

BST	- BULK STORAGE TANK		- 3 WAY VALVE
DT	- DAY TANK	HL/S	- HIGH LEVEL ALARM/SHUT OFF
TP	- TRANSFER PUMP	HLL	- HIGH LIQUID LEVEL
CC	- CALIBRATION COLUMN	DR	- DRAIN
	- GATE VALVE	OF	- OVERFLOW
	BUTTERFLY VALVE		- PRESSURE GAUGE W/ISOLATOR
	- DIAPHRAGM VALVE	PS	- PRESSURE SWITCH
	- BALL VALVE	LL	- LOW LIQUID LEVEL
	- CHECK VALVE	SP	- SLURRY PUMP
	- ELECTRICALLY OPERATED BALL VALVE	PI	- PRESSURE INDICATOR
	- BALL VALVE W/EXTENSION STEM	PSH	- PRESSURE SWITCH-HIGH
	- PRESSURE RELIEF VALVE	PSL	- PRESSURE SWITCH-LOW
	- BACK PRESSURE VALVE	LSL	- LEVEL SWITCH-LOW
	- VACUUM BREAK/ANTI SIPHON VALVE	LSH	- LEVEL SWITCH-HIGH
	- PRESSURE RELIEF VALVE	FI	- FLOW INDICATOR
	- FLEXIBLE CONNECTION	Y	- CHEMICAL DRAIN
	- UNION		- BACK-PRESSURE REGULATING VALVE
	- STRAINER		- ROTAMETER
	- OVERFLOW VALVE		- PULSATION DAMPENER
S	- SOLENOID VALVE		- METERING PUMP
	- ISOLATION DIAPHRAGM	DMP	- DOUBLE HEADED METERING PUMP
F	- FILL LINE W/LOCK ACCESS		- - - - ALL EQUIPMENT CONTAINED WITHIN IS TO BE SUPPLIED AS PART OF THE PACKAGE AS SHOWN AND SPECIFIED
V	- VENT LINE		
SB	- SIPHON BREAKER		
PB	- PUSH BUTTON		
LLS	- LIQUID LEVEL SENSOR		
LMS	- LEVEL MONITORING SYSTEM		

STATE OF KENTUCKY DAVID E. GERNERT 20705 LICENSED PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	LGL			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

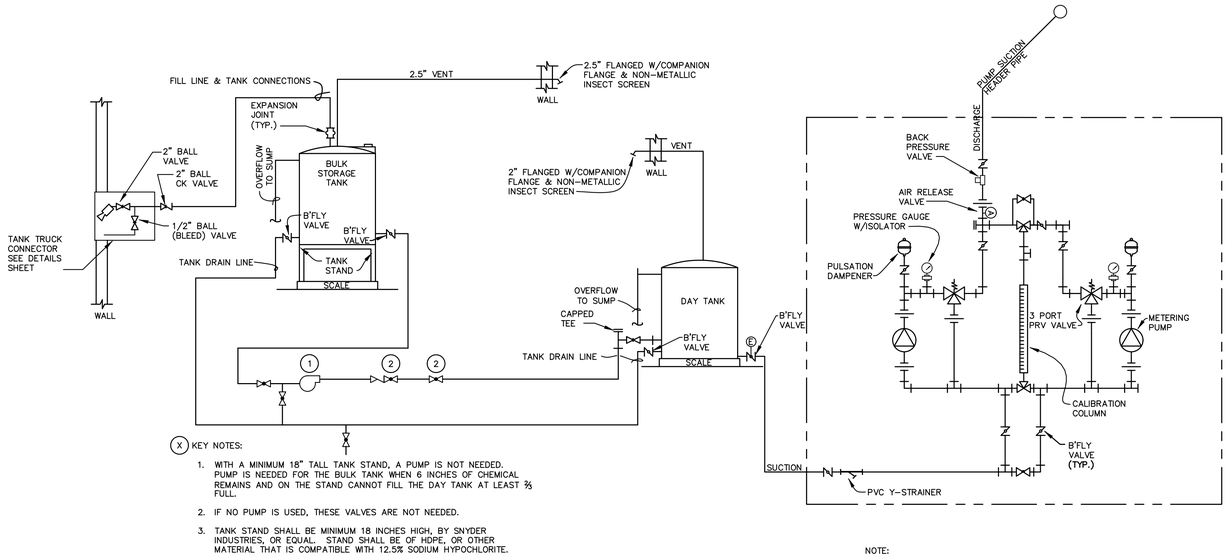
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

CHEMICAL FEED DETAILS

DIVISION	-
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	09 OF 17



X KEY NOTES:

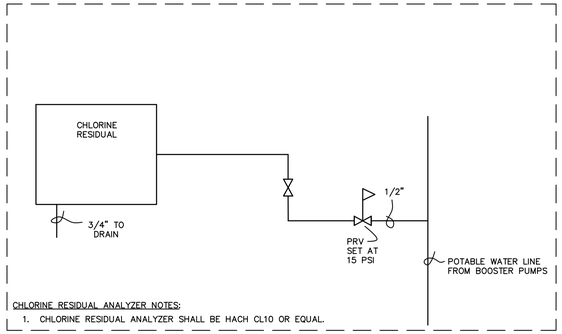
1. WITH A MINIMUM 18" TALL TANK STAND, A PUMP IS NOT NEEDED. PUMP IS NEEDED FOR THE BULK TANK WHEN 6 INCHES OF CHEMICAL REMAINS AND ON THE STAND CANNOT FILL THE DAY TANK AT LEAST ⅔ FULL.
2. IF NO PUMP IS USED, THESE VALVES ARE NOT NEEDED.
3. TANK STAND SHALL BE MINIMUM 18 INCHES HIGH, BY SNYDER INDUSTRIES, OR EQUAL. STAND SHALL BE OF HDPE, OR OTHER MATERIAL THAT IS COMPATIBLE WITH 12.5% SODIUM HYPOCHLORITE.

12.5% SODIUM HYPOCHLORITE FEED SYSTEM

NO SCALE

NOTE:

TRUE UNION DIAPHRAGM VALVES OR VENTED BALL VALVES, MAY BE USED IN PLACE OF BUTTERFLY VALVES PIPES SHALL SLOPE UPWARDS TOWARDS THE TANKS FROM THE TRANSFER PUMP THE HIGH POINT OF EACH FEED LINE SHALL HAVE AN AIR RELEASE VALVE



CHLORINE RESIDUAL ANALYZER NOTES:

1. CHLORINE RESIDUAL ANALYZER SHALL BE HACH CL10 OR EQUAL.

BOOSTER CHLORINATION SAMPLE PIPING SCHEMATIC

METERING PUMPS

NO.	FEED SYSTEM PROVIDED BY	CHEMICAL SYSTEM	NOMINAL METERING PUMP OR FEEDER SUCTION / DISCHARGE LINE SIZE	MINIMUM PUMP DESIGN PRESSURE PSIG	NOMINAL FEED RATE GPH (mg/l)**	MINIMUM PUMP RATE SUPPLIED GPH**	MINIMUM NOMINAL TURNDOWN RATIO	NUMBER OF PUMPS SUPPLIED / INSTALLED	METERING PUMP OR EQUAL TO BE SUPPLIED	COMMENTS[1]	CHEMICAL SYSTEM
1	Contractor	12.5% Sodium Hypochlorite	3/8" /3/8"	45	"0.8 (2.0)	1.000	1000 : 1 .00	2 / 2	Watson-Marlow Qdos	The minimum pump output shall be no more than 0.004 gph	12.5% Sodium Hypochlorite

** The nominal feed rate of 2.0 mg/l at 1000 gpm (1.44 MGD) is equal to 0.7619 gph (18.29 GPD) and the nominal feed rate of 2.0 mg/l at 100 gpm is equal to 0.008 gph 1.829 GPD). The feed pump shall be able to handle these flows and everything in between.

DAY/FEED TANKS

NO.	TANK PROVIDED BY *	CHEMICAL SYSTEM	DAY TANK MINIMUM NOMINAL CAPACITY AND SIZE	DAY TANK MINIMUM USABLE [2] VOLUME	DAY TANK MATERIAL OF CONSTRUCTION	DAY TANK LEVEL MEASUREMENT TYPE[3]	I & C METERING PROVIDED BY	SIGHT GAUGE DISPLAY INCREMENTS (gal)	MINIMUM SCALE CAPACITY (lbs)	COMMENTS	CHEMICAL SYSTEM
1	Contractor	12.5% Sodium Hypochlorite	25 gallons (14" dia x 40" OTH)	19 gallons	HDPE	21-3/4" x 15-3/4" Scale	Contractor	N/A	0.2	Minimum scale capacity is 400 lbs	12.5% Sodium Hypochlorite
2											

[1] SS = Straight Side Height, OTH = Overall Tank Height
[2] The minimum usable volume is the volume in the straight side area of the tank minus volume lost to pump suction and overflow nozzle placement.
[3] Sight gauge consisting of clear tube & valves or semi-transparent tank.
[4] The scale size may increase if a day tank with a larger diameter is provided. The maximum tank diameter for this scale size (Force Flow WR400) is 19 inches.

*CHEMICAL CHARACTERISTICS

CHEMICAL*	NOMINAL SOLUTION STRENGTH PERCENT	SPECIFIC GRAVITY	VISCOSITY in CENTIPOISE @ 68 DEGREES FAHRENHEIT	pH	FREEZING POINT - DEGREES FAHRENHEIT
Coagulant - DelPac	100	1.23	*	2 - 3.5	-26.0
Coagulant - 1750 ION	100	1.3 - 1.35	*	3.0 - 4.0	22
Coagulant - Aluminum Sulfate (Alum)	49	1.335	23.00	2.4	2
Sodium Hydroxide	25	1.26	7.50	14.0	4.0
[1]Sodium Hypochlorite - 12.5%	12.5	1.27	*	13.0	-11.0
Carbon Slurry	17	1	*	6.75-7.25	32.0
Sodium Permanganate	20 - 40	1.16	*	5 - 8	24.8
Potassium Permanganate	3	1.05	1.00		
Hydrofluosilicic Acid	22 - 25	1.23	*	1.2	-4.0
Citric Acid	50	1.24	*	2.0	23.0
[2] Phosphoric Acid	75	1.69	2.4 - 9.4	1.08	0.50
Sodium Bisulfite	20 - 41	1.2 - 1.4	*	4.0 - 5.5	39.00
[3]Hydrogen Peroxide - 7.5%	35	1.13	*	2.0 - 3.7	6 @ 20% to -27 @ 35%
PolyPhosphate		1.25		5.5 - 7 @ 1%	

* Data provided where available. Not all chemicals listed may be used in the project.
[1] Sodium Hypochlorite will be purchased as a nominal 12.5% solution and be diluted to roughly 6.25% solution on site. Data is for 12.5% unless noted otherwise.
[2] The pH of phosphoric acid is based on a 1 molar solution.
[3] Hydrogen Peroxide will be purchased in 20% or 30% solution and diluted down to <8% on site. Data is for 35% unless otherwise noted.

SUPPLY or BULK/MINI-BULK TANKS

NO.	TANK PROVIDED BY	CHEMICAL SYSTEM OR TANK CONTENTS	STORAGE	BULK TANK MINIMUM NOMINAL CAPACITY AND SIZE	BULK TANK MAXIMUM USABLE VOLUME[1,2]	NUMBER OF TANKS	BULK TANK LEVEL MEASUREMENT TYPE	BULK TANK MATERIAL OF CONSTRUCTION	I & C METERING PROVIDED BY	BULK TANK FILL LINE SIZE & MATERIAL OF CONSTRUCTION	BULK TANK FILL CONNECTION SIZE & MATERIAL OF CONSTRUCTION	MINIMUM PIPE SIZE & MATERIAL BULK TANK TO TRANSFER PUMP	MINIMUM PIPE SIZE & MATERIAL TRANSFER PUMP TO DAY TANK	COMMENTS	CHEMICAL SYSTEM OR TANK CONTENTS
1	Contracor	12.5% Sodium Hypochlorite	Mini-Bulk	110 gallons (32" dia x 41"H)	100	1	36" x 36" Scale	HDPE	Contractor	2" CPVC	2" - Male Camlock by Female Thread - Glass Filled Polypropylene	3/4" PVC	3/4" PVC	Chemical will flow by gravity, no transfer pump but the tank will sit on a minimum 18 inch high tank stand	12.5% Sodium Hypochlorite

[1] The usable tank volume should be between 80 and 100 gallons.
[2] The minimum usable volume is the volume in the straight side area of the tank minus volume lost to pump suction and overflow nozzle placement.

STATE OF KENTUCKY DAVID E. GERNERT 20705 LICENSED PROFESSIONAL ENGINEER
11-12-24

		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	LGL			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

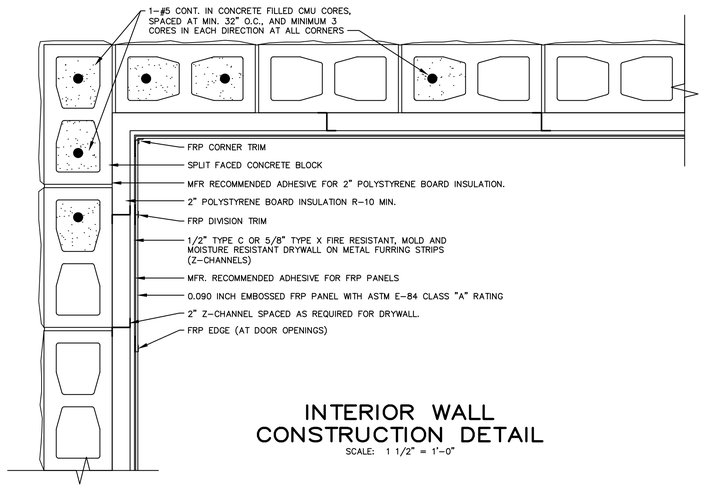
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

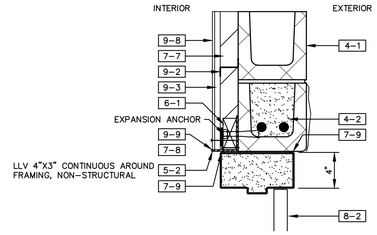
CHEMICAL FEED SCHEMATICS AND CHEMICAL EQUIPMENT SCHEDULES

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	10 OF 17



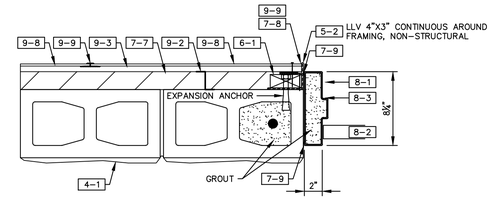
INTERIOR WALL CONSTRUCTION DETAIL

SCALE: 1 1/2" = 1'–0"



DOOR HEAD – EXTERIOR

SCALE: 1 1/2" = 1'–0"



DOOR JAMB – EXTERIOR

SCALE: 1 1/2" = 1'–0"

KEYNOTE MATERIAL LEGEND

MASONRY 04000

4–1	CMU – 04200
4–2	BOND BEAM – SEE DETAIL, SHT. 12 – 04200

METALS 05000

5–2	STEEL ANGLE – SEE STRUCTURAL DWGS – 05120

WOOD AND PLASTICS 06000

6–1	PRESSURE TREATED WOOD BLOCKING – 06105

THERMAL AND MOISTURE PROTECTION 07000

7–7	EXTRUDED POLYSTYRENE – 07210
7–8	JOINT SEALANT – 07920
7–9	JOINT SEALANT W/ BACKER ROD – 07920

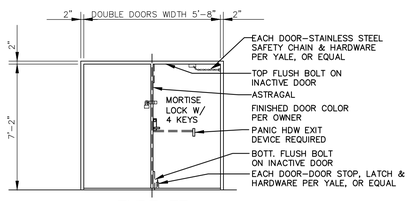
DOORS AND WINDOWS 08000

8–1	HOLLOW METAL FRAME – 08111
8–2	HOLLOW METAL DOOR – 08111
8–3	JAMB ANCHORS (3 PER JAMB) – 08111

FINISHES 09000

9–2	NON–STRUCTURAL 16GA METAL Z FURRING – 09221
9–3	GYPSUM BOARD – 09290
9–8	FRP WALL PANELS – 09770
9–9	FRP PANEL MOLDING AND TRIM – 09770

ACCEPTABLE MFR. PRODUCTS DESIGNATING THE QUALITY, TYPE, FUNCTION AND ETC..	
SIZE	3'–0" x 7'–2"
SINGLE DOOR AND FRAME	SEE SPECIFICATION SECTION 08220 FOR THE FRP DOOR AND FRAME REQUIREMENTS.
ENTRANCE LOCKSET	YALE – MORTISE – MONROE MOSL – (F04) – SL8807FL – US 32D W/ 4 KEYS & ARE KEYED PER OWNERS REQUEST
HINGE BUTTS	HAGER – MORTISE – BB1199 – 4 1/2"x 4 1/2" – US32D
THRESHOLD	NAT. GUARD PROD.–8424 – ALUMINUM
CRASH STOP	IVES – 115 – 25 1/2" LGTH. THRU BOLT FASTENING
FLUSH BOLT (TOP AND BOTTOM)	IVES – 458 – US26D
RAIN DRIP	NAT. GUARD PROD.–101AV – ANO. ALUM.
WEATHER–STRIPPING	NAT. GUARD PROD.–110NA – ANO. ALUM. (HEAD & JAMB)
SWEEP	NAT. GUARD PROD.–600 ANO. ALUM. & NYLON
MORTISE LOCK EXIT DEVICE	DETEX SERIES 30 – CYLINDER DOGGING



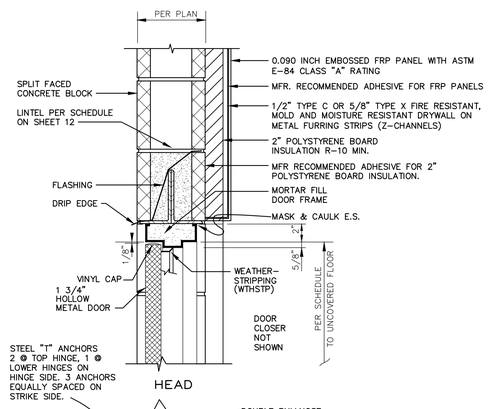
TYPE FF DOUBLE DOORS (PR. DR.) W/FRAME ELEVATION

DOOR, FRAME AND HARDWARE SPECIFICATIONS:
DOOR SHALL BE HOLLOW METAL RESISTANCE TO HIGH IMPACT, HIGH FREQUENCY USE, CORROSION AND HEAT TRANSMISSION ARE THE GOVERNING FACTORS REQUIRING THE DOOR TO MEET DURABILITY STANDARDS OF THE STEEL DOOR INSTITUTE (SDI) STANDARD DATA SERIES ANSI/SDI A250.8 CLASSIFICATION TYPE III, MAXIMUM DUTY OR NAAMM STANDARD CHEM–1–74. DOOR SHALL HAVE PASSED AND SHALL MEET THE REQUIREMENTS OF ANSI STANDARD A250.4, TWIST TEST AND I MILLION CYCLE SWING TEST.

ACCEPTABLE MFR. PRODUCTS DESIGNATING THE QUALITY, TYPE, FUNCTION AND ETC..	
SIZE	5'–8" x 7'–2" RHR AND LHR ACTIVE
DOUBLE DOOR AND FRAME	CECO 1 3/4" IMPERIAL MAXIM (IU), 14 GAUGE HOT DIP GALV. STL. ASTM A924 AND A653, DOOR WITH MERCURY OR WEATHER KERF FRAME DOOR AND FRAME TO BE U FACTOR 0.091 R FACTOR; U FACTOR DOOR 0.38, R FACTOR DOOR 2.63 PER NFRC 102–2014 AND DEFINED BY NFRC 102–2014, ASTM C1199 AND ASTM C1363
ENTRANCE LOCKSET	YALE – MORTISE – MONROE MOSL – (F04) – SL8807FL – US 32D W/ 4 KEYS & ARE KEYED PER OWNERS REQUEST
HINGE BUTTS	HAGER – MORTISE – BB1199 – 4 1/2"x 4 1/2" – US32D
THRESHOLD	NAT. GUARD PROD.–8424 – ALUMINUM
CRASH STOP	IVES – 115 – 25 1/2" LGTH. THRU BOLT FASTENING
FLUSH BOLT (TOP AND BOTTOM)	IVES – 458 – US26D
STEEL ASTRAGAL	FURNISHED BY DOOR MANUFACTURER
RAIN DRIP	NAT. GUARD PROD.–101AV – ANO. ALUM.
WEATHER–STRIPPING	NAT. GUARD PROD.–110NA – ANO. ALUM. (HEAD & JAMB)
SWEEP	NAT. GUARD PROD.–600 ANO. ALUM. & NYLON
MORTISE LOCK EXIT DEVICE	DETEX SERIES 30 – CYLINDER DOGGING

BOOSTER STATION SURFACE DETAIL

NOT TO SCALE

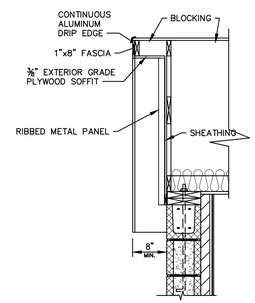


HOLLOW METAL DOOR

SCALE: 1 1/2"=1'–0"

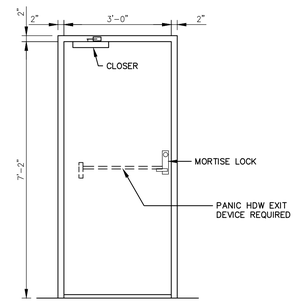
EXTERIOR DOOR SETTING IN 8" CMU WALLS

SCALE: 1 1/2"=1'–0"



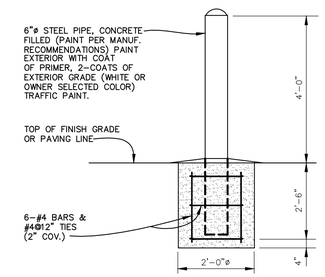
GABLE EDGE DETAIL

SCALE: 3/4" = 1'–0"



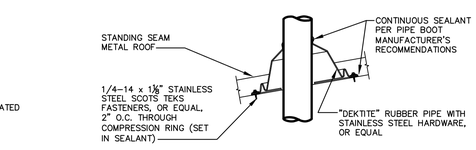
TYPE F SINGLE DOOR WITH FRAME

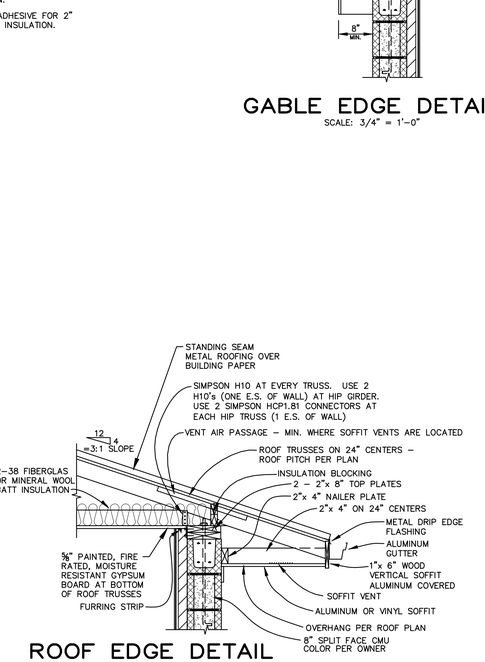
NOT TO SCALE



GUARD POST DETAIL

SCALE: 3/4"=1'–0"
(SEE PLAN VIEW)

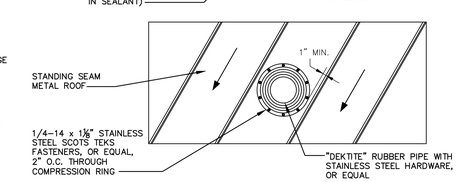




ROOF EDGE DETAIL

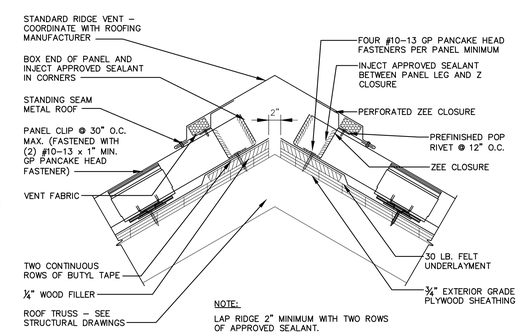
SCALE: 3/4"=1'–0"

NOTE:
EXTERIOR WOOD FASCIA, VERTICAL SOFFITS, ETC. TO BE ALUMINUM OR VINYL CLAD



DETAIL – VENT PIPE

SCALE: NONE



NOTE:
LAP RIDGE 2" MINIMUM WITH TWO ROWS OF APPROVED SEALANT.

DETAIL – RIDGE VENT

SCALE: NONE

STATE OF KENTUCKY DAVID E. GERNERT 20705 LICENSED PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	LGL			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

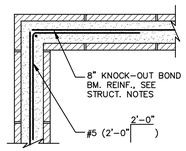
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278–5412
Hopkinsville, KY (270) 886–5466
Somerset, KY (606) 485–4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

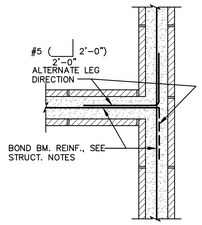
BOOSTER PUMP STATION
MISCELLANEOUS DETAILS

DIVISION	–
CONTRACT NO.	691–21–01
DATE	SEPTEMBER 2021
SHEET NO.	11 OF 17



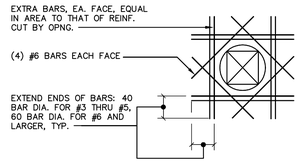
TYPICAL DETAIL @ BOND BEAM CORNERS

NOT TO SCALE



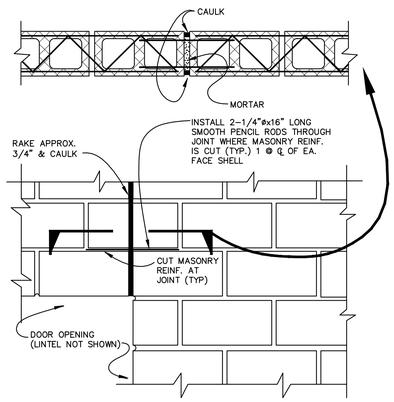
TYPICAL DETAIL @ BOND BEAM INTERSECTION, U.N.O.

NOT TO SCALE



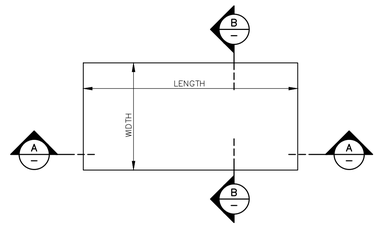
ADDITIONAL REINFORCING FOR SLAB/WALL OPENINGS

NOT TO SCALE



CONTROL JOINT AT DOORS

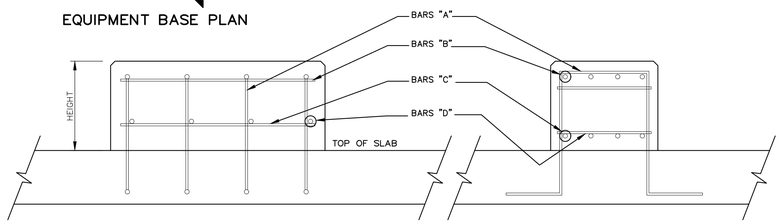
NOT TO SCALE



EQUIPMENT BASE PLAN

NOTES:

1. BARS "A" SHALL MATCH THE BAR SIZE AND SPACING OF THE SLAB REINFORCEMENT RUNNING IN THE "WIDTH" DIRECTION, WHILE RESPECTING THE COVER REQUIREMENTS OF THE EQUIPMENT BASE. IF THIS QUANTITY OF BARS IS ODD, ROUND UP TO THE NEAREST EVEN NUMBER AND EVENLY DISTRIBUTE.
2. BARS "B" AND "C" SHALL BE QUANTIFIED AS "#5@10"", ROUNDING UP TO NEAREST EVEN NUMBER. IF "HEIGHT" IS LESS THAN 14", OMIT BARS "C".
3. BARS "D" SHALL MATCH THE SIZE AND SPACING OF BARS "A". IF "HEIGHT" IS LESS THAN 14", OMIT BARS "D".
4. EQUIPMENT BASE SHALL BE SAME CONCRETE MIX AS THE SLAB, UNLESS NOTED OTHERWISE. PROVIDE CHAMFER AT CORNERS U.N.O. PROVIDE 2" CONCRETE COVER OVER REINFORCEMENT.
5. ADJUST BAR SPACING TO ACCOMMODATE EQUIPMENT & PIPING. BARS SHALL BE ADJUSTED SYMMETRICALLY TO ALLOW EQUIPMENT AND PIPING TO BE CENTERED.
6. DIMENSIONS OF EQUIPMENT BASE ARE PER PLAN OR EQUIPMENT MANUFACTURER.



SECTION A

SECTION B

TYPICAL EQUIPMENT BASE REINFORCING

GENERAL NOTES FOR ROOF CONSTRUCTION:

1. THE ROOF SHALL BE THE GABLE ROOF TYPE. TRUSSES SHALL BE PITCHED TYPE WITH 4:1 SLOPE (3" IN 12"). RAFTERS SHALL BE NOTCHED AT THE NAILER PLATE AND TOENAILED WITH TWO 10d NAILS EACH SIDE
2. PLYWOOD SHEATHING FOR ROOF SHALL BE EXTERIOR GRADE –APA RATED FOUR BY EIGHT FOOT SHEETS, 5/8 INCH THICK. PLY CLIPS SHALL BE PROVIDED BETWEEN EACH RAFTER. PROVIDE PREFORMED ALUMINUM BLOCKING FOR ALL EXPOSED ENDS OR EDGES. NAIL WITH 6D COMMON NAILS SPACED 6 INCHES APART ON THE EDGES AND 12 INCHES APART FOR INTERMEDIATE NAILING.
3. PROVIDE PARTIAL HEIGHT BLOCKING AT NAILER PLATE BETWEEN CEILING JOISTS TO RETAIN INSULATION. INSULATION SHALL BE R–38.
4. CONTINUOUS 0.025 INCH GAUGE WHITE ALUMINUM 4 INCH GUTTERING SHALL BE PROVIDED ON THE BUILDING WITH THE NUMBER OF DOWNSPOUTS AS SHOWN. GUTTERS SHALL BE HUNG USING BRACKET TYPE HANGERS. DOWNSPOUTS SHALL BE CORRUGATED RECTANGULAR TYPE MOUNTED WITH BRACKETS. GUTTER HANGERS SHALL BE 3 FT. O.C.
5. SNOW GUARDS SHALL BE PROVIDED BETWEEN EACH METAL RIDGE.

TRUSS NOTES:

1. PREFABRICATED ROOF TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE NATIONAL "DESIGN SPECIFICATIONS FOR STRESS–GRADE LUMBER AND ITS FASTENINGS" AS RECOMMENDED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.
2. DESIGN TRUSS LOADINGS:
   ROOF TRUSSES: TOP CHORD DEAD LOAD: 10 PSF
   TOP CHORD LIVE LOAD: 20 PSF (SNOW)
   BOTTOM CHORD DEAD LOAD: 10 PSF
   WIND LOAD: 70 MPH
3. TRUSS MANUFACTURER SHALL SUBMIT ERECTION PLAN AND SHOP DRAWINGS BEARING THE SEAL OF AN ENGINEER REGISTERED IN THE STATE OF KENTUCKY CONFORMING TO THE DESIGN CRITERIA SPECIFIED HEREIN FOR APPROVAL AND PRIOR TO FABRICATION. SUBMITTED DATA TO CONTAIN:
   –DESIGN LOADINGS AND ALLOWABLE STRESS INCREASES EMPLOYED
   –CALCULATED TRUSS MEMBER STRESSES
   –RATED LOAD CAPACITY OF THE TRUSS MEMBER CONNECTORS
   –SIZE, SPECIES AND STRESS–GRADE OF LUMBER EMPLOYED
   –FABRICATION DETAILS INDICATING LOCATIONS OF CONNECTORS
   –PERMANENT BRIDGING AND/OR BRACING LOCATIONS
   –HANDLING AND ERECTION INSTRUCTIONS
   –TRUSS TO TRUSS CONNECTION
4. FAILURE TO FURNISH ANY OF THE ABOVE REQUIRED DATA WILL BE REGARDED AS AMPLE REASON FOR THE REJECTION OF THE SHOP DRAWINGS. THE CONTRACTOR SHALL APPROVE FABRICATION AND INSTALLATION DRAWINGS SHOWING SIZE, SHAPE AND LAYOUT PRIOR TO SUBMITTAL FOR REVIEW BY THE ENGINEER.
5. CONNECTOR PLATES SHALL BE A MINIMUM OF 0.036" AND SHALL BE MANUFACTURED FROM MATERIAL MEETING THE REQUIREMENTS OF ASTM A446 GRADE A STEEL. PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A5252 G60 SPECIFICATIONS.
6. TRUSS MEMBERS SHALL BE ACCURATELY CUT AND FABRICATED TO INSURE AMPLE MEMBER BEARING AND TRUSS UNIFORMITY WITHIN THE TOLERANCES ESTABLISHED BY THE "TRUSS PLATE INSTITUTE QUALITY CONTROL MANUAL QCM–84".
7. FOR TRUSSES OVER 35' SPAN, ALL LUMBER SHALL BE NO. 1 GRADE MINIMUM, INCLUDING THE WEBS.
8. FOR TRUSSES UP TO 35' SPAN, ALL LUMBER SHALL BE NO. 2 GRADE MINIMUM.

MINIMUM NAILING SCHEDULE

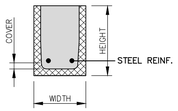
ALL NAILS SHALL BE COMMON WIRE NAILS. WHERE NAILS TEND TO SPLIT THE WOOD, HOLES SHALL BE SUBDRILLED. UNLESS OTHERWISE NOTED NAILING SHALL NOT BE LESS THAN THE FOLLOWING:

JOISTS TO BEARING – TOE NAIL EA. SIDE	2 – 16d
DOUBLE JOISTS:	
NOT BLOCKED APART – STAGGERED	16d @ 16"
BLOCKED APART – EA. BLOCK, EA. SIDE	2 – 16d
BLOCKING BETWEEN JOISTS:	
TO BEARING – TOE NAIL EA. SIDE	2 – 16d
TO JOIST 10" IN DEPTH AND GREATER:	
THRU NAIL, ONE END	3 – 20d
TOE NAIL EA. SIDE, OPP. END	3 – 16d
TO JOIST 8" IN DEPTH AND LESS:	
THRU. NAIL, ONE END	2 – 16d
TOE NAIL EA. SIDE, OPP. END	2 – 16d
BRIDGING TO JOISTS – TOE NAIL EA. END	2 – 8d
STUDS TO BEARING – TOE NAIL EA. SIDE	2 – 16d
MULTIPLE STUDS	16d @ 12" O.C.
CORNER STUDS AND ANGLES	16d @ 30" O.C.
DOUBLE TOP PLATE:	
LOWER PLATE TO TOP OF STUD	3 – 16d
UPPER PLATE TO LOWER PLATE – STAGGERED	16d @ 18" O.C.
UPPER PLATE TO LOWER PLATE AT INTERSECTION	3 – 16d
PLATE TO JOIST OR BEARING	16d @ 16" O.C.
3/8" PLYWOOD SHEATHING	8d @ 6" O.C. @ PANEL EDGES
(HORIZONTAL OR VERTICAL)	8d @ 12" O.C. @ INTER. SUPPORTS
1/2", 5/8", OR 3/4" PLYWOOD SHEATHING:	10d @ 6" O.C. @ PANEL EDGES 10d @ 12" O.C. @ INTERMEDIATE SUPPORTS
1/4" PLYWOOD FOR SUB–FLOOR:	4D @ 4" O.C. @ PANEL EDGES 4d @ 8" O.C. @ INTERMEDIATE SUPPORTS
FURRED CEILING:	
2 x 2 HANGERS TO ROOF OR CEILING JOINTS	2 – 12d
1 x 4 FURRING STRIPS TO UNDERSIDE OF JOIST EA. BEARING, ON STRAIGHT & ONE SLANT	2 – 8d

LINTEL SCHEDULE

Nominal Masonry Size	Masonry Opening (M.O.) Width			
	>8" to 2'-0"	>2'-0" to 4'-0"	>4'-0" to 6'-0"	>6'-0" to 8'-0"
8" CMU	8"x8" HIGH LINTEL	8"x16" HIGH LINTEL w/ (1) #5	8"x16" HIGH LINTEL w/ (2) #5	8"X16" HIGH LINTEL w/ (2) #7

1. ALL LINTELS SHALL HAVE MIN. 8" BEARING AT EACH END.
2. PROVIDE LINTEL BLOCKS FOR LINTELS.
3. MASONRY LINTELS SHALL BE AS SPECIFIED, FILLED MONOLITHICALLY WITH GROUT. STEEL REINFORCEMENT SHALL BE PLACED AT BOTTOM OF LINTEL BLOCK WITH 2" MIN. COVER, AS SHOWN, UNLESS NOTED OTHERWISE.
4. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS TO PROVIDE LINTELS FOR OPENINGS NOT SHOWN.



GENERAL STRUCTURAL NOTES

1) CONTRACTOR NOTES
   A. THE CONTRACT DRAWINGS REPRESENT THE DESIRED RESULT OF CONSTRUCTION. THE METHODS OF CONSTRUCTION AND THE RISKS INVOLVED DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN THE STRUCTURAL INTEGRITY OF ALL STRUCTURES AT ALL STAGES OF CONSTRUCTION.
   B. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING ANY PERTINENT WORK.
   C. ANY SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER PRIOR TO COMMENCING ANY PERTINENT WORK.
   D. LOAD-CARRYING STRUCTURAL COMPONENTS SHALL BE FABRICATED, CONSTRUCTED, AND INSTALLED IN ACCORDANCE WITH THE STRUCTURAL PLANS. IF THERE IS A DISCREPANCY OF DEPICTION OF A STRUCTURAL COMPONENT IN ANOTHER PLAN SECTION, THE STRUCTURAL PLANS SHALL CONTROL, UNLESS PRIOR WRITTEN AUTHORIZATION FROM THE ENGINEER IS PROVIDED.
   E. ALL DEMOLITION DEBRIS SHALL BE REMOVED FROM SITE & DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER UNLESS NOTED OTHERWISE.
   F. ALL NECESSARY SHORING IS THE RESPONSIBILITY OF THE CONTRACTOR.

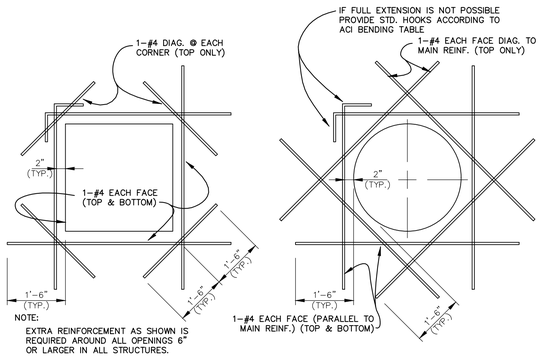
2) MASONRY
   A. ALL CONCRETE MASONRY UNITS (CMUS) SHALL BE OF LOAD-BEARING TYPE WITH A MINIMUM COMPRESSIVE STRENGTH OF F'_M = 1,500 PSI AT 28 DAYS. UNITS SHALL MEET THE CURRENT SPECIFICATION OF ASTM C90.
   B. ALL WALLS WHICH ARE NOT EXPOSED TO EARTH OR WEATHER SHALL BE 2-CELL BLOCK, MADE OF LIGHTWEIGHT AGGREGATE. ALL WALLS WHICH ARE EXPOSED TO EARTH OR WEATHER SHALL BE 2-CELL BLOCK, MADE OF NORMAL-WEIGHT AGGREGATE.
   C. ALL MORTAR FOR UNIT MASONRY SHALL COMPLY WITH THE REQUIREMENTS OF ASTM C270. TYPE S.
   D. HORIZONTAL WIRE REINFORCING SHALL BE 9 GAUGE CONTINUOUS LADDER-TYPE UNITS, WHICH COMPLY WITH ASTM A82, AND SHALL BE SPACED AT 16" O.C.
   E. PROVIDE A BOND BEAM AT THE TOP AND BOTTOM OF ALL LOAD-BEARING AND NON-LOAD BEARING CMU WALLS. IN EXTERIOR AND LOAD-BEARING WALLS, PROVIDE ADDITIONAL BOND BEAMS AT 4'-0" O.C. VERTICALLY. BOND BEAMS SHALL BE REINFORCED WITH 1-#4 CONTINUOUS BAR, UNLESS NOTED OTHERWISE.
   F. VERTICAL REINFORCING SHALL BE OF SIZE AND SPACING PER PLAN, PLUS ONE ADDITIONAL BAR AT EACH DOOR/WINDOW JAMB (AND ABOVE AND BELOW DOOR/WINDOW OPENINGS), AND AT EACH BUILDING CORNER AND WHERE ADDITIONAL REINFORCING IS INDICATED.
   G. SPLICES IN CONTINUOUS VERTICAL OR HORIZONTAL REINFORCING BARS SHALL BE PER ACI-530 OR 48 BAR DIAMETERS, WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE. SPLICES SHALL BE CONTINUOUS OR SPLICED WITH DOWELS AT CORNERS.
   H. FILL CELLS OF BLOCK AT VERTICAL REINFORCING AND WHERE INDICATED WITH CONCRETE, HAVING A MAXIMUM 3/8" LARGE AGGREGATE ("GROUT"), A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI AT 28 DAYS, AND COMPLYING WITH ASTM C476.
   I. ALL LOAD-BEARING CMU WALLS SHALL BE CONSTRUCTED SUCH THAT BLOCK IS INTERLOCKING AT ALL WALL CORNERS AND INTERSECTIONS. A VERTICAL COLD JOINT SHALL NOT BE PERMITTED AT THE JUNCTURE OF TWO LOAD-BEARING CMU WALLS. ALL NON-LOAD BEARING CMU WALLS SHALL BE CONSTRUCTED SUCH THAT THE BLOCK IS INTERLOCKING AT THE CORNER/ INTERSECTION OF AT LEAST ONE END OF THE WALL.
   J. ANY WALL REINFORCEMENT THAT IS INTERRUPTED SHALL BE OFFSET AND CONTINUED IMMEDIATELY ADJACENT.

INFORMATION REQUIRED BY 2015 IBC / 2018 KBC SECTION 1603

1603.1.1	FLOOR LIVE LOAD	
	1) SLAB ON GRADE:	100 PSF UNIF / 2,000 LB CONC
	2) WALKWAYS & STAIRS:	100 PSF UNIF / 300 LB CONC
1603.1.2	ROOF LIVE LOAD	
	1) ALL ROOFED STRUCTURES:	20 PSF UNIF / 300 LB CONC
1603.1.3	ROOF SNOW LOAD DATA	
	1) GROUND SNOW LOAD (P_G)	20 PSF
	2) FLAT-ROOF SNOW LOAD (P_f)	15.1 PSF
	3) SNOW EXPOSURE FACTOR (C_E)	0.9
	4) SNOW LOAD IMPORTANCE FACTOR (I_S)	1.2
	5) THERMAL FACTOR (C_T)	1.0
1603.1.4	WIND DESIGN DATA	
	1) ULTIMATE DESIGN WIND SPEED (V_{ULT})	120 MPH
	2) RISK CATEGORY	IV
	3) WIND EXPOSURE	C
	4) INTERNAL PRESSURE COEFFICIENT (GC_{Pi})	N/A (ENCLOSED SIMPLE DIAPHRAGM, LOW RISE)
	5) DESIGN WIND PRESSURES	15.1 PSF (LATERAL) -19.1 PSF (VERTICAL)
1603.1.5	EARTHQUAKE DESIGN DATA	
	1) RISK CATEGORY	IV
	2) SEISMIC IMPORTANCE FACTOR (I_E)	1.50
	3) MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS:	
	A. S_S =	0.162G
	B. S_1 =	0.076G
	4) SITE CLASS	D
	5) DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS:	
	A. S_{DS} =	0.173G
	B. S_{D1} =	0.122G
	6) SEISMIC DESIGN CATEGORY	C
	7) BASIC SEISMIC FORCE-RESISTING SYSTEM:	
	A. BUILDING FRAME SYSTEM | ORDINARY REINFORCED MASONRY SHEAR WALLS	
	8) DESIGN BASE SHEAR (V_S)	0.130W
	9) SEISMIC RESPONSE COEFFICIENT (C_S)	0.130
	10) RESPONSE MODIFICATION COEFFICIENT (R)	2.0
	11) ANALYSIS PROCEDURE USED:	EQUIVALENT LATERAL FORCE PROCEDURE (ELFP)
1603.1.6	GEOTECHNICAL INFORMATION	
	1) ALLOWABLE BEARING CAPACITY	1,500 PSF
1603.1.7	FLOOD DESIGN DATA	NOT APPLICABLE
1603.1.8	SPECIAL LOADS	NOT APPLICABLE

SPECIAL INSPECTIONS

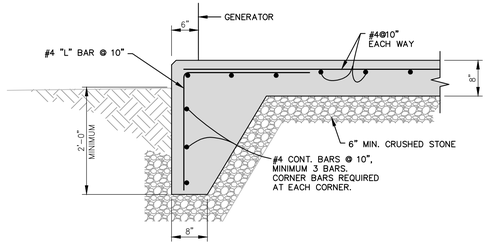
1) THE SPECIAL INSPECTION AGENCY WILL BE LE GREGG ASSOCIATES | 2456 FORTUNE DRIVE, SUITE 155 | LEXINGTON, KENTUCKY | 40509 | (859) 252-7558 PHONE.
2) THE FOLLOWING IS A PARTIAL LISTING OF OPERATIONS WHICH ARE SUBJECT TO SPECIAL INSPECTIONS, IN ACCORDANCE WITH 2015 IBC / 2018 KBC. THIS IS NOT INTENDED TO BE A COMPLETE LISTING, AS A THOROUGH OUTLINE IS PROVIDED IN THE IBC / KBC, AND IS HEREBY INCLUDED BY REFERENCE. ADDITIONAL INFORMATION IS ALSO INCLUDED IN SPECIFICATION SECTION 01420. SPECIAL INSPECTIONS SHALL BE REQUIRED FOR THE FOLLOWING TYPES OF WORK:
   A. CONCRETE CONSTRUCTION: INCLUDING REINFORCEMENT, FORMWORK, DELIVERY, AND PLACEMENT.
   B. MASONRY CONSTRUCTION: INCLUDING CMU WALLS AND ALL ASSOCIATED APPURTENANCES.
   C. WOOD CONSTRUCTION: INCLUDING MEMBER SIZE AND PLACEMENT, VERIFICATION OF FABRICATOR APPROVAL, OBSERVATION OF ERECTION FOR PROPER TECHNIQUES.
   D. SOILS: VERIFICATION AND INSPECTION OF SOILS, DENSITIES, LIFT THICKNESSES, AND DESIGN BEARING CAPACITIES.



NOTE:
EXTRA REINFORCEMENT AS SHOWN IS REQUIRED AROUND ALL OPENINGS 6" OR LARGER IN ALL STRUCTURES.

TYPICAL REINFORCEMENT AROUND OPENINGS IN WALLS & FLOORS

NOT TO SCALE



TYPICAL GENERATOR PAD DETAIL

NOT TO SCALE

STATE OF KENTUCKY
DAVID M. HOWELL
29100
LICENSED PROFESSIONAL ENGINEER
12/13/24

DESIGNER	DMH	DATE	BY	REVISION
DRAWN	LGL			
CHECKED	DMH			
APPROVED	DMH			

GRAPHIC SCALE

SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278–5412
Hopkinsville, KY (270) 886–5466
Somerset, KY (606) 485–4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

BOOSTER PUMP STATION
STRUCTURAL DETAILS

DIVISION	–
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GENERAL PIPING NOTES BPS

PROVIDE A LEAK FREE CONNECTION ANY PLACE WHERE PIPE TRANSITIONS FROM PVC TO COPPER OR PVC TO METAL. THE LEAK FREE CONNECTION SHALL CONSIST OF SOME FORM OF TRANSITION FITTING SUCH AS SPEARS MANUFACTURING COMPANY'S METAL-TO-PLASTIC TRANSITIONS, STRAUB PIPE JOINT OR EQUAL.

PROVIDE SCHEDULE 80 PVC PIPE FOR ALL CHEMICAL FILL, TRANSFER, AND FEED CARRIER PIPING EXCEPT FOR THE FOLLOWING: PROVIDE SCHEDULE 80 CPVC FOR THE SODIUM HYPOCHLORITE BULK TANK FILL PIPING. WHERE CHEMICAL LINES LEAVE BUILDINGS OR STRUCTURES AND TRAVEL UNDERGROUND IN COVER PIPES HDPE PIPE/TUBING MAY BE USED WHEN IT IS COMPATIBLE WITH THE CHEMICAL IT IS CARRYING. THE HDPE PIPE/TUBING SHALL BE ONE CONTINUOUS PIECE EXCEPT WHERE NOT POSSIBLE IN WHICH CASE THE NUMBER OF JOINTS SHALL BE KEPT TO A MINIMUM. THE NUMBER OF JOINTS SHALL BE KEPT TO A MINIMUM REGARDLESS OF THE TYPE OF PIPE USED WHEN PIPE IS RUN UNDERGROUND.

PROVIDE CLEAR SCHEDULE 40 PVC PIPE AND WHITE SCHEDULE 40 PVC FITTINGS FOR ALL CHEMICAL LINE COVER PIPE (SECONDARY CONTAINMENT PIPE) NOT UNDERGROUND. WHEN UNDERGROUND, COVER PIPE MAY BE SCHEDULE 80 PVC, SCHEDULE 80 CPVC, MINIMUM DR 9 HDPE, OR MINIMUM DR 9 PP. THE COVER PIPE MATERIAL USED SHALL BE COMPATIBLE WITH THE CHEMICALS IN THE CARRIER PIPES WHICH IT CONTAINS.

PROVIDE PVC, PVDF OR PTFE TUBING, AS APPROPRIATE FOR THE CHEMICAL, FOR THE LAST COUPLE FEET OF LINE JUST PRIOR TO AND AFTER METERING PUMPS AND FOR THE LAST COUPLE FEET OF CHEMICAL FEED LINE, JUST PRIOR TO CONNECTING TO THE FEED LOCATION(S).

PROVIDE A DRAIN PORT (TEE WITH THREADED PLUG) APPROXIMATELY EVERY 20 LINEAR FEET OF PIPE FOR THE SECONDARY (CONTAINMENT) PIPING OR AS RECOMMENDED BY THE DOUBLE CONTAINMENT PIPING MANUFACTURER, WHICHEVER IS SHORTER. PROVIDE A MINIMUM OF ONE DRAIN PORT, REGARDLESS OF LINE LENGTH.

PROVIDE A DOUBLE CONTAINED PIPING SYSTEM, UNLESS NOTED OTHERWISE, FOR ALL CHEMICAL LINES. TANK VENT AND OVERFLOW LINES DO NOT NEED TO BE DOUBLE CONTAINED. NON-DIMPED CHEMICAL LINES INSIDE CHEMICAL CONTAINMENT SUMPS WHERE THE CONTAINMENT WALLS ARE LESS THAN 6 FEET HIGH SHALL BE PROVIDED WITH DOUBLE CONTAINED PIPING OR OTHER ENGINEER APPROVED MEANS OF CHEMICAL SPRAY DEFLECTION TO PREVENT LEAKING CHEMICAL FROM LEAVING THE CONTAINMENT SUMP. SPLASH CURTAINS ARE AN APPROVED MEANS OF SPRAY DEFLECTION. ALL CHEMICAL FEED LINES IN PIPE TRENCHES WITH SOLID COVERS DO NOT NEED TO BE DOUBLE CONTAINED.

PAINT/STENCIL THE COVER PIPE IN DOUBLE CONTAINED CHEMICAL LINES APPROXIMATELY EVERY 10 FEET AND AS NOTED IN SECTION 09900.

PROVIDE EXPANSION JOINTS, EXPANSION BENDS, STRAUB PIPE COUPLINGS, OR EQUAL DESIGNED FOR PIPE EXPANSION OR CONTRACTION, ETC., FOR ALL PLASTIC PIPE RUNS AS RECOMMENDED BY THE PIPE MANUFACTURER/ SUPPLIER.

PROVIDE TYPE K OR TYPE L COPPER PIPE OR TUBING, AS SPECIFIED, FOR ALL POTABLE WATER, PLANT SERVICE WATER AND SAMPLE LINES 2.5 INCH AND SMALLER UNLESS SHOWN OTHERWISE ON THE DRAWINGS. PROVIDE DUCTILE IRON PIPE, AS SPECIFIED AND SHOWN ON THE DRAWINGS, FOR ALL POTABLE WATER AND PLANT SERVICE WATER LINES 3 INCHES AND LARGER. AS AN ALTERNATIVE, THREADED SCHEDULE 40 TYPE 304L/316L STAINLESS STEEL MAY BE USED FOR 2 INCH AND SMALLER WATER LINES AND SCHEDULE 10S TYPE 304L/316L STAINLESS STEEL PIPE MAY BE USED FOR 2.5 INCH AND LARGER WATERLINES.

WHERE STAINLESS STEEL PIPING IS SHOWN ON THE DRAWINGS, AS A MINIMUM, FLANGES SHALL BE PROVIDED WHERE SHOWN REGARDLESS OF WHETHER OR NOT A SUPPLIER FEELS THEY ARE NECESSARY. WHEN STAINLESS STEEL PIPING IS PROPOSED WHERE IT IS NOT SHOWN, FLANGES OR UNIONS, ETC., SHALL BE PROVIDED WHICH ALLOW FOR EASY REMOVAL OF VALVES, INSTRUMENTATION, ETC. FLANGES SHALL BE MADE OF 304L STAINLESS STEEL UNLESS ANOTHER MATERIAL IS NOTED OR SPECIFIED.

PROVIDE BOLTED DOWN DUCTILE IRON BASE FITTINGS WHERE BASE FITTINGS ARE CALLED FOR UNLESS NOTED OTHERWISE.

PROVIDE RED VALVE, SNYDER'S FLEXMASTER, GARLOCK OR EQUAL EXPANSION JOINTS FOR ALL PIPING CONNECTIONS TO PLASTIC OR FRP TANKS AND RED VALVE, PROCO, GARLOCK OR EQUAL EXPANSION JOINTS TO ALL PUMPS. THE EXPANSION JOINT'S MATERIAL OF CONSTRUCTION SHALL BE COMPATIBLE WITH THE LIQUID FLOWING THROUGH THE LINE. THE EXPANSION JOINT SHALL AS A MINIMUM HAVE A PRESSURE RATING OF 50 PSI AND A VACUUM RATING OF 15 INCHES OF MERCURY WHEN USED ON TANKS OR PUMP SUCTION LINES AND A MINIMUM PRESSURE RATING OF 150 PSI WHEN USED ON PUMP DISCHARGE LINES UNLESS NOTED OTHERWISE. ALL EXPANSION JOINTS USED ON PUMP SUCTION AND DISCHARGE PIPING SHALL INCLUDE CONTROL RODS/UNITS OR THE PIPING SHALL BE OTHERWISE RESTRAINED AS REQUIRED BY THE EXPANSION JOINT SUPPLIER.

FOR WATER PIPES THROUGH CONCRETE WALLS, PROVIDE PIPES GROUTED IN PLACE UNLESS NOTED OR SHOWN OTHERWISE SUCH AS TO USE LINK SEALS OR EQUAL. IF THE PIPE IS TO BE FORMED IN THE WALL WHEN POURED IT SHALL HAVE A CONTINUOUSLY WELDED OR OTHERWISE ATTACHED WATER STOP AROUND THE FULL CIRCUMFERENCE OF THE PIPE IF THE PIPE IS UNDERGROUND OR IN A WATER HOLDING BASIN OR TANK WHERE WATER COULD PASS THROUGH THE WALL.

PROVIDE COVER PIPE WITH LINK SEALS OR EQUAL OR PIPING SPACERS FOR ALL CHEMICAL LINES THROUGH CONCRETE WALLS AS APPROPRIATE. PROVIDE LINK SEALS OR EQUAL, UNLESS SHOWN OTHERWISE, BETWEEN THE CARRIER PIPE AND THE COVER PIPE FOR ALL CHEMICAL PIPES TRAVERSING FROM INDOORS TO OUTDOORS OR VICE VERSA.

WHERE LINK-SEALS OR EQUAL ARE SHOWN OR CALLED FOR GROUT SHALL NOT BE USED TO FILL THE ANNULAR SPACE AROUND THE PIPE UNLESS THE CAVITY LEAKS WATER AND ALL POSSIBLE ADJUSTMENTS TO THE LINK-SEALS OR EQUAL HAVE BEEN MADE. IF THE CAVITY IS FOUND TO LEAK WATER PRIOR TO OR DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL ADJUST THE LINK-SEAL(S) OR EQUAL TO FIX THE PROBLEM. IF IT IS DETERMINED THAT THE LINK-SEAL OR EQUAL ALONE CANNOT ELIMINATE THE LEAK, THE CONTRACTOR SHALL PLACE NON-SHRINK GROUT IN THE CAVITY.

ALL CHEMICAL FEED LINES THAT END WITH A CONNECTION TO A PIPE SHALL HAVE AN INJECTION QUILL. PROVIDE INJECTION QUILLS WITH SAF-T SEAL ELASTOMERIC TIPS FOR SODIUM HYPOCHLORITE LINES. INJECTION QUILLS SHALL EXTEND IN MINIMUM OF ONE THIRD (1/3) OF THE WAY INTO THE PIPE BUT HALF WAY IS PREFERRED. SEE THE CHEMICAL INJECTION QUILL OR DIFFUSER PIPE DETAIL ON THE DRAWINGS FOR MORE INFORMATION. INJECTION QUILLS AND DIFFUSER PIPES SHALL BE RETRACTABLE UNITS OF PVC OR CPVC AS MANUFACTURED BY SAF-T-FLO OR EQUAL FOR PIPES 12 INCHES IN DIAMETER AND SMALLER. WHERE PIPES ARE LARGER THAN 12 INCHES IN DIAMETER OR THE IN-PIPE VELOCITY IS GREATER THAN 6 FEET PER SECOND THE DIFFUSER PIPES SHALL BE METALLIC AND COMPATIBLE WITH THE CHEMICAL BEING FED.

WHERE TAPS ARE REQUIRED, THEY CAN BE MADE DIRECTLY INTO DUCTILE IRON PIPE WHEN THE TAP IS 1 INCH OR SMALLER AND WHEN THE TAP IS LARGER THAN 1 INCH OR INTO OTHER PIPE MATERIALS TAPPING SADDLES/SERVICE CLAMPS SHALL BE USED. TAPS MADE DIRECTLY INTO DUCTILE IRON PIPE SHALL USE 2 LAYERS OF THREAD SEALANT TAPE WITH THE CORPORATION STOP, ETC., TIGHTENED TO A MINIMUM 30 FT-LBF OF TORQUE OR TO A HIGHER TORQUE VALUE IF NEEDED TO PREVENT LEAKAGE. TAPPING SADDLES SHALL BE MANUFACTURED SPECIFICALLY FOR USE WITH THE PIPE UPON WHICH IT IS TO BE INSTALLED. SERVICE CLAMPS FOR USE ON DUCTILE IRON PIPE SHALL BE BRONZE, DOUBLE STRAP, MUELLER BR2B SERIES, FORD OR EQUAL FOR SERVICE/FEEDER LINES CARRYING WATER, AND FOR SERVICE/FEEDER LINES CARRYING CHEMICALS THE SERVICE SADDLE SHALL BE STAINLESS STEEL, MINIMUM TYPE 304/304L AS MANUFACTURED BY ROMAC INDUSTRIES SERIES 300, FORD, SMITH-BLAIR, OR EQUAL. SERVICE CLAMPS ON PVC AND POLYETHYLENE PIPE SHALL BE BRONZE WIDE STRAP, 2 PIECE FOR 2 THROUGH 8-INCH MAINS MUELLER H-01300 SERIES AND FOR 10 INCH AND LARGER, 3 PIECE MUELLER H13000 SERIES, FORD, OR EQUAL FOR SERVICE/FEEDER LINES CARRYING WATER AND FOR SERVICE/FEEDER LINES CARRYING CHEMICALS THE SERVICE SADDLE SHALL BE AS NOTED FOR DUCTILE IRON PIPE. FOR TAPS 4 INCH AND LARGER TAPPING SLEEVES OF STAINLESS STEEL WITH A PRESSURE RATING OF 150 PSI OR AS NEEDED FOR THE LINE TO BE TAPPED SHALL BE PROVIDED AS MANUFACTURED BY ROMAC INDUSTRIES, FORD, SMITH-BLAIR, OR EQUAL OR OF DUCTILE IRON RATED FOR 250 PSI THROUGH 24 INCH AS MANUFACTURED BY AMERICAN FLOW CONTROL SERIES 2800, OR EQUAL.

PIPES LEAVING STRUCTURES SHALL HAVE JOINTS LOCATED APPROXIMATELY WHERE SHOWN. THE CONTRACTOR MAY PLACE A JOINT CLOSER TO THE STRUCTURE'S WALL IF THE JOINT LOCATION IS NOT DIMENSIONED OR OTHERWISE NOTED WITH THE MINIMUM DISTANCE FROM THE WALL BEING 6 INCHES UNLESS WALL PIPE IS USED.

ALL PLANT WATER, POTABLE WATER, SAMPLE PIPING AND CHEMICAL SYSTEM PIPING AND APPURTENANCES INCLUDING TUBING SHALL BE DESIGNED TO HAVE A MAXIMUM OPERATING/WORKING PRESSURE OF AT LEAST 150 PSIG AT 73.4 DEGREES FAHRENHEIT UNLESS NOTED OTHERWISE.

WHERE A PIECE OF EQUIPMENT HAS A MAXIMUM OPERATING PRESSURE OF LESS THAN 150 PSI AND THE WATER SUPPLY LINE HAS A PRESSURE GREATER THAN THE EQUIPMENT CAN HANDLE A PRESSURE REDUCING VALVE SHALL BE PROVIDED.

A MINIMUM OF 2 WRAPS OF TEFLON TAPE OR OTHER COMPATIBLE THREAD WRAP SHALL BE PLACED AROUND THE THREADS OF CORPORATION STOPS, OR OTHER THREADED ITEMS THAT WILL BE THREADED INTO PIPES TO ENSURE WATERTIGHTNESS AND PROTECT THE THREADS FROM CHEMICALS, ETC.

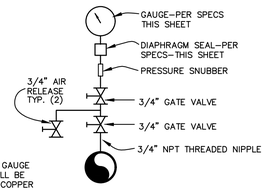
CHEMICAL COVER PIPES LOCATED UNDER FLOOR SLABS SHALL BE CONCRETE ENCASED WHEN THE SLAB IS ABOVE SOIL.

DIAPHRAGM SEAL SPECS

LIQUID FILLED DIAPHRAGM SEALS SHALL BE INSTALLED ON ALL GAUGES. DIAPHRAGM SEALS SHALL BE OF THE CONTINUOUS DUTY TYPE, 3 PIECE CONSTRUCTION WITH 1/4" FLUSHING CONNECTION 316 STAINLESS STEEL LOWER HOUSING AND DIAPHRAGM MATERIALS, 1/4" GAUGE CONNECTION AND 1/2" LOWER CONNECTION. VITON DIAPHRAGMS ARE REQUIRED ON LOW RANGE PRESSURE APPLICATIONS (LESS THAN 15 PSIG). HOUSING BOLTS SHALL ALSO BE STAINLESS STEEL. ACCEPTABLE MODELS ARE MARSH 42-01, HELICOID 100-H, OR EQUAL. DIAPHRAGM SEALS SHALL BE "PERMANENTLY" ATTACHED TO GAUGES BY INSTALLATION OF A LEAD SEALED WIRE CONNECTING THE TWO. THIS IS TO PREVENT ACCIDENTAL LOSS OF FILL FLUID. FILL FLUID SHALL BE FACTORY INSTALLED SILICONE. ALL GAUGES SHALL BE PRECALIBRATED.

GAUGE SPECIFICATIONS

GAUGE SHALL HAVE PHOSPHOR BRONZE BOURDON TUBES, WHITE LAMINATED PHENOL DIALS. GAUGES SHALL BE 4 1/2" AND HAVE MICROMETER ADJUSTMENT OF POINTERS AND BLACK PHENOL, BLACK CAST IRON, BRASS OR ALUMINUM CASE AND RING, ROTARY GEAR DESIGN, CORROSION RESISTANT, STN. STL. MOVEMENT, BLOWOUT PROTECTION, AND BRONZE SOCKETS W/ WRENCH FLATS. ACCURACY SHALL BE WITHIN 1/2 OF 1% OF THE SCALE RANGE. THEY SHALL BE MANUFACTURED BY HELICOID GAUGE DIVISION, "410"; JAMES P. MARSH CORP. "MASTERGAUGE"; ASHCROFT; U.S. GAUGE; OR EQUAL. ALL GAUGES SHALL BE PRECALIBRATED.



NOTE:
ALL AIR & GAUGE PIPING SHALL BE BRASS OR COPPER

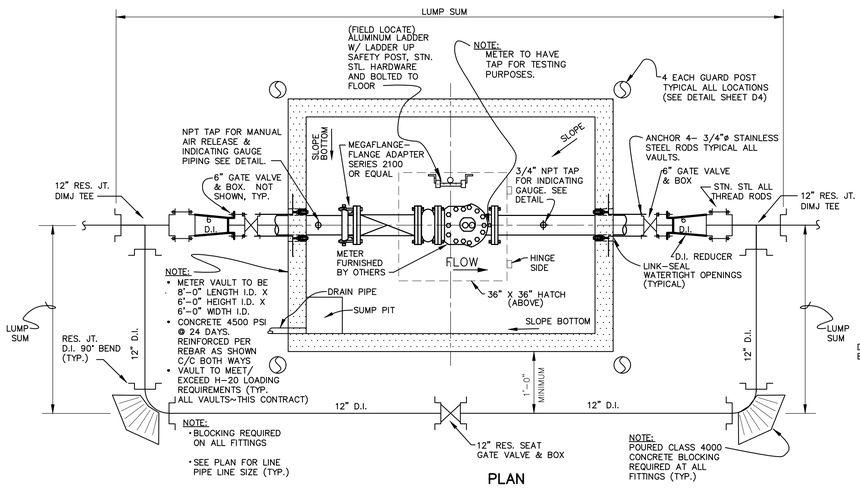
AIR RELEASE PIPING & INDICATING GAUGE

AIR RELEASE & GAUGE ASSEMBLIES

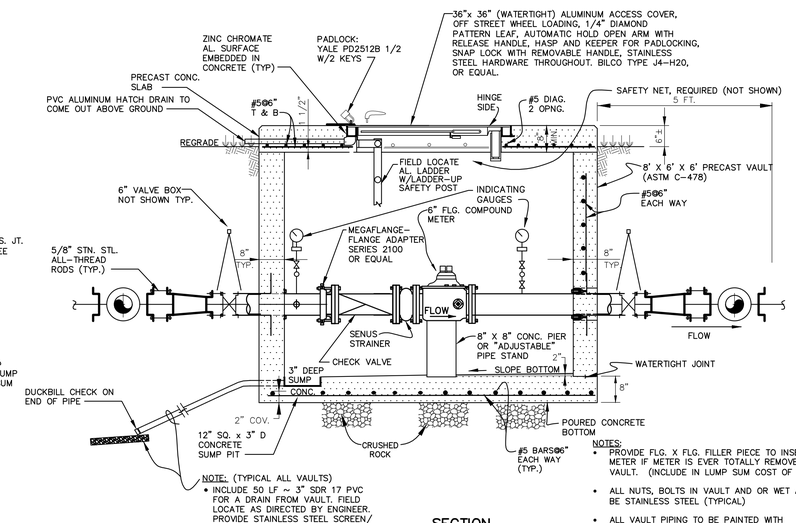
NOT TO SCALE

PRESSURE GAUGE RANGE TABLE

	RANGE		FIGURE INTERVAL		MINOR GRADATION	
	INNER-psi	OUTER-ft H_2O	psi	ft H_2O	psi	ft H_2O
SUCTION	0/60	0/140	5	20	1	2
DISCHARGE	0/300	0/690	25	50	5	10



PLAN



SECTION

DETAIL
MASTER METER VAULT
NOT TO SCALE

STATE OF KENTUCKY DAVID E. GERNERT 20705 LICENSED PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

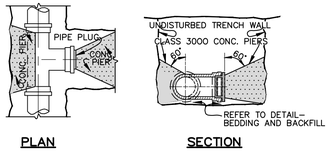
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

MASTER METER VAULT DETAILS, GENERAL PIPING NOTES, AND PRESSURE GAUGE DETAILS

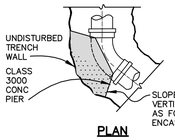
DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	13 OF 17

BOXLOK VALVE BOX ALIGNMENT DEVICE MODEL 2 TO BE INSTALLED IN ALL NEW VALVE BOXES
NOT TO SCALE

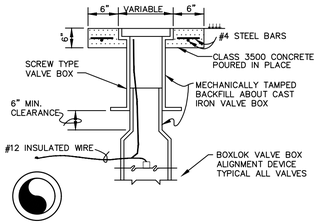
NOTE:
FITTINGS SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE AT ALL THRUST BLOCKS, PLACED SO FITTINGS, BOLTS AND NUTS DO NOT COME IN CONTACT WITH CONCRETE. IF MECHANICAL JOINT PLUG IS USED ON THE BRANCH, NO BLOCKING WILL BE REQUIRED ON THE PLUG. THE SIDE OF THE TEE SHALL BE BLOCKED IN ALL CASES.



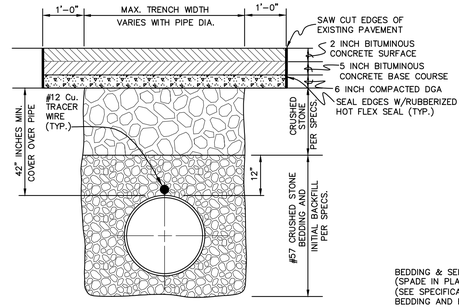
TYPICAL DETAIL OF CONCRETE BLOCKING AT TEES & PLUGS



TYPICAL DETAIL OF CONCRETE BLOCKING AT HORIZONTAL BENDS
NOT TO SCALE

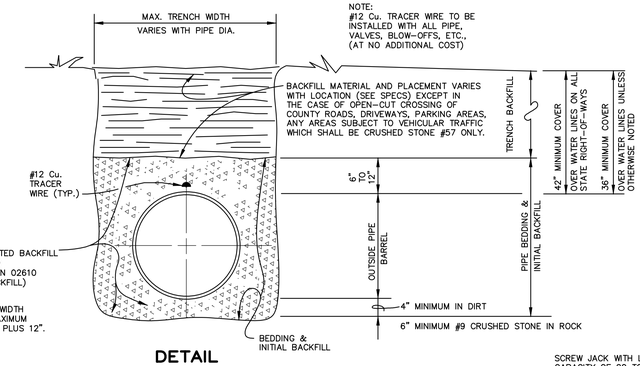


CONCRETE VALVE BOX COLLAR
NOT TO SCALE
(REQUIRED ON ALL VALVES)

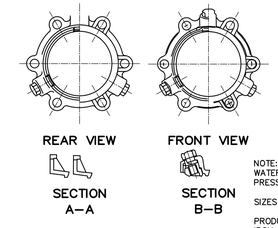


NOTE:
WHERE EXISTING ROAD/DRIVE SURFACE IS CONCRETE, SUBSTITUTE CONCRETE FOR BITUMINOUS CONCRETE, OF DEPTH EQUAL TO EXISTING CONCRETE DEPTH.

TRENCH DETAIL
TYPICAL OPEN CUT CROSSING OF COUNTY ROADS AND DRIVEWAYS
NOT TO SCALE

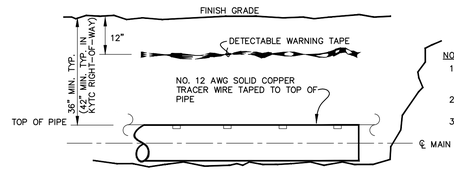


DETAIL
BEDDING & BACKFILL WATER MAIN INSTALLATION
NOT TO SCALE



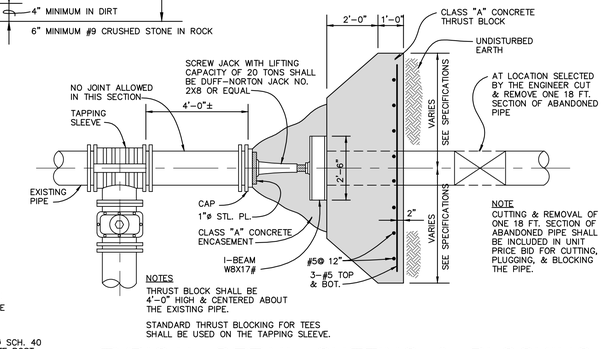
NOTE:
WATER WORKING PRESSURE 250 PSI MIN.
SIZES 3"–48"
PRODUCT OF EBAA IRON, INC. OR EQUAL

MEGALUG JOINT RESTRAINT
NOT TO SCALE

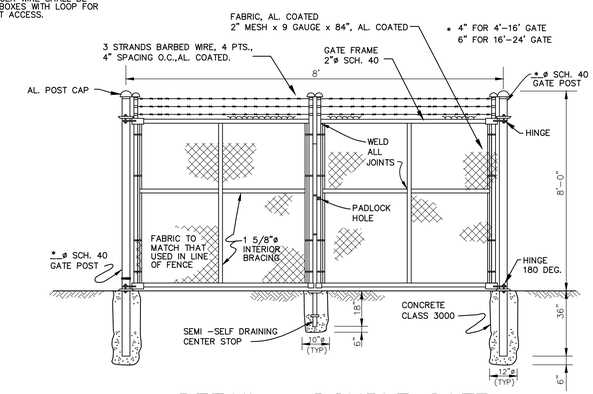


NOTES:
1. PVC, PE OR D.I. WATERLINE TO BE BACKFILLED 2 FEET– THEN PLACE DETECTABLE TAPE DIRECTLY OVER PIPE.
2. TAPE TO BE TIED TO ALL MAIN LINES, SERVICE LINES, VALVES, WATER METERS AND HYDRANTS.
3. NO. 12 AWG COPPER TRACER WIRE SHALL BE PULLED INTO ALL VALVE BOXES WITH LOOP FOR TEST/LOCATOR EQUIPMENT ACCESS.

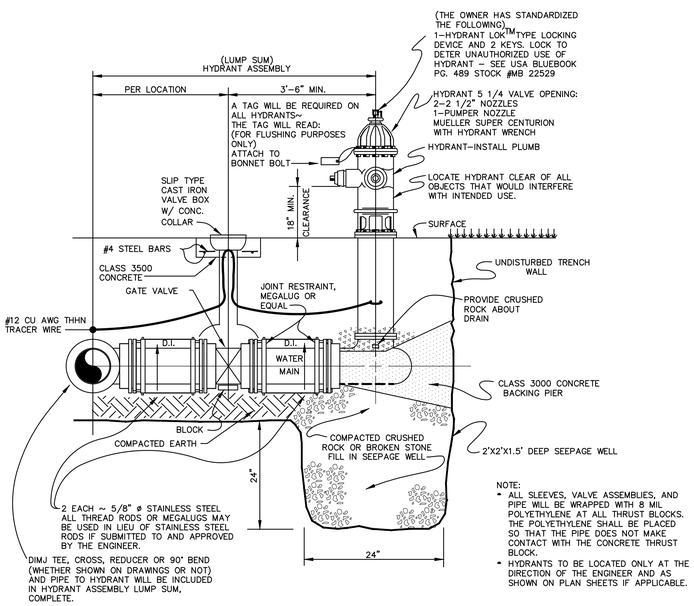
TYPICAL PVC, D.I. OR POLYETHYLENE WL WITH NO. 12 AWG TRACER WIRE AND DETECTABLE TAPE INSTALLATION
NOT TO SCALE



TYPICAL DETAIL CUTTING & BLOCKING AT TAP INTO EXISTING LINE (LUMP SUM)
NOT TO SCALE

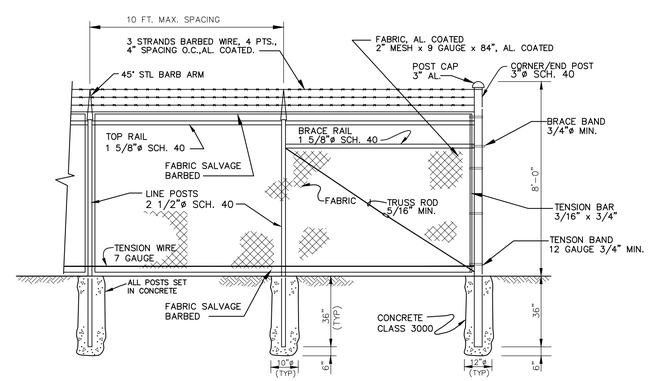


DETAIL – DOUBLE GATE
NOT TO SCALE



NOTE:
* ALL SLEEVES, VALVE ASSEMBLIES, AND PIPE WILL BE WRAPPED WITH 8 MIL POLYETHYLENE AT ALL THRUST BLOCKS. THE POLYETHYLENE SHALL BE PLACED SO THAT THE PIPE DOES NOT MAKE CONTACT WITH THE CONCRETE THRUST BLOCK.
* HYDRANTS TO BE LOCATED ONLY AT THE DIRECTION OF THE ENGINEER AND AS SHOWN ON PLAN SHEETS IF APPLICABLE.

FLUSHING HYDRANT ASSEMBLY (LUMP SUM)
NOT TO SCALE



DETAIL – SECURITY FENCE
NOT TO SCALE

STATE OF KENTUCKY
DAVID E. GERNERT
20705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: AS NOTED

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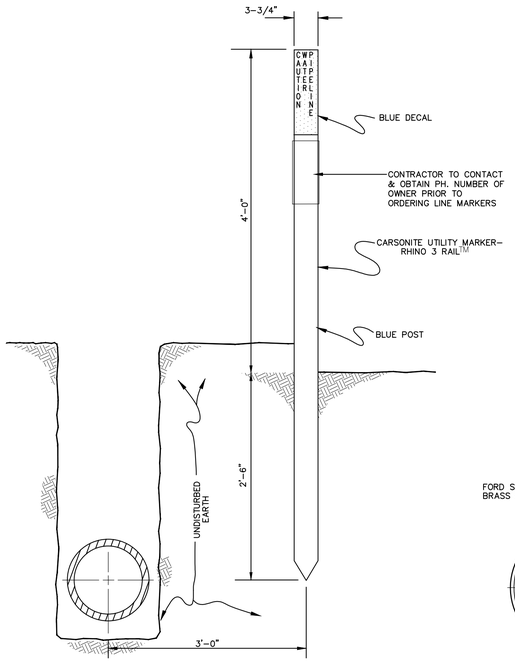
Somerset, KY (606) 485–4011

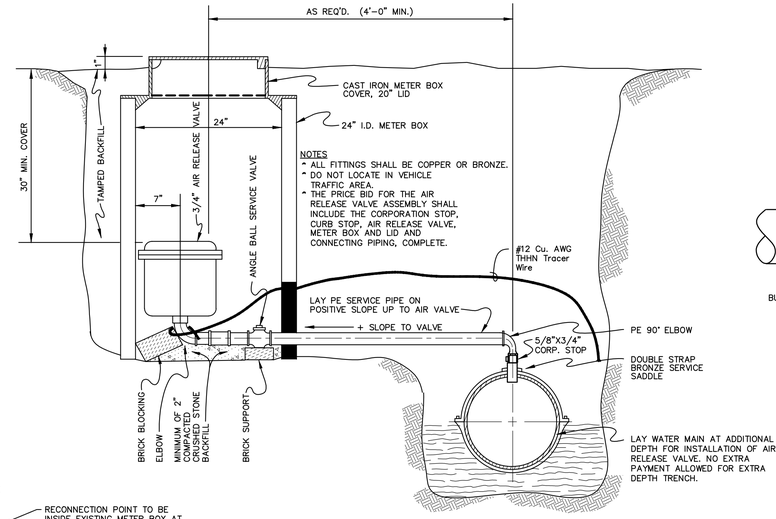
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

MISCELLANEOUS DETAILS

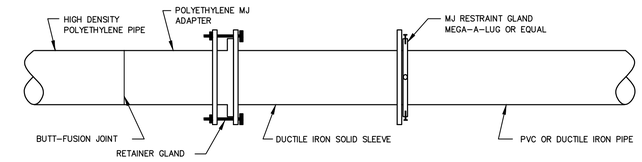
DIVISION	–
CONTRACT NO.	691–21–01
DATE	SEPTEMBER 2021
SHEET NO.	14 OF 17



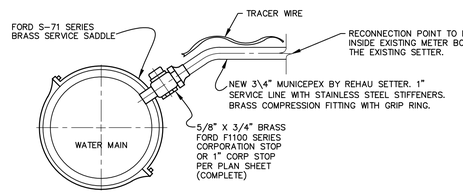
DETAIL
FLEXIBLE FIBERGLASS COMPOSITION LINE MARKER
NOT TO SCALE



AUTOMATIC AIR RELEASE VALVE ASSEMBLY
NOT TO SCALE
(LOCATE AIR RELEASE OUT OF ANY TRAFFIC AREA)
(LOCATE AT HIGH POINT)

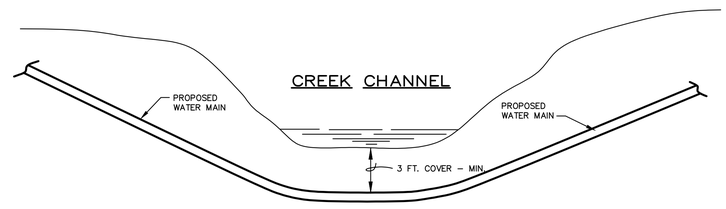


HDPE TO PVC/DUCTILE IRON PIPE TRANSITION DETAIL ON DIRECTIONAL BORES
NOT TO SCALE
(TYPICAL EACH END)



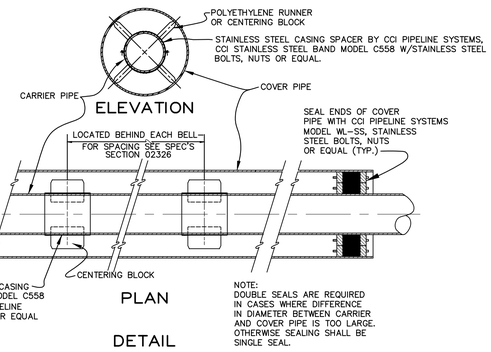
RECONNECT TO EXISTING METER
NOT TO SCALE

MAINTAIN 3 FT. COVER OVER WATER MAIN IN CREEK CHANNEL ~ ERODIBLE OR NON-ERODIBLE CONDITION.



CONTRACTOR TO INSTALL WATER MAIN EXTRA DEPTH, AS NECESSARY TO FIT CREEK CHANNEL.

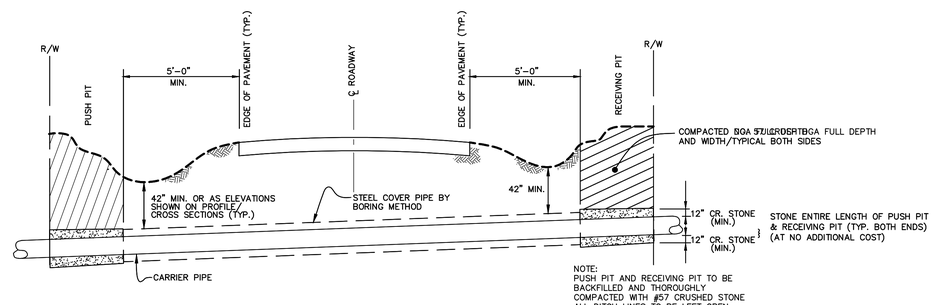
TYPICAL SECTION WATER MAIN @ CREEK CROSSING
NOT TO SCALE



NOTE:
SPACERS NOT REQUIRED ON PE DIRECTIONAL DRILLS.

NOTE:
DOUBLE SEALS ARE REQUIRED IN CASES WHERE DIFFERENCE IN DIAMETER BETWEEN CARRIER AND COVER PIPE IS TOO LARGE. OTHERWISE SEALING SHALL BE SINGLE SEAL.

DETAIL
CARRIER PIPE POSITIONING IN COVER PIPE
NOT TO SCALE



NOTE:
PUSH PIT AND RECEIVING PIT TO BE BACKFILLED AND THOROUGHLY COMPACTED WITH #57 CRUSHED STONE ALL DITCH LINES TO BE LEFT OPEN. SEED AND STRAW ALL AREAS DISTURBED BY THIS WORK IMMEDIATELY AFTER COMPLETING WORK. ALL DISTURBED ASPHALT OR CONCRETE SURFACES TO BE REPLACED WITH A MIN. OF 6" THICK ASPHALT OR CONCRETE.
IF BORE PI IS IN APPROVED AREA CAST OF SURFACE RESTORATION SHALL BE INCLUDED IN THE UNIT PRICE FOR BORING. NO ADDITIONAL PAYMENT WILL BE MINE.

DETAIL
TYPICAL HIGHWAY BORING
NOT TO SCALE

NOTE:
1. ALL NEW HYDRANTS INSTALLED SHALL BE COVERED WITH "NOT IN SERVICE" BAG UNTIL THEY ARE PUT IN SERVICE.
2. ALL EXISTING HYDRANTS SHALL BE COVERED WITH "NOT IN SERVICE BAG" ONCE THE EXISTING LINE IS TAKEN OUT OF SERVICE UNTIL THE EXISTING HYDRANTS ARE REMOVED.
3. ALL EXISTING HYDRANTS AND HYDRANT VALVES SHALL BE REMOVED AND TURNED OVER TO THE OWNER. EXISTING WATER MAIN SHALL BE PLUG/CAPPED AND HOLE BACKFILLED TO MATCH ADJACENT SURFACE I.E. CONCRETE, ASPHALT, GRASS.

ORANGE POLYPROPYLENE NOT IN SERVICE HYDRANT BAG DETAIL
NOT TO SCALE

STATE OF KENTUCKY
DAVID E. GERNANT
22705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: AS NOTED

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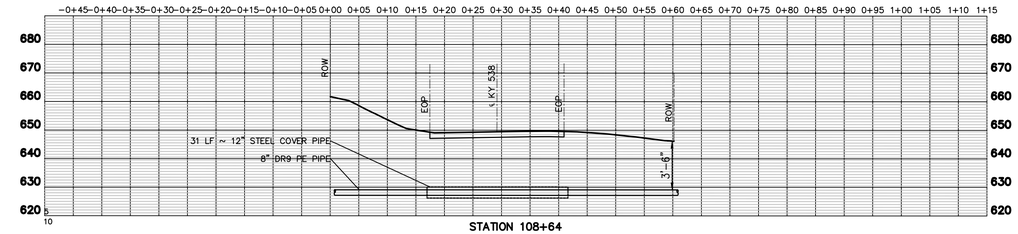
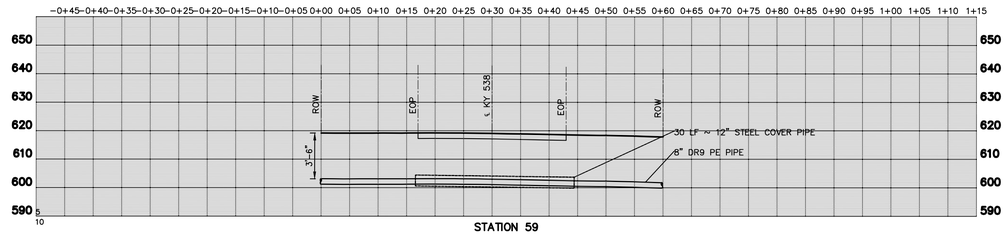
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

MISCELLANEOUS DETAILS

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	15 OF 17



STATION 108+64



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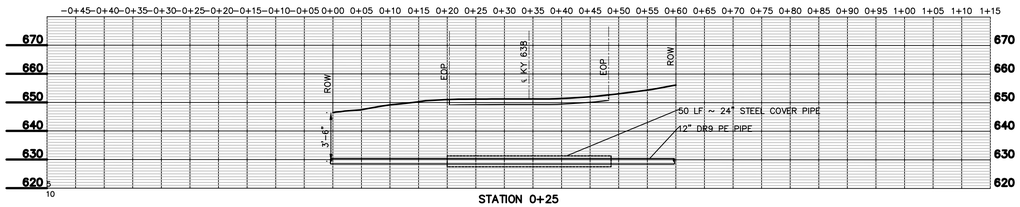
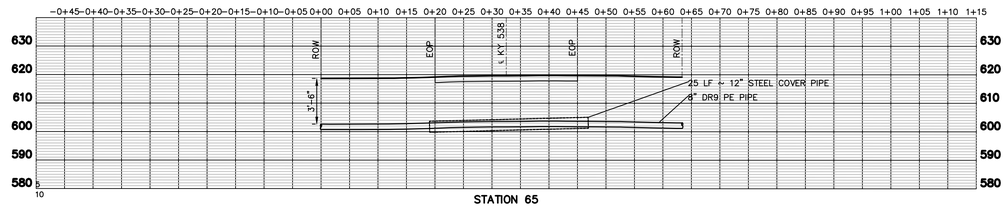


STATION 0+25



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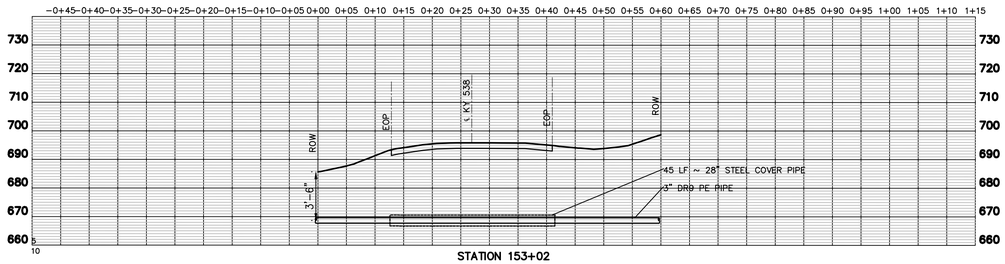
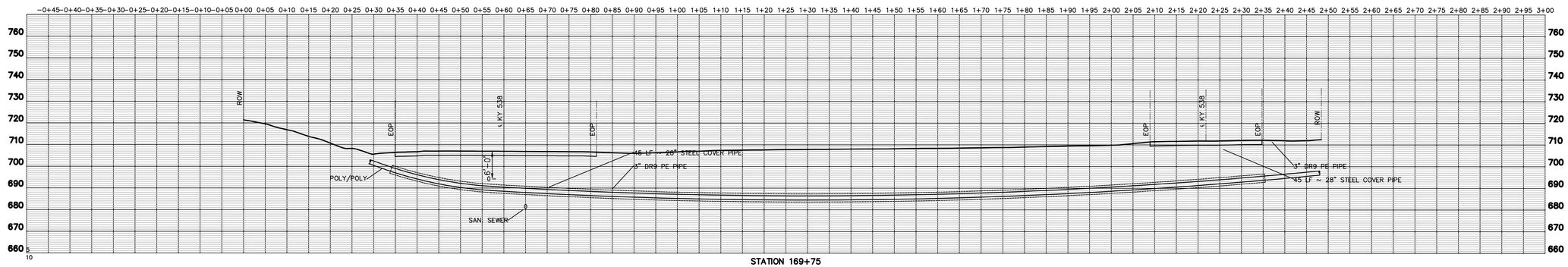


STATION 153+02



STATION 169+75

STATE OF KENTUCKY
DWIGHT E. GERNERT
20705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

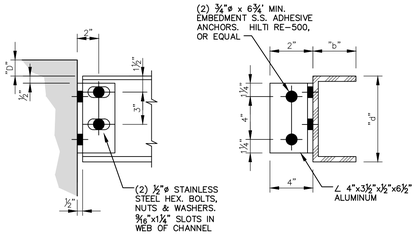
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

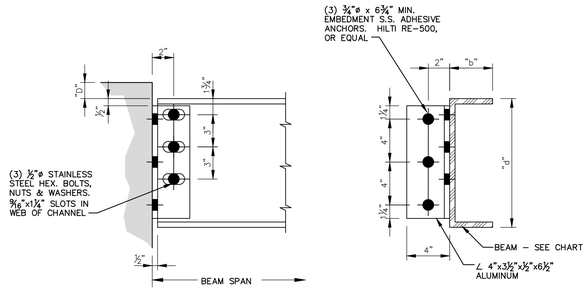
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

PIPELINE ROAD CROSSING SECTIONS

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	16 OF 17



GRATING SUPPORT BEAM CONNECTION TYPE 1



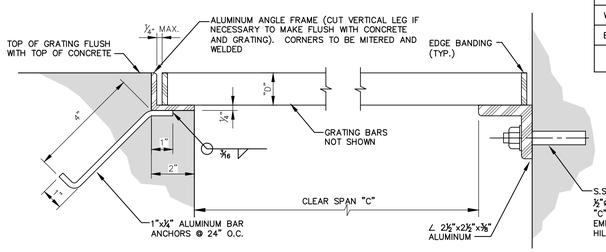
GRATING SUPPORT BEAM CONNECTION TYPE 2

DATA APPLIES UNLESS NOTED OTHERWISE

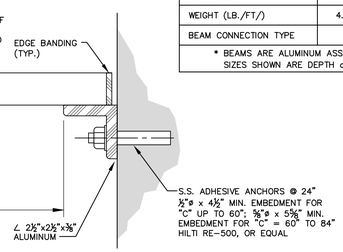
GRATING SUPPORT BEAM CHART

BEAM SPAN (FEET)	6	8	10	12	14
BEAM SIZE *	C6 x 3.25	C8 x 3.75	C10 x 4.25	C12 x 5.0	C12 x 5.0
WEIGHT (LB./FT/)	4.030	5.789	8.360	11.822	11.822
BEAM CONNECTION TYPE	1	1	2	2	2

* BEAMS ARE ALUMINUM ASSOCIATION STANDARD CHANNELS. SIZES SHOWN ARE DEPTH d x FLANGE WIDTH b.



EMBEDDED SUPPORT



SURFACE MOUNTED SUPPORT

ALUMINUM GRATING DETAILS

NOT TO SCALE

DATA APPLIES UNLESS NOTED OTHERWISE

GRATING SCHEDULE

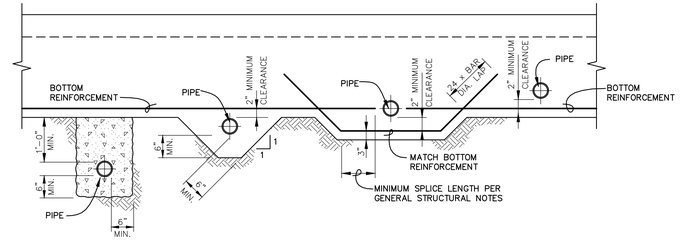
SPAN	DEPTH (MIN.)
0'–0" TO 3'–0"	1"
3'–0" TO 4'–0"	1¼"
4'–0" TO 4'–6"	1½"
4'–6" TO 5'–0"	1¾"
5'–0" TO 5'–6"	2"
5'–6" TO 6–0"	2¼"
6'–0" TO 6'–6"	2½"

GRATING SHALL NOT SPAN MORE THAN 6'–6" UNLESS SPECIAL PROVISION IS MADE BY THE ENGINEER.

NOTE

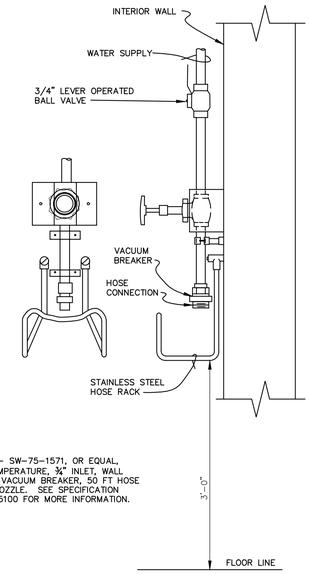
UNLESS OTHERWISE NOTED, GRATING SHALL BE ALUMINUM I–BAR TYPE WITH MINIMUM 3/16" BEARING BARS SPACED NOT MORE THAN 1 3/16" C/C AND CROSS BARS SPACED NOT MORE THAN 4" C/C.

COORDINATE SCHEDULE WITH STRUCTURE PLANS. PROVIDE SAME DEPTH WHERE REQUIRED TO MATCH ADJACENT SPANS IN SAME OR ADJOINING STRUCTURES



PIPE PERPENDICULAR TO GRADE BEAM OR FOOTING

NOT TO SCALE

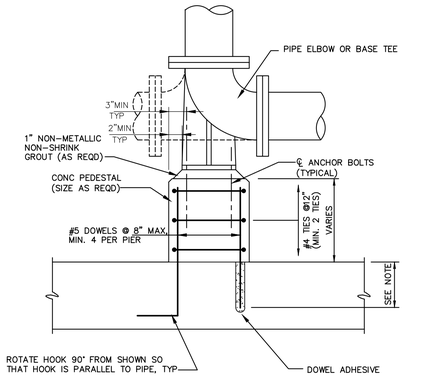


NOTE:

LEONARD – SW–75–1571, OR EQUAL, SINGLE TEMPERATURE, ¾" INLET, WALL MOUNTED, VACUUM BREAKER, 50 FT HOSE & HOSE NOZZLE. SEE SPECIFICATION SECTION 15100 FOR MORE INFORMATION.

SINGLE TEMPERATURE HOSE STATION (BLENDING HOSE STATION SIMILAR)

NOT TO SCALE

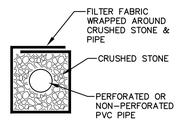


NOTE:

DOWELS MAY BE CAST IN WITH 90° HOOK OR ANCHORED WITH DOWEL ADHESIVE AT CONTRACTORS OPTION. WHEN DOWEL ADHESIVE IS USED, EMBED TO DEVELOP 125 PERCENT OF YIELD STRENGTH OF DOWELS.

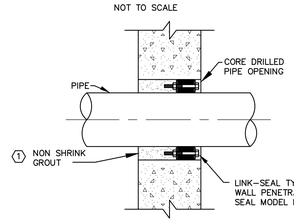
SUPPORT PIER UNDER BASE ELBOW OR BASE TEE

NOT TO SCALE

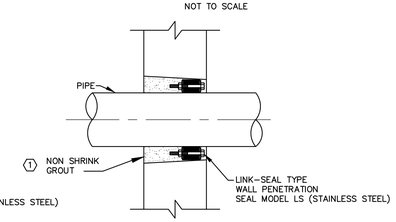


DETAIL – DRAINAGE CARRIER PIPE CONNECTING SECTIONS OF PIPE NOT ALONGSIDE STRUCTURES

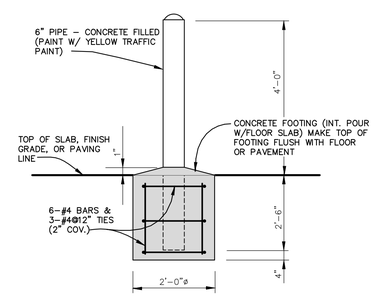
NOT TO SCALE



CORE PIPE OPNG. IN NEW OR EXISTING WALL OR SLAB

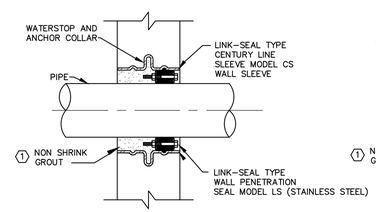


BOX–OUT PIPE OPNG. IN NEW WALL OR SLAB

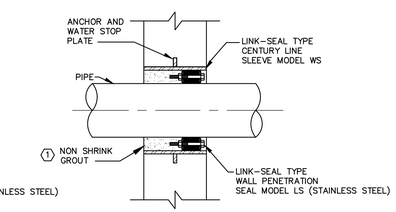


DETAIL – GUARD POST

NOT TO SCALE



WALL SLEEVE IN NEW WALL OR SLAB

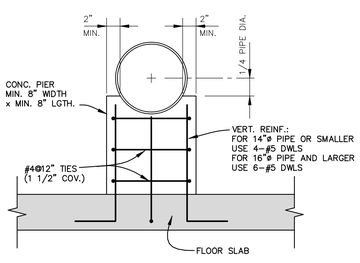


WALL SLEEVE IN NEW WALL OR SLAB
(NOT TO BE USED IN WATER HOLDING BASIN)

1 WHERE LINK–SEALS ARE CALLED FOR GROUT SHALL NOT BE USED UNLESS THE CAVITY LEAKS WATER AND ALL POSSIBLE ADJUSTMENTS TO THE LINK–SEAL(S) HAVE BEEN MADE. IF THE CAVITY IS FOUND TO LEAK WATER PRIOR TO OR DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL ADJUST LINK–SEAL(S) TO FIX THE PROBLEM. IF IT IS DETERMINED THAT THE LINK– SEAL ALONE CANNOT ELIMINATE THE LEAKING, THE CONTRACTOR SHALL PLACE NON–SHRINK GROUT IN THE CAVITY AS SHOWN.

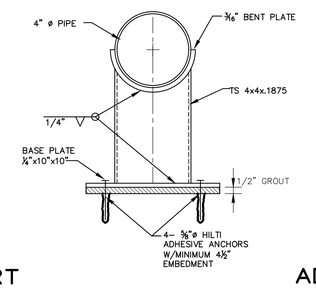
PIPE PENETRATION THROUGH CONCRETE WALLS AND SLABS

NOT TO SCALE



TYPICAL CONCRETE PIPE SUPPORT PIER TO CONCRETE FLOOR

NOT TO SCALE



PIPE SUPPORT

NOT TO SCALE

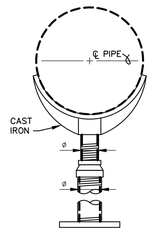
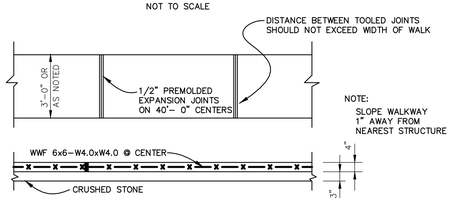


FIG. 264, A PRODUCT OF GRINNELL, OR EQUAL

ADJUSTABLE PIPE SADDLE SUPPORT

NOT TO SCALE



NOTE:
SLOPE WALKWAY 1" AWAY FROM NEAREST STRUCTURE

TYPICAL EXTERIOR WALKS NOT CANTILEVERED FROM STRUCTURES

NOT TO SCALE

STATE OF KENTUCKY DAVID E. GERNERT 20703 LICENSED PROFESSIONAL ENGINEER
11-12-24

		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

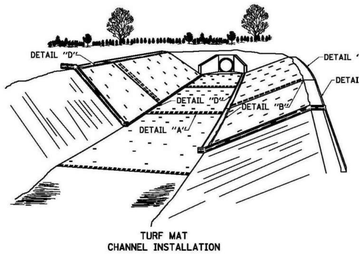
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278–5412
Hopkinsville, KY (270) 886–5466
Somerset, KY (606) 485–4011

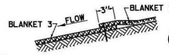
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

MISCELLANEOUS DETAILS

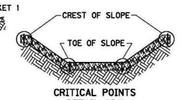
DIVISION	–
CONTRACT NO.	691–21–01
DATE	SEPTEMBER 2021
SHEET NO.	17 OF 17



TURF MAT
CHANNEL INSTALLATION

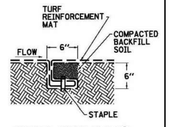


PROFILE VIEW
DETAIL "A"

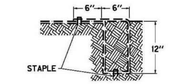


CRITICAL POINTS
DETAIL "D"

CROSS SECTION VIEW
DETAIL "B"



CHANNEL CHECK SLOT ③



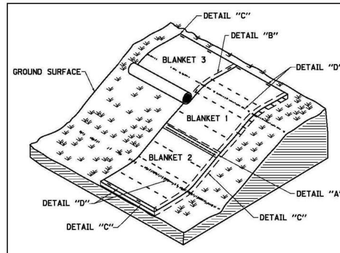
PROFILE VIEW
DETAIL "C"

NOTES

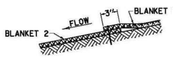
1. CONSTRUCT A 6" X 12" ANCHOR TRENCH AT THE BEGINNING OF THE CHANNEL. LINE THE ANCHOR TRENCH WITH TURF REINFORCING MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE MAT PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. DO NOT STRETCH OR ALLOW THE MATERIAL TO BRIDGE OVER SURFACE INCONSISTENCIES.
③ EXCAVATE 6" X 6" CHECK SLOTS EVERY 25' ALONG THE LENGTH OF THE CHANNEL. LINE THE SIDE AND BOTTOM OF THE SLOT WITH THE MAT AND THEN PULL BACK OVER. FASTEN WITH STAPLES ON 12" CENTERS. FILL THE CHECK SLOT WITH TOPSOIL, COMPACT, AND CONTINUE UNROLLING MAT DOWN THE CHANNEL.
4. CONTINUE UNROLLING THE MAT DOWNSTREAM OVER THE COMPACTED SLOT TO NEXT CHECK SLOT OR TERMINAL ANCHOR TRENCH. IF MORE THAN ONE SECTION OF MAT IS USED OVERLAP UPSTREAM MAT'S OVER TOP OF THE DOWNSTREAM MAT 3" AND SECURE STAPLES ON 12" CENTERS.
5. SECURE MATS WHILE UNROLLING ON SIDESLOPES AND CHANNEL BOTTOMS WITH STAPLES AT A FREQUENCY THE TABLE INDICATES. USE STAPLES HAVING SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
6. APPLY SEEDING AND PROTECTION ACCORDING TO SECTION 212.03.03 USING SEED MIX TYPE I, DIRECTLY AFTER APPLYING SEEDING AND TREATMENTS IN 212.03.03, BUT BEFORE APPLYING MULCHING OR HYDROMULCHING. INFILL THE VOID SPACES IN THE MAT WITH 1/2" OF TOPSOIL. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

SLOPE GRADE	ANCHORING FREQUENCY
UP TO 2½:1V	1.5 ANCHORS/SQUARD YARD
2½:1V TO 1½:1V	2.0 ANCHORS/SQUARE YARD
STEEPER THAN 1½:1V AND CHANNEL BOTTOMS	3.0 ANCHORS/SQUARE YARD

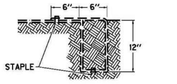
KENTUCKY
DEPARTMENT OF HIGHWAYS
TURF MAT
CHANNEL
INSTALLATION
STANDARD DRAWING NO. RDI-041
SUBMITTED: DIRECTOR OF DESIGN 12-2-11 DATE
APPROVED: CHIEF ENGINEER 12-2-11 DATE



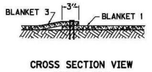
TURF MAT
SLOPE INSTALLATION



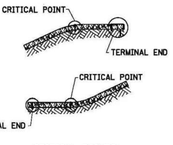
PROFILE VIEW
DETAIL "A"



PROFILE VIEW
DETAIL "C"



CROSS SECTION VIEW
DETAIL "B"

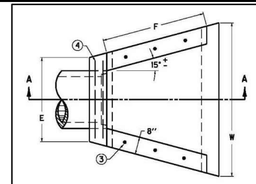


CRITICAL POINTS
DETAIL "D"

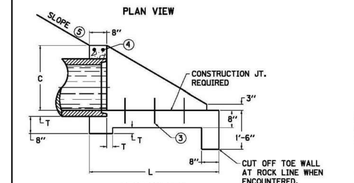
NOTES

1. CONSTRUCT A 6" X 12" ANCHOR TRENCH AT THE BEGINNING OF THE SLOPE. LINE THE ANCHOR TRENCH WITH TURF REINFORCING MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE MAT PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. DO NOT STRETCH OR ALLOW THE MATERIAL TO BRIDGE OVER SURFACE INCONSISTENCIES.
3. SECURELY FASTEN THE MAT TO THE SOIL BY INSTALLING STAPLES AT A MINIMUM RATE OF 1.5 PER SQ. YD. ANCHORS SHALL BE SELECTED SO THAT THEY HAVE SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY FOR SITE CONDITIONS (LOOSE, SANDY, OR WET SOILS) AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
4. OVERLAP EDGES OF PARALLEL AND PERPENDICULAR BLANKETS ALONG THE SLOPE A MINIMUM OF 3" AND SECURE WITH STAPLES AT A MAXIMUM SPACING OF 1'.
5. CONSTRUCT A 6"X 12" ANCHOR TRENCH AT THE TOE OF THE SLOPE FOLLOWING SIMILAR PROCEDURE DENOTED FOR THE TOP OF THE SLOPE ANCHOR TRENCH.
6. ENSURE THAT THE MAT IS IN DIRECT CONTACT WITH THE SOIL SURFACE WITH NO PROJECTIONS OR PROTRUSIONS.
7. APPLY SEEDING AND PROTECTION ACCORDING TO SECTION 212.03.03 USING SEED MIX TYPE I, DIRECTLY AFTER APPLYING SEEDING AND TREATMENTS IN 212.03.03, BUT BEFORE APPLYING MULCHING OR HYDROMULCHING. INFILL THE VOID SPACES IN THE MAT WITH 1/2" OF TOPSOIL. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

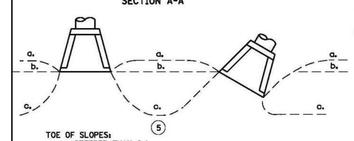
KENTUCKY
DEPARTMENT OF HIGHWAYS
TURF MAT
SLOPE
INSTALLATION
STANDARD DRAWING NO. RDI-040
SUBMITTED: DIRECTOR OF DESIGN 12-2-11 DATE
APPROVED: CHIEF ENGINEER 12-2-11 DATE



PLAN VIEW



SECTION A-A

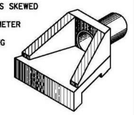


TOE OF SLOPES:
a. STEEPER THAN 2:1
b. 2:1
c. FLATTER THAN 2:1

PIPE DIA. OR EQUIV. DIA.	SHAPE ⑤	DIMENSIONS C	E	F	L	W	T	CLASS A CONC C. Y.	REINF STEEL LBS.
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7
15"	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"	2¼"	0.75	
	◯	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"		0.68	
18"	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2½"	0.93	8
	◯	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"	2¾"	0.89	
21"	○	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"		1.14	
	◯	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"		1.07	9
24"	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	1.35	8
	◯	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3¼"	1.30	9
27"	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"		1.57	
	◯	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3½"	1.51	10

NOTES

1. DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.
2. REINFORCING STEEL : MINIMUM GRADE 40, BARS EVENLY SPACED.
③ 6 - NO. 4 x 1'-0" DOWEL BARS.
④ 2 - NO. 4 x (E DIMENSION MINUS 4").
⑤ SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.
6. VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
7. WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
8. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
⑨ HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"- 27" EQUIVALENT PIPE SIZES. SEE CURRENT STD. DWG. RDI-016, FOR NON-CIRCULAR PIPE EQUIVALENT SIZES.



ISOMETRIC VIEW

KENTUCKY
DEPARTMENT OF HIGHWAYS
SLOPED & FLARED
HEADWALLS FOR
12" TO 27" PIPE
STANDARD DRAWING NO. RDH-020-03
SUBMITTED: DIRECTOR OF DESIGN 12-1-99 DATE
APPROVED: CHIEF ENGINEER 12-1-99 DATE

GENERAL NOTES FOR EROSION PREVENTION AND SEDIMENT CONTROL

THE CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (NOI) FORM TO THE KENTUCKY DIVISION OF WATER AT LEAST 48 HOURS BEFORE ANY CONSTRUCTION BEGINS.

AT THE SAME TIME THE CONTRACTOR SHALL SUBMIT A COPY OF THE NOI TO THE LOCAL MUNICIPALITY.

THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A "STORM WATER POLLUTION PREVENTION PLAN OR BEST MANAGEMENT PRACTICES PLAN (BMP)" AND KEEP A COPY OF THE PLAN ON SITE. THE CONTRACTOR SHALL USE SPECIFICATION SECTION 02370 – EROSION PREVENTION AND SEDIMENT CONTROL – AS A STARTING POINT AND MODIFY THIS INFORMATION AS NEEDED FOR ACTUAL SITE CONDITIONS. THE PLAN SHALL BE PREPARED ACCORDING TO THE CURRENT EDITION OF THE "KENTUCKY EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE" (KEPSCFG). A COPY OF THE DETAILED EROSION CONTROL PLAN, WHICH HAS BEEN PREPARED BY THE CONTRACTOR, SHALL BE SUBMITTED TO THE MUNICIPALITY AND THE ENGINEER FOR REVIEW AT LEAST 48 HOURS PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES.

ALL STORM DRAINS THAT DISCHARGE INTO A DRAINAGE CHANNEL, STREAM, LAKE, ETC., AND NOT ONTO AN OPEN FIELD SHALL HAVE AN INLET SEDIMENT CONTROL DEVICE INSTALLED DURING CONSTRUCTION. THE DEVICE SHALL BE SIMILAR TO THE SILTSACK AS MANUFACTURED BY ACF ENVIRONMENTAL OR DANDY BAG II BY DANDY PRODUCTS, OR EQUAL.

ROCK CHECKS SHALL BE USED TO TRAP SEDIMENT TRAVELING ALONG DRAINAGE CHANNELS, ETC., STRAW BALES ARE NOT ACCEPTABLE.

ANY CONSTRUCTION ACCESS ROAD, ETC., THAT JOINS ANY PAVED DRIVEWAY, OR ROAD SHALL HAVE A CRUSHED STONE ENTRANCE CREATED ACCORDING TO THE DRAWINGS AND THE KENTUCKY "EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE".

STORM WATER RUNOFF FROM UNDISTURBED AREAS SHALL BE DIVERTED AROUND CONSTRUCTION SITES BY THE USE OF DIVERSION BERMS OR DIVERSION DITCHES.

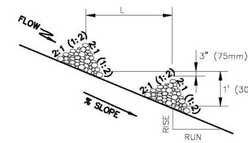
SILT FENCES SHALL BE USED TO TRAP SEDIMENT FROM SEDIMENT LADEN STORM WATER ROLLING DOWN HILLS, ETC., ACCORDING TO THE DRAWINGS AND THE KENTUCKY "EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE".

ANY PLACE WHERE THE SOIL HAS BEEN DISTURBED AND MAY SEE PERIODS OF 21 DAYS OR LONGER WITHOUT DISTURBANCE SHALL BE PROTECTED FROM EROSION BY THE USE OF GRASS SEED AND MULCH, EROSION CONTROL BLANKETS, ETC., AS SPECIFIED IN THE KENTUCKY "EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE". THE TYPE OF GRASS SEED TO BE USED, ETC., SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS OR IF NOT SPECIFIED SHALL BE BY THE KEPSCFG.

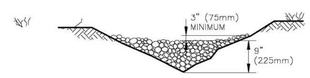
WHEN SILT FENCES AND OTHER SEDIMENT TRAPPING DEVICES BECOME FULL THEY SHALL BE CLEANED OUT TO NEAR NEW INSTALLATION CONDITIONS AND PUT BACK INTO SERVICE.

ANY DISTURBED AREA WITH A SLOPE OF 3:1 OR GREATER SHALL BE PROTECTED BY TURF REINFORCEMENT MATS AS DETAILED ON DRAWINGS.

ALL DRAINAGE DITCHES ARE TO BE PROTECTED BY TURF REINFORCEMENT MATS AS DETAILED ON DRAWINGS.



SECTION "A"



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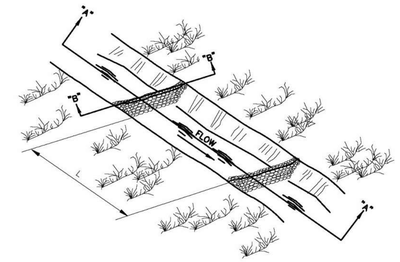


PLAN

NOTE:

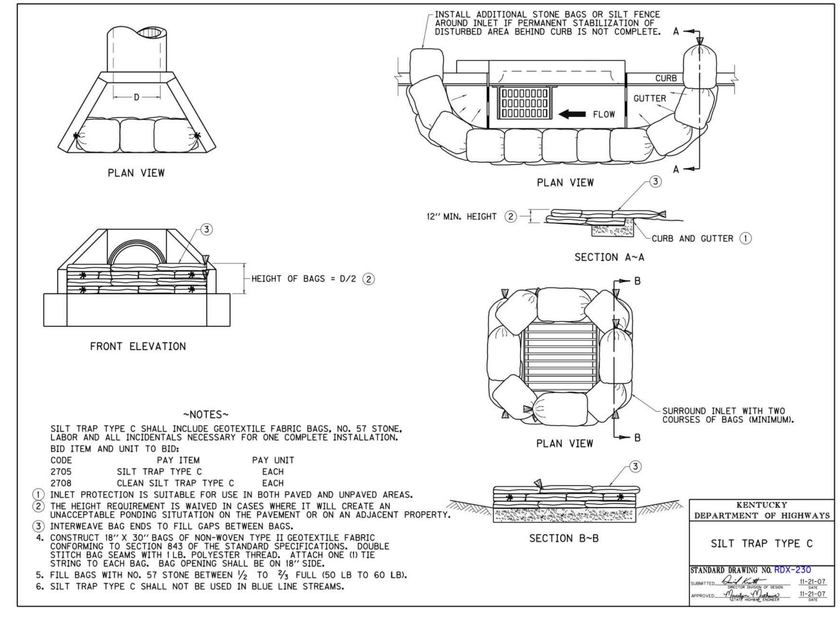
SPACING OF PREFABRICATED DITCH CHECKS SHALL BE THE SAME AS STONE DITCH CHECKS.

THE MINIMUM DITCH DEPTH IS 1' (300mm)

STONE SHALL BE ACCORDING TO THE "EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE"

L=PER KENTUCKY DIVISION OF WATER KPDES DIVISION "EROSION PERVENTION AND SEDIMENT CONTROL FIELD GUIDE".

SPACING OF DITCH CHECKS
N.T.S.



~NOTES~

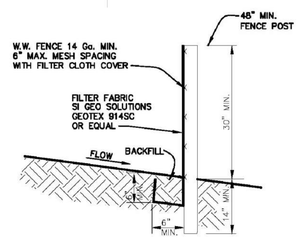
SILT TRAP TYPE C SHALL INCLUDE GEOTEXTILE FABRIC BAGS, NO. 57 STONE, LABOR AND ALL INCIDENTALS NECESSARY FOR ONE COMPLETE INSTALLATION.

BID ITEM AND UNIT TO BID:

CODE	PAY ITEM	PAY UNIT
2705	SILT TRAP TYPE C	EACH
2708	CLEAN SILT TRAP TYPE C	EACH

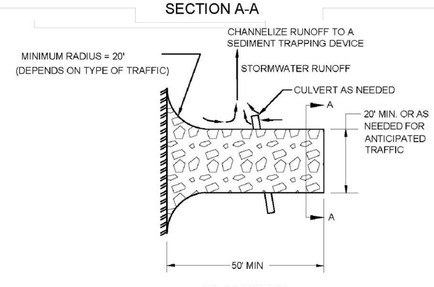
1 INLET PROTECTION IS SUITABLE FOR USE IN BOTH PAVED AND UNPAVED AREAS.
2 THE HEIGHT REQUIREMENT IS WAIVED IN CASES WHERE IT WILL CREATE AN UNACCEPTABLE PONDING SITUATION ON THE PAVEMENT OR ON AN ADJACENT PROPERTY.
3 INTERWEAVE BAG ENDS TO FILL GAPS BETWEEN BAGS.
4. CONSTRUCT 18" X 30" BAGS OF NON-WOVEN TYPE II GEOTEXTILE FABRIC CONFORMING TO SECTION 843 OF THE STANDARD SPECIFICATIONS. DOUBLE STITCH BAG SEAMS WITH 1 LB. POLYESTER THREAD. ATTACH ONE (1) TIE STRING TO EACH BAG. BAG OPENING SHALL BE ON 18" SIDE.
5. FILL BAGS WITH NO. 57 STONE BETWEEN ½ TO ⅔ FULL (50 LB TO 60 LB).
6. SILT TRAP TYPE C SHALL NOT BE USED IN BLUE LINE STREAMS.

KENTUCKY
DEPARTMENT OF HIGHWAYS
SILT TRAP TYPE C
STANDARD DRAWING NO. RDX-230
SUBMITTED: DIRECTOR OF DESIGN 11-21-07 DATE
APPROVED: CHIEF ENGINEER 11-21-07 DATE



SECTION

SILT FENCE
N.T.S.



PLAN VIEW

CONSTRUCTION ENTRANCE

1. STONE SIZE - TWO-INCH STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FT.
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 IN. THICK.
4. WIDTH - THE ENTRANCE SHALL BE AT LEAST 20 FT. WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. BEDDING - A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB.
6. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
8. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

STATE OF KENTUCKY
DAVID EGE GERNANY
22705
LICENSED
PROFESSIONAL ENGINEER
11-12-24

DESIGNER	DEG	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

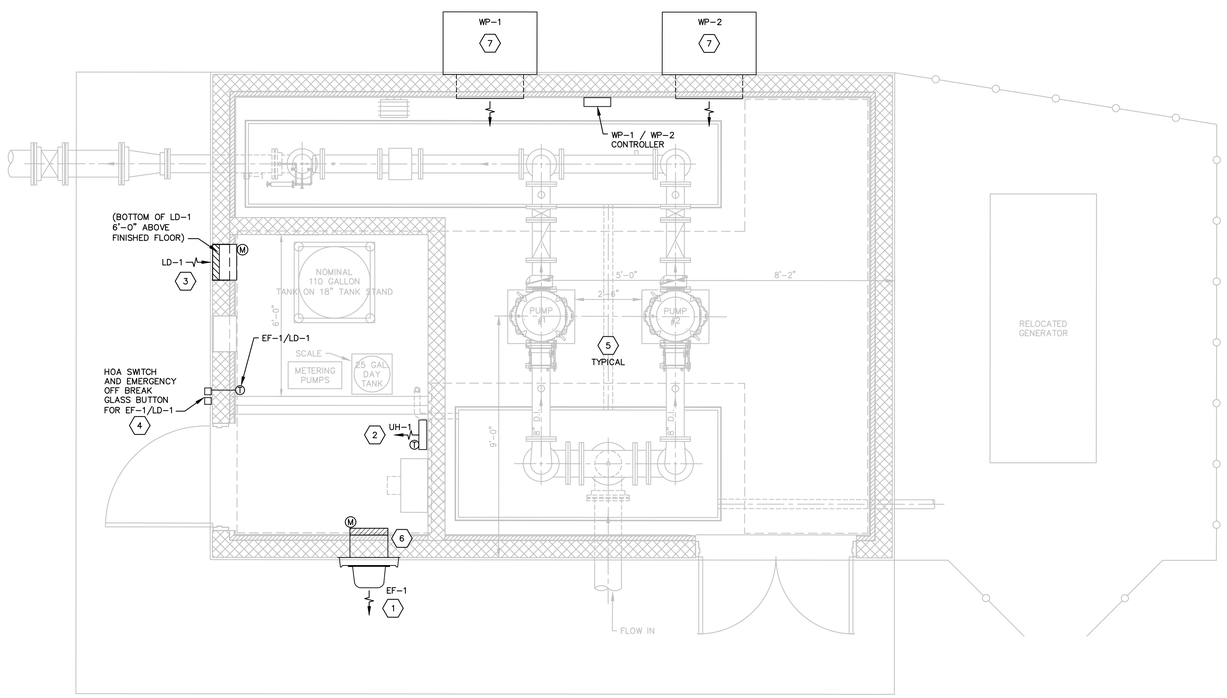
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

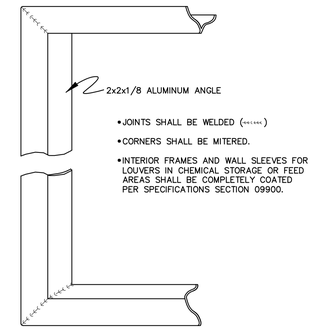
EROSION CONTROL

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	EC1 OF EC1



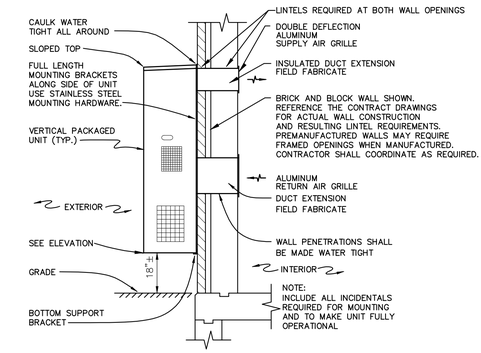
BOOSTER PUMP STATION HVAC PLAN

3/8" = 1'-0"



INTERIOR PERIMETER FRAME FOR WALL LOUVERS

NOT TO SCALE



VERTICAL PACKAGED UNIT DETAIL

NOT TO SCALE

(X) HVAC NOTES:

1. EXHAUST FAN EF-1, FULL WALL SLEEVE, MOTORIZED BACKDRAFT DAMPER REQUIRED, POWER OPEN, SPRING CLOSE. TRIM ALL AROUND INTERIOR OF ROUGH CUT OPENING. TWIN CITY FIBER AIR (SWARTWOUT) MODEL 12SA2, 531 CFM AT 3/8" SP, 1/8 HP, 1140 RPM, 120V/1P FAN. DAMPER JUST INSIDE ROOM IN WALL SLEEVE EXTENSION.
2. UNIT HEATER UH-1 SHALL HAVE INTEGRAL THERMOSTAT (50 TO 90F) AND CONTACTORS. MARKEL MODEL 3420. IT SHALL BE 4,000 WATT (240V / 1 PHASE).
3. COMBINATION LOUVER/DAMPER LD-1 SHALL HAVE FULL WALL SLEEVE AND INTERIOR PERIMETER FRAME AROUND ROUGH OPENING. RUSKIN MODEL ELC6375DAX, 16" WIDE X 24" HIGH, 531 CFM AT 0.05 SP, 6" DEEP ALUMINUM FRAME, RECESSED WITH EXTENDED SILL, INSECT SCREEN, 0.9 SF FREE AREA, 593 FPM VELOCITY. KYNAR COLOR SELECTION DURING SHOP DRAWING REVIEW.
4. CONTROLS FOR EF-1/LD-1: INTERIOR CHROMOLOX WCRT THERMOSTAT (COOLING), HOA SWITCH AND ALLEN BRADLEY BREAK GLASS EMERGENCY OFF SWITCH ON OUTSIDE WALL, BOTH TO BE WATER PROOF OR HAVE WATERPROOF COVERS.
5. SEE ELECTRICAL DRAWINGS FOR FINAL REQUIRED VOLTAGE/PHASE OF UH-1, EF-1, LD-1, AND MOTORIZED BACKDRAFT DAMPERS AT EF-1 AND LD-1.
6. FULL WALL SLEEVE WITH DAMPER EXTENSION INTO ROOM AND A POWER OPEN SPRING RETURN DAMPER MOTOR. BOTTOM OF EF-1 WALL OPENING AT 2 FT AFF.
7. COORDINATE WITH PRIME CONTRACTOR TO ENSURE THAT SMOOTH FACE BLOCK IS INSTALLED WHERE THE WP UNIT(S) WILL BE MOUNTED ON THE EXTERIOR WALL. VERIFY SIZE AND LOCATION OF MOUNTING AREA FOR SMOOTH FACE BLOCK USING APPROVED SHOP DRAWING. NO SMOOTH FACE BLOCK SHALL BE VISIBLE AFTER THE WP UNIT(S) HAS BEEN INSTALLED.

WALL MOUNTED AC UNIT

TAG	LOCATION OR AREA SERVED	MANUFACTURER	MODEL (INDOOR / OUTDOOR)	CFM	EXTERNAL STAT. PRESS (INCHES)	COOLING TOTAL/SENSIBLE (MBH)	HEAT PUMP HEATING (MBH)	SUPP. ELEC. HEAT (KW)	SEER / EER	VOLT / PHASE	REMARKS	WEIGHT (LBS)
WP - 1	BOOSTER PUMP STATION	MARVAIR	MAA 2060 AD (2 STAGE)	1,800	0.25	54 / 36.5	0.0	6.0	NA / 11	480 / 3	1, 2, 3, 4, 5	545
WP - 2	BOOSTER PUMP STATION	MARVAIR	MAA 2060 AD (2 STAGE)	1,800	0.25	54 / 36.5	0.0	6.0	NA / 11	480 / 3	1, 2, 3, 4, 5	545

GENERAL COMMENTS: See remarks below. UNITS REQUIRE 2 STAGE COMPRESSORS, LOW AMBIENT CONROL, AND FULL FLOW ENTHALPY CONTROLLED ECONOMIZER.

SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. ALTERNATE MANUFACTURERS WILL BE CONSIDERED. PROOF OF EQUALITY IS THE CONTRACTOR'S RESPONSIBILITY.
INSTALL ENGRAVED EQUIPMENT TAGS (BLACK TEXT ON WHITE BACKGROUND) ON ALL MAJOR EQUIPMENT AND ASSOCIATED CONTROLS.
COOLING PERFORMANCE DESIGN CONDITIONS: 95F OUTDOOR, 80F DB / 67F WB INDOOR. HEAT PUMP HEATING PERFORMANCE DESIGN CONDITIONS: 17F OUTDOOR, 70F DB INDOOR.
VERIFY WEIGHTS AND DIMENSIONS WITH EQUIPMENT FROM FINAL ACCEPTED SHOP DRAWINGS. PROVIDE STRUCTURAL SUPPORT AND FRAMING FOR WALL MOUNTED EQUIPMENT AS REQUIRED.
FOR EACH UNIT NOTED ABOVE, A FULL FLOW ECONOMIZER WITH ENTHALPY CONTROL, DAMPER CONTROLLED AIR MIXING, AND INTERNAL PRESSURE RELIEF IS REQUIRED.
FOR INSTALLATION INTO NEW BLOCK WALLS WITH BOND BEAMS, IF WALL REINFORCEMENT IS INTERRUPTED, OFFSET IT ABOVE OR BELOW THE WALL OPENING TO ENSURE IT REMAINS CONTINUOUS.
FOR INSTALLATION ONTO SPLIT FACE BLOCK WALLS, INSTALL SMOOTH FACE BLOCK WHERE UNIT AND MOUNTING FLANGES WILL BE TO MAKE A SECURE AND GAP FREE CONNECTION. SMOOTH FACE BLOCK FOR MOUNTING SHALL NOT EXTEND GREATER THAN 2 INCHES BEYOND THE MOUNTING PERIMETER OF THE UNIT.

REMARKS:

1. VERTICAL PACKAGED WALL MOUNT UNIT WITH: LOW AMBIENT PACKAGE (FOR OPERATION DOWN TO 20 DEGREES F.), DELUXE ALUMINUM SUPPLY AND RETURN GRILLES, 4 FACTORY FILTERS, BLANK OFF PLATE TO RESTRICT OUTSIDE AIR UNLESS ECONOMIZER IS NOTED, TIME DELAY, THERMAL EXPANSION VALVE, ANTI SHORT CYCLE TIMER, HIGH PRESSURE SWITCH, LOSS OF CHARGE, UTILIZE R-410a REFRIGERANT, LOCKOUT RELAY, TIMED LOW PRESSURE BYPASS, WALL SLEEVE, FACTORY INSTALLED DISCONNECT, COLOR SELECTION DURING SHOP DWG. REVIEW, SCROLL COMPRESSOR, SINGLE POINT POWER ENTRY, SLOPED TOP, STAINLESS MOUNTING HARDWARE. CHECKLIST, TEST, AND STARTUP WITH A WRITTEN REPORT TO ENGINEER SHALL BE PERFORMED BY A TECHNICIAN FROM THE MANUFACTURER'S REPRESENTATIVE AND SHALL BE INCLUDED IN THE BID PRICE.
2. UNIT SHALL HAVE A DIRTY FILTER INDICATOR, STAINLESS STEEL FASTNERS & DRAIN PAN, THERMAL EXPANSION VALVE, LOW AMBIENT CONTROL WITH FAN CYCLE CONTROL AND EVAP FREEZE SENSOR
3. VERTICAL PACKAGED WALL MOUNTED UNIT SHALL HAVE BUILT-IN FACTORY INSTALLED ECONOMIZER WITH USER ADJUSTABLE ENTHALPY CONTROLLER, INTEGRAL PRESSURE RELIEF, AND MIXED AIR SENSOR TO MODULATE DAMPER FOR CORRECT MIX OF RETURN AND OUTDOOR AIR TO MAINTAIN A 50 TO 63 DEGREED F SUPPLY.
4. VERTICAL PACKAGED WALL MOUNTED UNIT SHALL HAVE **2 STAGESCROLL COMPRESSOR WITH FIRST STAGE COOLING APPROXIMATELY 65%** OF THE TOTAL COOLING CAPACITY.
5. THE MANUFACTURER'S COMMSTAT 4 TELECOM HVAC CONTROLLER CAPABLE OF CONTROLLING UP TO 2 UNITS, EACH WITH A 2 STAGE COMPRESSOR AND FULL FLOW ECONOMIZER IS REQUIRED INCLUDING FURNISHING AND INSTALLING CONDUIT AND WIRE FOR REMOTE SENSORS.

11 / 13 / 2024

STATE OF KENTUCKY
JOHN D. PRINCE
22565
LICENSED
PROFESSIONAL ENGINEER
11-13-24

		DATE	BY	REVISION
DESIGNER	JDP			
DRAWN	TEW			
CHECKED	JDP			
APPROVED	JDP			

GRAPHIC SCALE

SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

BOOSTER PUMP STATION
HVAC PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	M1 OF M1

ABBREVIATION OR ACRONYM	DESCRIPTION
A	AMPERE
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR OR DECK TO CENTERLINE
AFC	AUTOMATIC FREQUENCY CONTROL (ALSO SEE VFD)
AHU	AIR HANDLING UNIT
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
ATRV	AUTOTRANSFORMER REDUCED–VOLTAGE
BC	BARE COPPER
C	CONDUIT (RACEWAY)
@	AT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
C/L	CENTERLINE
CLG	CEILING
CTL	CONTROL
CU	COPPER OR IN HVAC CONTEXT 'CONDENSING UNIT'
Δ/Y	DELTA/WYE
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER
DB	DIRECT BURIAL
DN	DOWN
DP\ST	DOUBLE POLE–SINGLE THROW
EC	EMPTY CONDUIT
EF	EXHAUST FAN
EG	EQUIPMENT GROUND
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
EOL	END–OF–LINE
EMERG	EMERGENCY
EM#	EMERGENCY LIGHT
ES	EMERGENCY SOLENOID
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WALL HEATER OR WATER HEATER
EX	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FTG	FITTING
FOR	'FORWARD–OFF–REVERSE' SELECTOR SWITCH
FS	FLOAT SWITCH
FSS	FUSED SAFETY SWITCH
FVNR	FULL VOLTAGE, NON–REVERSING
GEN	GENERATOR
GFCI	GROUND FAULT CURRENT INTERRUPTING
GND	GROUND
GNDG	GROUNDING
HOA	'HAND–OFF–AUTOMATIC' SELECTOR SWITCH
HP	HORSEPOWER
HPU	HEAT PUMP UNIT
HTC	HIGH TEMPERATURE CUTOFF
JB	JUNCTION BOX
KVA	KILOVOLT–AMPERES
KWH	KILOWATT–HOUR
KCMIL	THOUSAND CIRCULAR MILS
LF	LIGHTING FIXTURE (LUMINAIRE)
LOR	'LOCAL–OFF–REMOTE' SELECTOR SWITCH
LTG	LIGHTING
LTS	LIGHTS
LS	LIMIT SWITCH
LV	LOW VOLTAGE
LVDT	LINEAR VARIABLE DIFFERENTIAL TRANSFORMER
MATV	MASTER ANTENNA TELEVISION
MAU	MAKE UP AIR UNIT
M/C	MAGNETIC CONTRACTOR CONTROL
MCB	MAIN CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	'MAIN LUGS ONLY'
MTG HGT	MOUNTING HEIGHT
MTD	MOUNTED
MV	MEDIUM VOLTAGE
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NFSS	NON–FUSIBLE SAFETY SWITCH
NL	NON LINEAR
NO	NORMALLY OPEN
NS	NORMAL SOLENOID
NTS	'NOT TO SCALE'
OH	OVERHEAD
OL	OVERLOAD
P	POLE
PMT	PAD MOUNTED TRANSFORMER
OT	OVER TEMPERATURE
PH OR ø	PHASE
PNL	PANEL

ABBREVIATION OR ACRONYM	DESCRIPTION
PS	PRESSURE SWITCH
PVC	POLY–VINYL CHLORIDE
PWR	POWER
P/W	PLYWOOD
RECEPT	RECEPTACLE
R/C	REMOTE CONTROL
RV	RELIEF VENT
SHT	SHEET
SIG	SIGNAL
SMR	SURFACE–METAL–RACEWAY
S/N	SOLID NEUTRAL
SP	SINGLE POLE
SS	STAINLESS STEEL
SVCS	SERVICE(S)
STA	STATION
STD	STANDARD
SW	SWITCH
TEL	TELEPHONE
TM	THERMAL MAGNETIC
TS	TAMPER SWITCH
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UG	UNDERGROUND
UH	UNIT HEATER
UV	UNIT VENTILATOR
V	VOLTAGE OR VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
WP	WEATHERPROOF
W/	WITH
XFMR	TRANSFORMER

SYMBOL	DESCRIPTION
	SIGNIFIES EXISTING RACEWAY AND WIRES UNLESS OTHERWISE NOTED
	SIGNIFIES ONE HOT WIRE AND ONE NEUTRAL WIRE BACK TO A LIGHTING PANEL BOARD (120 VOLT) UNLESS OTHERWISE NOTED
	SIGNIFIES TWO HOT WIRES AND ONE NEUTRAL WIRE BACK TO A LIGHTING PANELBOARD (240 VOLT) UNLESS OTHERWISE NOTED SIGNIFIES MULTIPLE CIRCUITS IN RACEWAY
	SIGNIFIES A CONNECTION OF TWO WIRES (1–HOT, 1 NEUTRAL) BETWEEN TWO RECEPTACLES, LIGHTS, ETC., UNLESS OTHERWISE NOTED
	CONDUIT WITH PULL WIRE OR GROUND WIRE
	SIGNIFIES A CONDUIT CARRYING TWO SWITCH WIRES BETWEEN TWO 3–WAY SWITCHES AND CARRYING TWO POWER WIRES (1–HOT, 1–NEUTRAL) TO THE NEXT FIXTURE UNLESS OTHERWISE NOTED
	SIGNIFIES THREE HOT WIRES GOING TO A 3ø MOTOR CONTROL CENTER (USUALLY FROM A MOTOR OR A 3ø HEATER) UNLESS OTHERWISE NOTED SINGLE POLE SWITCH UNLESS OTHERWISE NOTED
S K	KEY OPERATED SWITCH
S P	SWITCH WITH PILOT LIGHT
S D	DIMMER SWITCH
S T	TIME SWITCH
S 3	3–WAY SWITCH
S 4	4–WAY SWITCH
S WP	WEATHERPROOF SWITCH
S M	MANUAL STARTING SWITCH WITH OL PROTECTION (FOR FRACTIONAL HP MOTORS)
	120 VOLT DUPLEX RECEPTACLE OUTLET (1–HOT AND 1–NEUTRAL WIRE)
	SWITCHED DUPLEX RECEPTACLE
WP	120 VOLT DUPLEX RECEPTACLE OUTLET–WEATHERPROOF
	120 VOLT SINGLE RECEPTACLE OUTLET
	DUPLEX RECEPTACLE, FLUSH FLOORBOX MOUNTED
	SINGLE SPECIAL PURPOSE RECEPTACLE OUTLET
	240 VOLT RECEPTACLE (2–HOT AND 1–NEUTRAL WIRE)
GFI	NOTATION "GFI" INDICATES RECEPTACLE TO BE GROUND FAULT INTERRUPTING TYPE – NOTATION "IG" INDICATES RECEPTACLE TO BE ISOLATED GROUND
	GENERIC LIGHT FIXTURE
L	KEYLESS PORCELAIN LAMP HOLDER
	GENERIC H.I.D. LIGHT FIXTURE UNLESS OTHERWISE SPECIFIED
	GENERIC H.I.D. LIGHT FIXTURE WITH RESTRIKE OPTION
	NIGHT LIGHT OR REMOTE EMERGENCY HEAD
	WALL MOUNTED, GENERIC LIGHT FIXTURE
	2 LAMP FLUORESCENT FIXTURE
	2,3,OR 4 LAMP FLUORESCENT LIGHT FIXTURE
	FLUORESCENT FIXTURE WITH BUILT–IN EMERGENCY BACKUP
	EXTERIOR LIGHT FIXTURE (WALL PACK)
	EMERGENCY LIGHT (ADJUSTABLE, DOUBLE–HEAD SHOWN)
	ILLUMINATED EXIT SIGN (UNIT WITH DIRECTIONAL ARROW SHOWN)
	PANELBOARD (SURFACE MOUNTED)
	PANELBOARD (FLUSH MOUNTED IN WALL)
	HEATER–WALL MOUNTED

SYMBOL	DESCRIPTION
T	THERMOSTAT
	MOTOR DISCONNECT SWITCH (NONFUSED SAFETY SWITCH) UNLESS OTHERWISE NOTED
AC DC M OR	MOTOR (A NUMBER SUBSTITUTED FOR THE LETTER M IN THE CIRCLE IS THE NAMEPLATE HP)
	EXPLOSION PROOF JUNCTION BOX
J OR	JUNCTION BOX – SMALL
J	JUNCTION BOX – SQUARE\RECTANGULAR – LARGE
	MAGNETIC COMBINATION STARTER
C	CCTV CAMERA OUTLET
TV	CABLE TV OR ANTENNA CABLE OUTLET
M	CCTV MONITOR OUTLET
	TELEPHONE OUTLET FLOORBOX MOUNTED
T	TELEPHONE OUTLET
	COMPUTER DATA OUTLET
	DATA OUTLET, FLOORBOX MOUNTED
G OR	GENERATOR/PHASE CONVERTER
EF	EXHAUST FAN/VENTILATOR
	COMBINATION POWER/TELEPHONE FLOORBOX
	COMBINATION DATA/POWER FLOORBOX
	CONDUIT SLEEVED THROUGH WALL
A	AMMETER
B	BELL, GENERAL
	BUZZER
V	VOLTMETER
W	WATTMETER
WH	WATT–HOUR METER
	EXPLOSION PROOF CONDUIT SEALING FITTING
	FLEXIBLE CONDUIT
	CONDUIT TURNED UP
OR	CONDUIT TURNED DOWN
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
S	SPEAKER GENERAL
C	CLOCK, SINGLE FACE
C C	CLOCK, DOUBLE FACE
	FLUORESCENT LTG. FIXTURE – CONTINUOUS ROW
L/A OR	LIGHTNING ARRESTOR
	CAPACITOR
	GROUND
	MULTI–OUTLET STRIP (PLUGMOLD)
	TRANSFORMER
	LIGHTING PANELBOARD (IN ONE–LINE OR RISER DIAGRAMS)
OR	CIRCUIT BREAKER (GENERAL), SINGLE POLE, OR A REPRESENTATION OF A 2 OR 3 POLE BREAKER ON THE ONE LINE DIAGRAM.
	RELAY CONTACTS (NORMALLY OPENED)
	RELAY CONTACTS (NORMALLY CLOSED)
	THERMAL OVERLOAD PROTECTION
	MOTOR (IN CONTROL CIRCUIT DRAWINGS)
OR	FUSE
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	AUTOMATIC TRANSFER SWITCH
	FLOAT SWITCH
	TEMPERATURE SWITCH (THERMOSTAT)
	PRESSURE SWITCH
	LIMIT SWITCH
	DOT INDICATES A CONNECTION OF TWO WIRES
1 2 1 2	INDICATES TERMINALS FOR CONNECTION OF REMOTE WIRING
R	RELAY OR CONTACTOR COIL R, CR, AR, ETC. IN THE SYMBOL
SV	SOLENOID VALVE COIL
TM	TIMER MOTOR
OR	PILOT LIGHT IN CONTROL CIRCUIT

SYMBOL	DESCRIPTION
	REMOTE LOCATION FROM STARTER
ETM OR ETM	ELAPSED TIME METER
M	MOTOR STARTER COIL
	AUTO TRANSFORMER
	TIMER CLUTCH (OR SOLENOID)
	IN CONTROL CIRCUITS INFERS MECHANICAL INTERLOCKING IN SITE PLANS AND BUILDING PLANS MAY INFER UNDERGROUND OR CONCEALED CONDUITS, HIDDEN LINES, ETC.
K	KEY INTERLOCK
	CIRCUIT BREAKER; THERMAL MAGNETIC TYPE, SINGLE POLE
	CIRCUIT BREAKER; THERMAL MAGNETIC TYPE, 2 POLE
	CIRCUIT BREAKER; THERMAL MAGNETIC TYPE, 3 POLE
	CIRCUIT BREAKER; MAGNETIC TYPE, SINGLE POLE
	BATTERY
	CIRCUIT BREAKER; MAGNETIC ONLY TYPE, 2 POLE
	CIRCUIT BREAKER; MAGNETIC ONLY TYPE, 3 POLE
	CIRCUIT BREAKER (GENERAL), 2 POLE
	CIRCUIT BREAKER (GENERAL), 3 POLE OR MOLDED CASE SWITCH
	GROUND FAULT PROTECTED CIRCUIT BREAKER, 3 POLE
	GROUND FAULT PROTECTED CIRCUIT BREAKER, ONE LINE DIAGRAM REPRESENTATION
START STOP M	START–STOP PUSHBUTTONS (NON–MAINTAINED CONTACT)
ON OFF	ON–OFF (2 POSITION) SELECTOR SWITCH
OFF ON	ON–OFF PUSHBUTTONS (MAINTAINED CONTACT)
H O A OR O H A	HAND–OFF–AUTOMATIC (OR LOCAL–OFF–REMOTE) 3 POSITION SELECTOR SWITCH
F	FORWARD POSITION
L	LOCAL POSITION
O	OFF POSITION
R	REMOTE POSITION (OR REVERSE)
H	HAND POSITION
A	AUTOMATIC POSITION
#	NUMBER OR WEIGHT
OR	EXISTING LIGHTING STANDARD
OR	NEW LIGHTING STANDARD
	EXISTING POLE MOUNTED TRANSFORMER
	NEW POLE MOUNTED TRANSFORMER
	EXISTING PAD MOUNTED TRANSFORMER
	NEW PAD MOUNTED TRANSFORMER
	EXISTING DOWN GUY
	NEW DOWN GUY
	EXISTING POWER POLE
	NEW POWER POLE

SYMBOL	DESCRIPTION
	FUSED CUTOUT
	SECTIONALIZING SWITCH (3 PHASE)
	NEW OVERHEAD WIRING (NUMBER OF HASH MARKS INDICATES NUMBER OF PHASES – 3 PHASE SHOWN)
	EXISTING OVERHEAD WIRING (3 PHASE SHOWN)
	EXISTING UNDERGROUND CONDUIT
	NEW UNDERGROUND CONDUIT
D	MANHOLE OR PULLBOX
	KEYNOTE
C	CALL SWITCH
S	WALL MOUNTED SPEAKER OR ALARM HORN
M	PASSIVE INFRARED MOTION DETECTOR, ARROW DENOTES CURTAIN DIRECTION
MCD	MAGNETIC CONTACT, DOOR MOUNTED
MCW	MAGNETIC CONTACT, WINDOW MOUNTED
EOL	END–OF–LINE RESISTOR
R/F	HEAT DETECTOR, GENERAL (SUBSCRIPT INDICATES RATE OF RISE OR FIXED TEMPERATURE)
P OR I	SMOKE DETECTOR GENERAL (SUBSCRIPT INDICATES PHOTOELECTRIC OR IONIZATION)
	FIRE ALARM MANUAL PULL STATION
	FIRE ALARM HORN/SPEAKER WITH BUILT–IN STROBE
	SPRINKLER SYSTEM FLOW SWITCH
	TAMPER SWITCH
R	RELAY IN FIRE ALARM SCHEMATICS
	MAGNETIC DOOR HOLDER
OR	DUCT SMOKE DETECTOR
	FIREMANS TELEPHONE STATION
	MUSHROOM HEAD EMERGENCY SWITCH
	PRESSURE DETECTOR IN FIRE ALARM SCHEMATICS
	LEVEL DETECTOR IN FIRE ALARM SCHEMATICS
	BELL FOR FIRE ALARM SYSTEM
	FIRE EXTINGUISHER, DRY CHEMICAL ABC RATED
	FIRE EXTINGUISHER, HALON TYPE
	GAS DETECTOR
	FLAME DETECTOR

- THIS LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS IS A STANDARD LIST. NOT ALL SYMBOLS ARE USED ON THIS PROJECT.
- SYMBOLS USED BUT NOT LISTED HERE SHALL BE DEFINED ELSEWHERE IN THE BID DOCUMENTS IF NOT, CONTACT THE ENGINEER FOR CLARIFICATION AT LEAST 10 DAYS PRIOR TO BID OPENING.
- SOME SYMBOLS ARE DRAWN THE SAME WITH DIFFERENT MEANINGS. USE OF THE PROPER MEANING SHALL BE JUSTIFIED BY THE CONTEXT IN WHICH IT IS APPLIED.
- BASIC ENGLISH LANGUAGE, MATHEMATIC AND SCIENTIFIC TERMINOLOGY AS ACCEPTED BY INDUSTRY IS IMPLIED FOR GENERAL USE TERMS AND ABBREVIATIONS SUCH AS MIGHT BE FOUND IN A DICTIONARY OR MATH HANDBOOK.

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
30144
LICENSED
PROFESSIONAL ENGINEER
11/13/24

		DATE	BY	REVISION
DESIGNER	LBA			
DRAWN	TEW			
CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

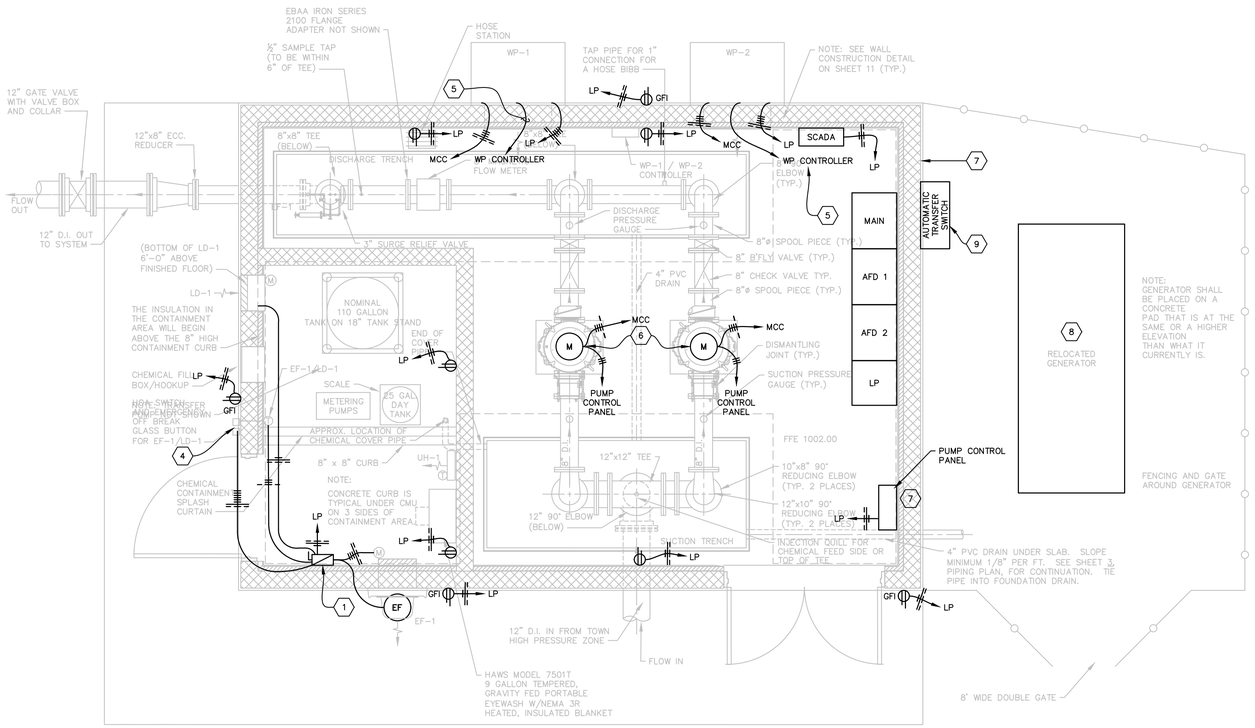
SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278–5412
Hopkinsville, KY (270) 886–5466
Somerset, KY (606) 485–4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ELECTRICAL SYMBOLS AND ABBREVIATIONS

DIVISION	–
CONTRACT NO.	691–21–01
DATE	SEPTEMBER 2021
SHEET NO.	E01 OF E07



NOTE:
MINIMUM DISMANTLING JOINT SUCTION PRESSURE IS 150 PSI

PLAN

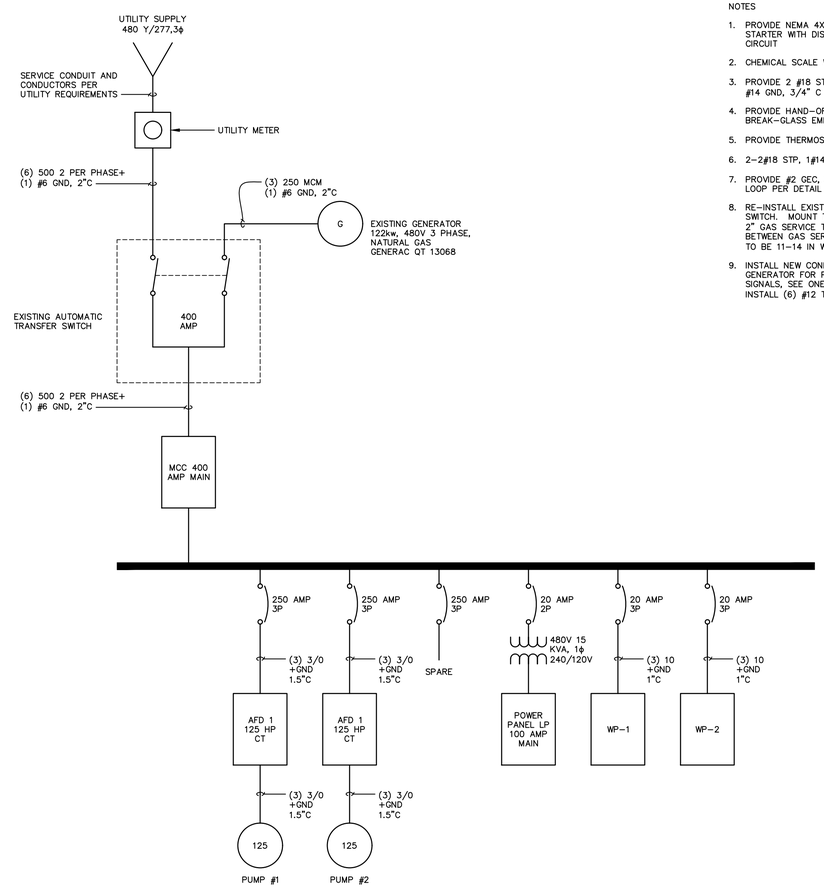
SCALE: 3/8"=1'-0"

NOTE:

SEE SHEET D1 FOR AIR RELEASE & GAUGE ASSEMBLIES DETAIL AND DIAPHRAGM SEAL & GAUGE SPECIFICATIONS.

CONTRACTOR TO PROVIDE A FLANGED SPOOL PIECE WITH THE SAME LAYING LENGTH AS THE MAG METER.

MINIMUM FLANGE ADAPTER PRESSURE RATING SHALL BE 250 PSI



ELECTRICAL MCC ONE-LINE DIAGRAM

NOT TO SCALE

NOTES

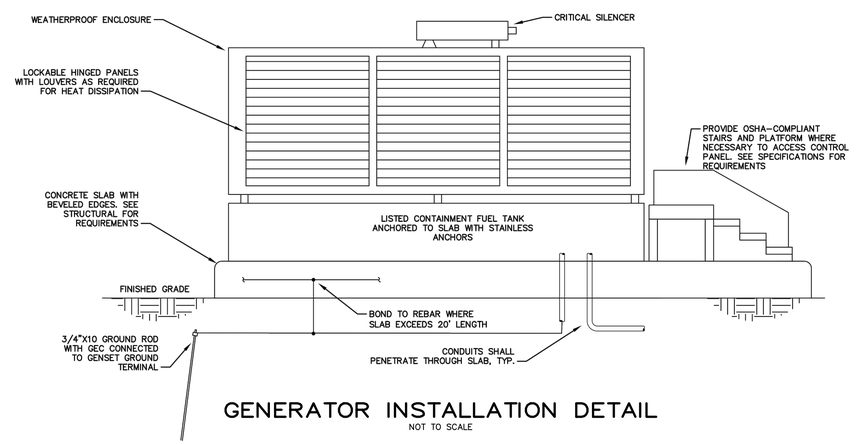
1. PROVIDE NEMA 4X SINGLE PHASE SIZE 1 COMBINATION STARTER WITH DISCONNECT. SEE EXHAUST FAN CONTROL CIRCUIT
2. CHEMICAL SCALE WITH PRIMARY CABLE PER DIVISION 11
3. PROVIDE 2 #18 STP, 3/4"C FOR HYPO SPEED AND 4 #14, 1 #14 GND, 3/4" C FOR HYPO CALL TO RUN SIGNALS.
4. PROVIDE HAND-OFF-AUTO SWITCH WITH PILOT LIGHT AND A BREAK-GLASS EMERGENCY SWITCH FOR FAN EF-1
5. PROVIDE THERMOSTAT CABLE 1 #14G, 3/4"C
6. 2-2#18 STP, 1#14G, 3/4"C
7. PROVIDE #2 GEC, 3/4"C AND PROVIDE #2 BUILDING GROUND LOOP PER DETAIL
8. RE-INSTALL EXISTING BACKUP GENERATOR AND TRANSFER SWITCH. MOUNT TRANSFER SWITCH TO WALL. RE-INSTALL 2" GAS SERVICE TO GENERATOR, INCLUDE FLEX CONNECTION BETWEEN GAS SERVICE AND GENERATOR SKID. GAS SERVICE TO BE 11-14 IN W.C. WITH FLOW RATE OF 1807432 BTU/HR.
9. INSTALL NEW CONDUIT BETWEEN TRANSFER SWITCH AND GENERATOR FOR POWER CONDUCTORS AND CONTROL SIGNALS, SEE ONE-LINE FOR POWER CONDUCTORS AND INSTALL (6) #12 THWN FOR CONTROL SIGNALS.

VOLTAGE	240 / 120 3 WIRE	PANEL	LP
MAIN AMP RATING	100 AMP	ENCLOSURE	NEMA 1
TOTAL SPACES	24	LOCATION	SHOPES CREEK BOOSTER PUMP

CIRCUIT	BREAKER	POLES	NO	PHASE A	PHASE B	NO	POLES	BREAKER	CIRCUIT
			1	100		2	1	15	FLOW METER
SPD	30A	2	3		800	4	1	20	LIGHTING
SCADA RTU	15	1	5	1000	800	6	1	20	RECEPTS
RECPTS	20	1	7	400	400	8	1	20	SPARE
RECPTS	20	1	9	400		10	1	20	SPARE
SPARE	20	1	11			12	1	20	SPARE
SPARE	20	1	13			14	1	20	SPARE
SPARE	20	1	15			16	1	20	SPARE
SPARE	20	1	17			18	1	20	SPARE
SPARE	20	1	19			20	1	20	SPARE
SPARE	20	1	21			22	1	20	SPARE
SPARE	20	1	23			24	1	20	SPARE
TOTAL VA PER PHASE				1900	2000				
TOTAL AMPS PER PHASE				15.83	16.67				

ELECTRICAL LP PANEL SCHEDULE

NOT TO SCALE



GENERATOR INSTALLATION DETAIL

NOT TO SCALE

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
30144
LICENSED PROFESSIONAL ENGINEER
11/13/24

DESIGNER	LBA	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

SCALE: AS NOTED

bell engineering
Lexington, KY (859) 278-5412
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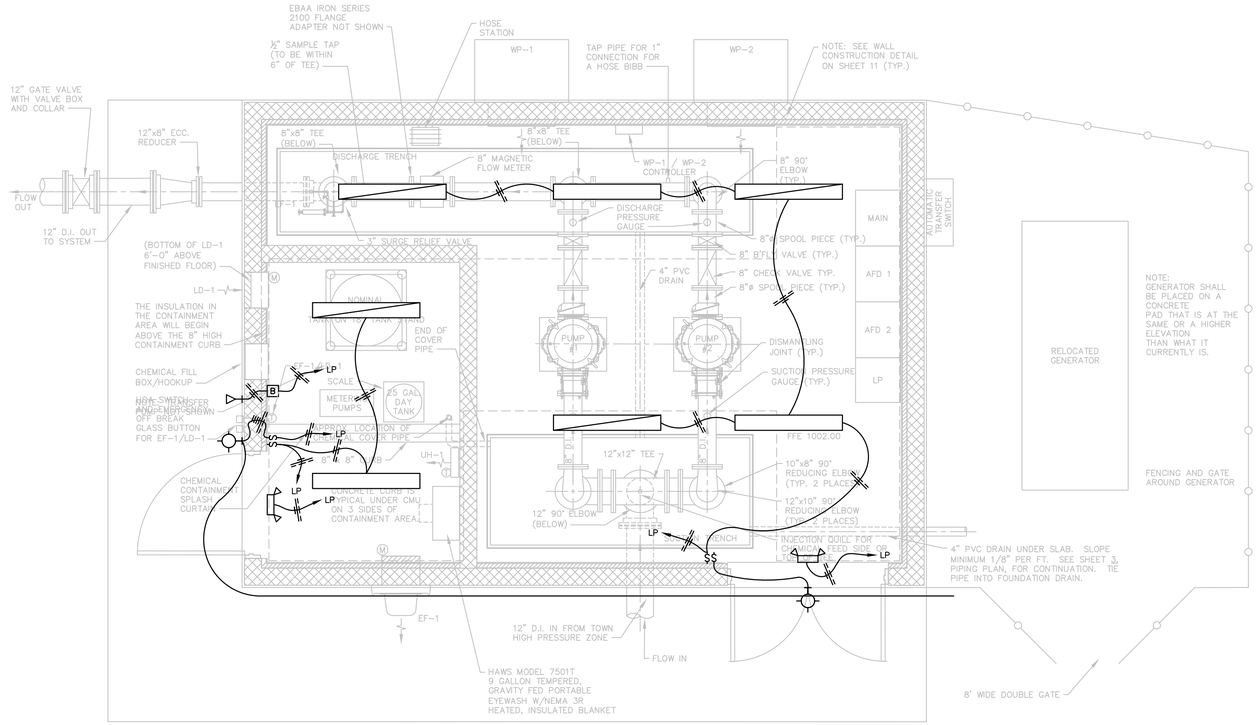
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ELECTRICAL POWER DISTRIBUTION PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	E02 OF E07



NOTE:
MINIMUM DISMANTLING JOINT SUCTION PRESSURE IS 150 PSI

PLAN
SCALE: 3/8"=1'-0"

NOTE:

SEE SHEET D1 FOR AIR RELEASE & GAUGE ASSEMBLIES DETAIL AND DIAPHRAGM SEAL & GAUGE SPECIFICATIONS.

CONTRACTOR TO PROVIDE A FLANGED SPOOL PIECE WITH THE SAME LAYING LENGTH AS THE MAG METER.

MINIMUM FLANGE ADAPTER PRESSURE RATING SHALL BE 250 PSI

LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURE	CATALOG SERIES	LAMPS	VOLTAG	MOUNTING	DESCRIPTION	SYMBOL
LF—1	HOLOPHANE	EMS LED	LED	120V	SURFACE	LINEAR ENCLOSED, 6000 LUMEN, 5000K, 90 CRI, ACRYLIC CLEAR LOW PROFILE LENS, 48" 5 YEAR WARRANTY	
LF—1E	HOLOPHANE	EMS LED	LED	120V	SURFACE	LINEAR ENCLOSED, 6000 LUMEN, 5000K, 90 CRI, ACRYLIC CLEAR LOW PROFILE LENS, 48" WITH 90 MINUTE EMERGENCY BATTERY BACKUP, 5 YEAR WARRANTY	
LF—2	HOLOPHANE	W4GLED	LED	120V	SURFACE	WALLPACK, 3400 LUMEN, 5000K WITH PHOTOCELL, POWDER-COATED ALUMINUM, VANDAL-RESISTANT POLYCARBONATE LENS, WET LOCATION, FULL CUT OFF, 5 YR WARRANTY	
LF—3	HOLOPHANE	LRNX	2—1.5W	12VDC	SURFACE	EMERGENCY REMOTE LAMP HEADS, NEMA 4X LED, 12 WATT, 12VDC	
LF—4	HOLOPHANE	C4224	N/A	120V	SURFACE	EMERGENCY BATTERY PACK, 24 WATT, 90 MINUTE, 12V BATTERY, LOW VOLTAGE DISCONNECT	B
LF-5	HOLOPHANE	MGLED	LED	120V	POLE	FLOOD LIGHT, 25K LUMEN, TYPE 5 AREA DISTRIBUTION, TILTABLE, BRONZE, INTEGRAL PHOTOCELL, 5 YEAR WARRANTY, 15' PAINTED STEEL POLE	

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
30144
LICENSED
PROFESSIONAL ENGINEER
11/13/24

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DESIGNER	LBA			
DRAWN	TEW			
CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

SCALE: AS NOTED

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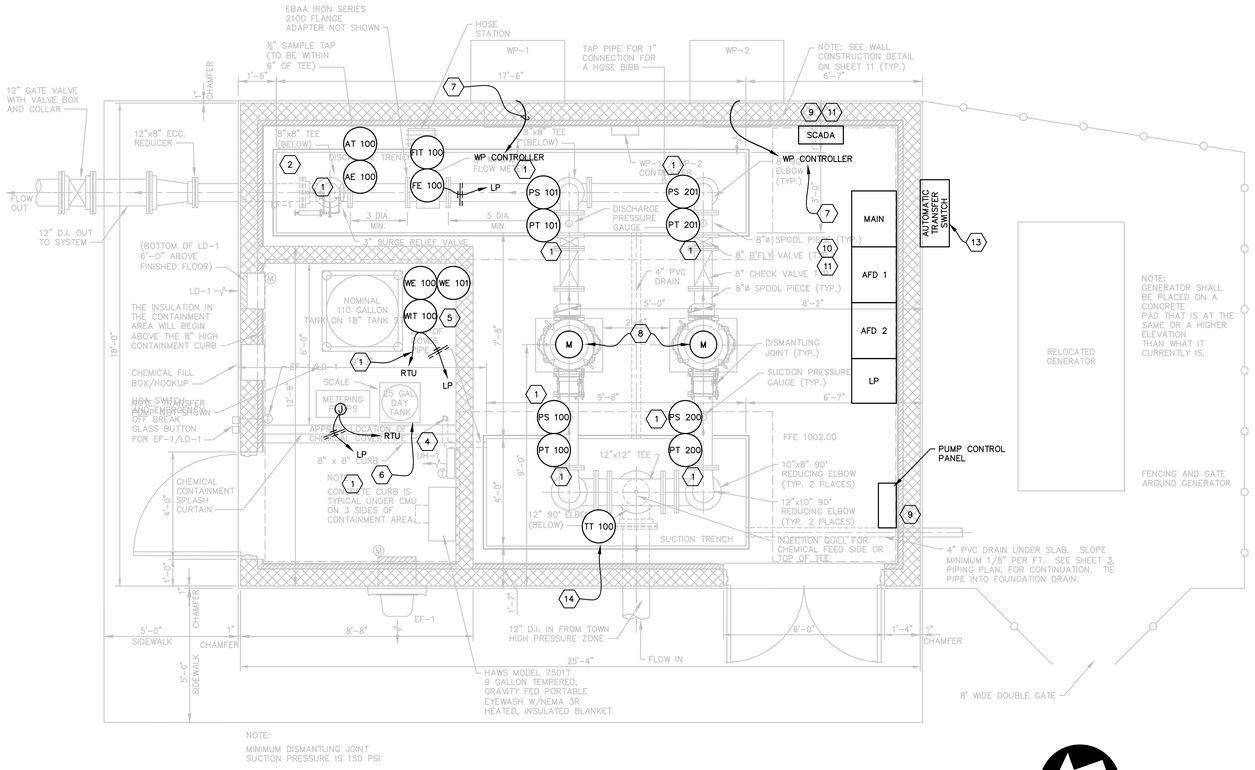
Somerset, KY (606) 485-4011

WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

LIGHTING PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	E03 OF E07



PLAN

SCALE: 3/8"=1'-0"

NOTE:

SEE SHEET D1 FOR AIR RELEASE & GAUGE ASSEMBLIES DETAIL AND DIAPHRAGM SEAL & GAUGE SPECIFICATIONS.

CONTRACTOR TO PROVIDE A FLANGED SPOOL PIECE WITH THE SAME LAYING LENGTH AS THE MAG METER.

MINIMUM FLANGE ADAPTER PRESSURE RATING SHALL BE 250 PSI

NOTES:

1. PROVIDE 2 #18 STP, 1 #14, 3/4" C. FROM METER TO RTU
2. CHEMICAL SCALE WITH PRIMARY CABLE PER DIVISION 11
3. PROVIDE 2 #18 STP, 3/4"C FOR HYPO SPEED AND 4 #14, 1 #14 GND, 3/4" C FOR HYPO CALL TO RUN SIGNALS.
4. PROVIDE 10 #18 STP, 1"C AND 12 #14, 1#14 GND, 3/4"C
5. PROVIDE LOCKABLE 20A / 1 P SAFETY SWITCH FOR VALVE
6. HYPO DISCHARGE SAFETY VALVE, PROVIDE INTERLOCK WITH PUMP CONTROL PANEL, IF NO PUMPS ARE RUNNING, THE VALVE IS CLOSED.
7. PROVIDE THERMOSTAT CABLE 1 #14G, 3/4"C
8. 2-2#18 STP, 1#14G, 3/4"C
9. PROVIDE (8) #18 STP, 1#14G, 1"C FROM PUMP CONTROL PANEL TO SCADA PANEL. SIGNALS FOR OVER TEMP, DRIVE FAULT, AND SCADA FAULT FOR 2 PUMPS.
10. PROVIDE (6) #18 STP, 1#14G, 1"C FROM PUMP CONTROL PANEL TO MCC. SIGNALS FOR PUMP CALL AND RUN STATUS, AFD1, AFD2.
11. PROVIDE (4) #18 STP, 1#14G, 1"C FROM SCADA PANEL TO MCC. SIGNALS FOR PUMP SPEED REFERENCE AND PUMP SPEED FEEDBACK. AFD 1, AFD 2, AND SPARE FOR AFD 3
12. 2-2#18 STP, 1#14G, 3/4"C BETWEEN HVAC CONTROL PANEL AND SCADA
13. INSTALL NEW CONDUIT BETWEEN TRANSFER SWITCH AND GENERATOR FOR POWER CONDUCTORS AND CONTROL SIGNALS, SEE ONE-LINE FOR POWER CONDUCTORS AND INSTALL (6) #12 THWN FOR CONTROL SIGNALS.
14. AMBIENT AIR TEMPERATURE AND HUMIDITY INDICATING TRANSMITTER, OMEGA HX93B OR EQUAL, WALL MOUNTED, (3) #18 STP IN 3/4" CONDUIT. CONNECT TO STATION SCADA ANALOG INPUT. ALARM ON HIGH TEMPERATURE 82 DEGREES.

SCADA IO TABLE

TAG	TYPE	UNIT	CONTROL	MONITOR	TREND	HISTORIZE	TOTALIZE	ALARM	AVERAGE	REPORT	SECURITY	NOTES
WT-100	AI	LBS	X	X						X		
AIT-100	AI	MB / L	X	X	X		X	X		X		ALARM LOW AND HIGH LEVELS, PROVIDE HOURLY LOG REPORT
HYPO METER PUMP #1 SPEED FEEDBACK	AI	%		X	X	X		X				
HYPO METER PUMP #2 SPEED FEEDBACK	AI	%		X	X	X		X				
FT-100	AI	FT		X	X	X		X				
PT-100	AI	PSI		X	X	X		X				SUCTION PRESSURE
PT-101	AI	PSI		X	X	X		X				DISCHARGE PRESSURE
PT-200	AI	PSI		X	X	X		X				SUCTION PRESSURE
PT-201	AI	PSI		X	X	X		X				DISCHARGE PRESSURE
RTU BATTERY ALARM	AI	V						X		X		
PUMP 1 SPEED FEEDBACK	AI	HZ		X	X	X						
PUMP 2 SPEED FEEDBACK	AI	HZ		X	X	X						
PUMP 3 SPEED FEEDBACK	AI	HZ		X	X	X						
AMBIENT AIR TEMPERATURE	AI	DEGREES		X	X			X		X		ALARM AT 82 DEGREES
AMBIENT AIR HUMIDITY	AI	PERCENT		X	X			X				
PUMP 1 SPEED COMMAND	AO	HZ	X									
PUMP 2 SPEED COMMAND	AO	HZ	X									
PUMP 3 SPEED COMMAND	AO	HZ	X									
HYPO METER PUMP #1 RUN STATUS	DI			X		X		X		X		ALARM FAIL TO START, REPORT # OF STARTS AND RUNTIME
HYPO METER PUMP#1 FAULT	DI			X		X		X		X		
HYPO METER PUMP #2 RUN STATUS	DI			X		X		X		X		ALARM FAIL TO START, REPORT # OF STARTS AND RUNTIME
HYPO METER PUMP#2 FAULT	DI			X		X		X		X		
HVAC SUMMARY ALARM	DI			X		X		X				
FT-100	DI	FT		X	X	X	X	X				
PS-100	DI			X				X				SUCTION PRESSURE ALARM
PS-101	DI			X				X				DISCHARGE PRESSURE ALARM
PS-200	DI			X				X				SUCTION PRESSURE ALARM
PS-201	DI			X				X				DISCHARGE PRESSURE ALARM
RTU POWER LOSS ALARM	DI							X		X		
RTU SURGE PROTECTION ALARM	DI							X		X		
PUMP 1 RUNNING STATUS	DI									X		
PUMP 1 OVERTEMP	DI							X				
PUMP 1 DRIVE FAULT	DI							X				
PUMP 2 RUNNING STATUS	DI									X		
PUMP 2 OVERTEMP	DI							X				
PUMP 2 DRIVE FAULT	DI							X				
PUMP 3 RUNNING STATUS	DI									X		
PUMP 3 OVERTEMP	DI							X				
PUMP 3 DRIVE FAULT	DI							X				
HYPO METER PUMP #1 PERMISSIVE	DO		X			X						
HYPO METER PUMP #2 PERMISSIVE	DO		X			X						
PUMP 1 START	DO		X									
PUMP 2 START	DO		X									
PUMP 3 START	DO		X									

INSTRUMENTATION SCHEDULE

TAG	DESCRIPTION	TYPE	RANGE	UNITS	OUTPUT	POWER	SENSOR MOUNTING	TRANS. MOUNTING
FT-100	FLOW TRANSMITTER	FLOW	0-500	GPM	4-20 mA	LOOP	ANSI FLANGE	ANSI FLANGE
PT-100	SUCTION PRESSURE TRANSMITTER	PRESSURE	0-250	PSIG	4-20 mA	LOOP	ANSI FLANGE	ANSI FLANGE
PT-101	DISHCARGE PRESSURE TRANSMITTER	PRESSURE	0-250	PSIG	4-20 mA	LOOP	ANSI FLANGE	ANSI FLANGE
PT-200	SUCTION PRESSURE TRANSMITTER	PRESSURE	0-250	PSIG	4-20 mA	LOOP	ANSI FLANGE	ANSI FLANGE
PT-201	DISHCARGE PRESSURE TRANSMITTER	PRESSURE	0-250	PSIG	4-20 mA	LOOP	ANSI FLANGE	ANSI FLANGE
WT-100	SCALE TRANSMITTER	SCALE	0-500	LBS	4-20 mA	LOOP	PAD	PAD
WE-100	DAY TANK SCALE	SCALE	0-500	LBS	4-20 mA	LOOP	PAD	PAD
WE-101	BULK TANK SCALE	SCALE	0-500	LBS	4-20 mA	LOOP	PAD	PAD
AT-100	RESIDUAL CHLORINE	CHLORINE ANALYZER	0-5	MG/L	4-20 mA	120VAC	WALL MOUNT	WALL MOUNT
TIT-100	AMBIENT AIR TEMPERATURE / HUMIDITY TRANSMITTER	TEMPERATURE	0-100 F	DEGREES	4-20 mA	LOOP		WALL
PS-100	SUCTION PRESSURE ALARM	PRESSURE SWITCH			DI	LOOP	ANSI FLANGE	ANSI FLANGE
PT-100	DISCHARGE PRESSURE ALARM	PRESSURE SWITCH			DI	LOOP	ANSI FLANGE	ANSI FLANGE
PS-201	SUCTION PRESSURE ALARM	PRESSURE SWITCH			DI	LOOP	ANSI FLANGE	ANSI FLANGE
PS-200	DISCHARGE PRESSURE ALARM	PRESSURE SWITCH			DI	LOOP	ANSI FLANGE	ANSI FLANGE

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
30144
LICENSED PROFESSIONAL ENGINEER
11/13/24

		DATE	BY	REVISION
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DRAWN	TEW			
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GRAPHIC SCALE

SCALE: AS NOTED

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WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
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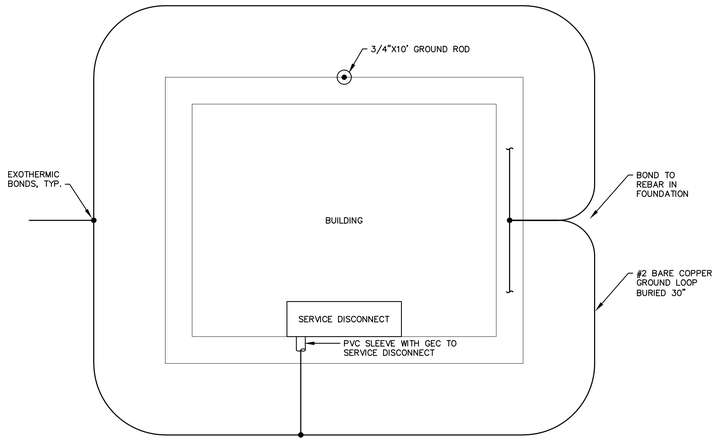
CANNONSBURG, KENTUCKY

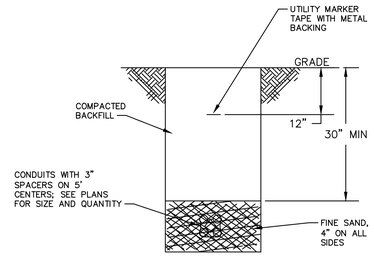
INSTRUMENTATION PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	E04 OF E07



BUILDING GROUNDING DETAIL

NOT TO SCALE

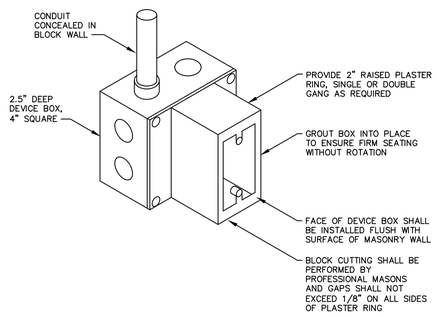


TYPICAL TRENCH DETAIL 1

NOT TO SCALE

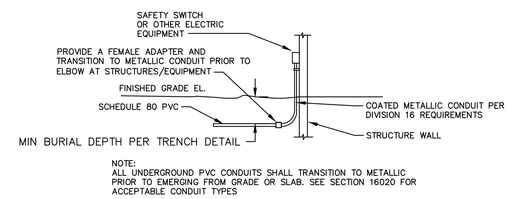
TRENCHING NOTES:

- PROVIDE PULL CORD IN ALL CONDUITS.
- UTILITY MARKER TAPE SHALL RUN THE ENTIRE LENGTH OF DUCT BANK.
- MAINTAIN MINIMUM 36" SPACING BETWEEN OTHER SITE PIPING, INCLUDING WATER, AND GAS.



TYPICAL OUTLET JUNCTION BOX DETAIL

NOT TO SCALE



NOTE:
ALL UNDERGROUND PVC CONDUITS SHALL TRANSITION TO METALLIC PRIOR TO EMERGING FROM GRADE OR SLAB. SEE SECTION 16020 FOR ACCEPTABLE CONDUIT TYPES

TYPICAL UNDERGROUND PVC CONDUIT TRANSITION TO METALLIC CONDUIT DETAIL 3

NOT TO SCALE

STATE OF KENTUCKY
LARRY BENJAMIN ALLEN
30144
LICENSED PROFESSIONAL ENGINEER
11/13/24

DESIGNER	LBA	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

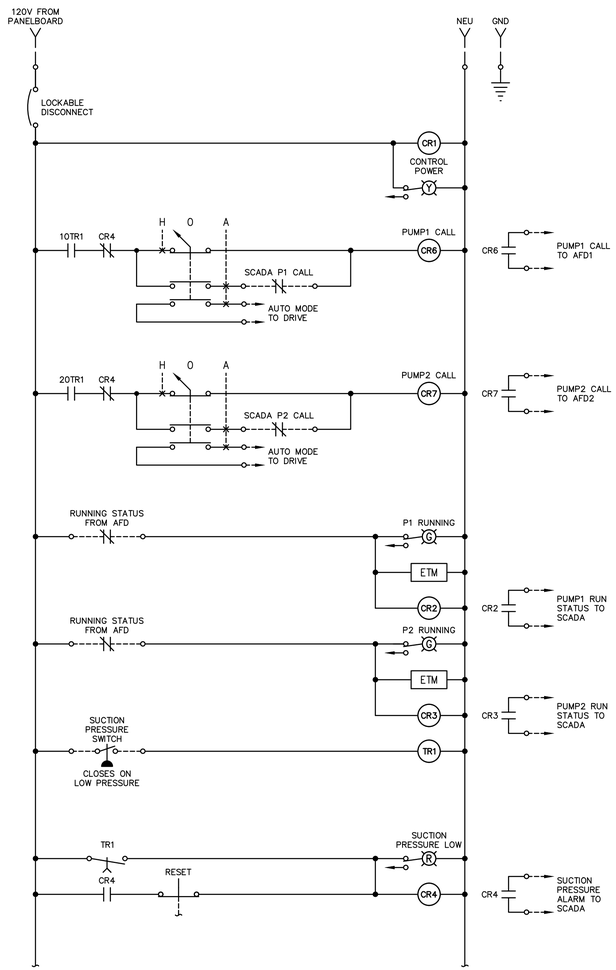
SCALE: AS NOTED

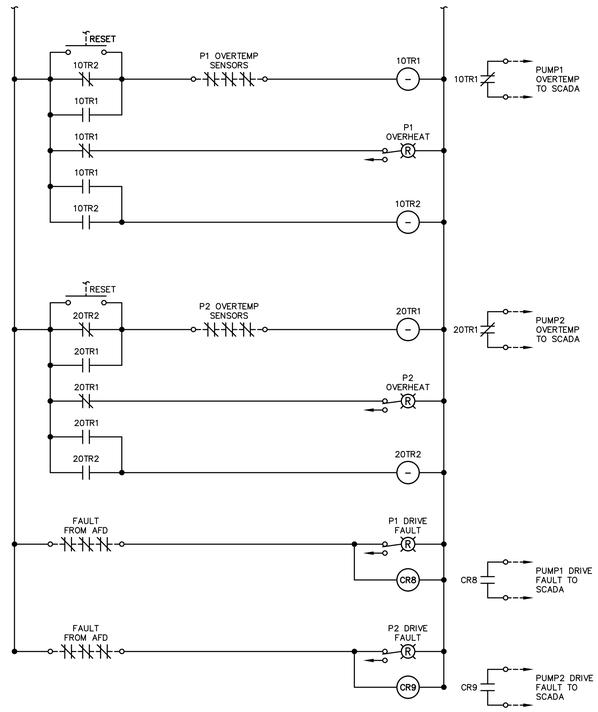
bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466
Somerset, KY (606) 485-4011

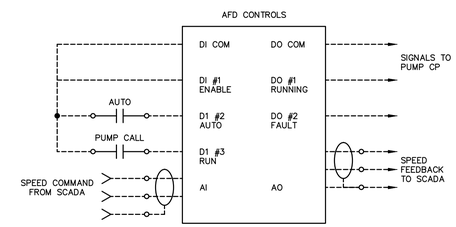
WATER SYSTEM IMPROVEMENTS
SHOPES CREEK ROAD AREA
CANNONSBURG WATER DISTRICT
CANNONSBURG, KENTUCKY

ELECTRICAL DETAILS

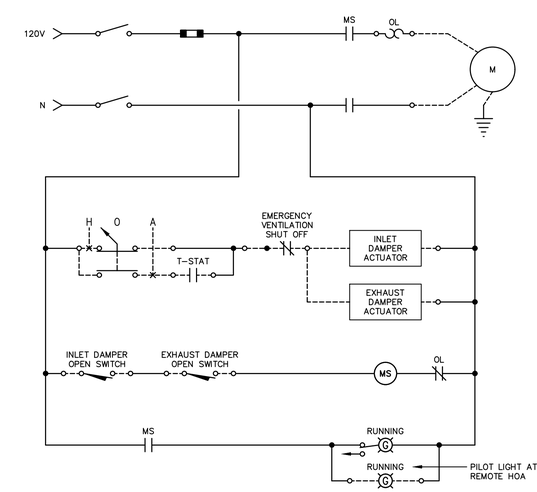
DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	E05 OF E07







- IN HAND MODE, SPEED SHALL BE SET FROM DRIVE INTERFACE MODULE. IN AUTO MODE, SPEED SHALL BE SET IN PRESET FREQUENCY PARAMETER.
- DRIVES SHALL BE WALL-MOUNTED SEPARATE FROM PANEL AS INDICATED ON PLANS.
- PANEL TO INCLUDE SPARE SPACE AND TERMINALS TO EXPAND TO 3 PUMP CONTROL PANEL.
- PUMPS RUN ALTERNATING BASED ON TIME.



EXHAUST FAN/LOUVER CONTROL CIRCUIT WITH REMOTE HOA SWITCH

NOT TO SCALE

STATE OF KENTUCKY
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PROFESSIONAL ENGINEER
11/13/24

DESIGNER	LBA	DATE	BY	REVISION
DRAWN	TEW			
CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

SCALE: AS NOTED

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WATER SYSTEM IMPROVEMENTS
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ELECTRICAL WIRING DIAGRAMS

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
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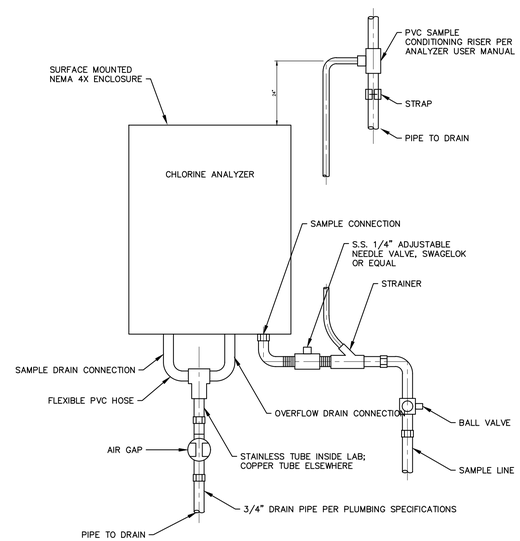
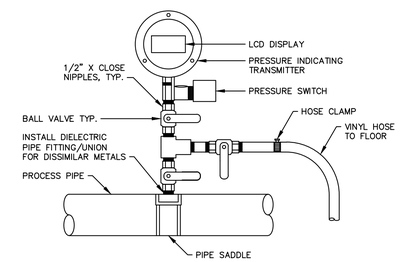


CHLORINE ANALYZER DETAIL

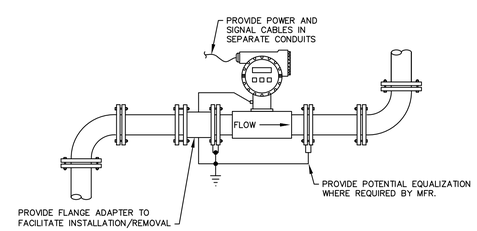
NOT TO SCALE

NOTE: ALL FITTINGS SHALL BE STAINLESS STEEL WHERE AVAILABLE.



PRESSURE SWITCH PIPING DETAIL

NOT TO SCALE



MAGMETER INSTALLATION DETAIL

NOT TO SCALE

STATE OF KENTUCKY
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11/13/24

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CHECKED	LBA			
APPROVED	LBA			

GRAPHIC SCALE

SCALE: AS NOTED

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WATER SYSTEM IMPROVEMENTS
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INSTRUMENTATION DETAILS

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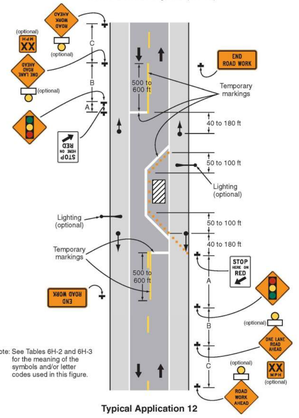
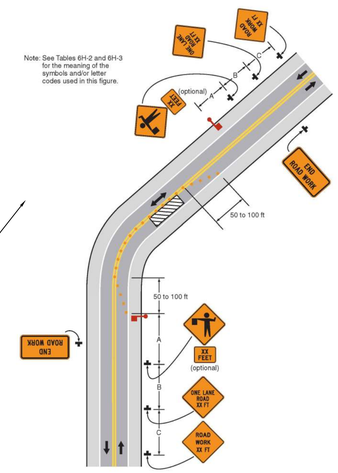
SHEET NO.	E07 OF E07

Figure 6H-12. Lane Closure on a Two-Lane Road Using Traffic Control Signals (TA-12)



Typical Application 12

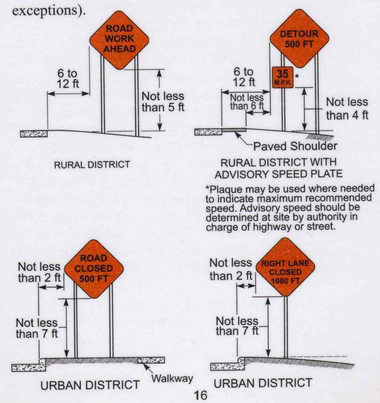
Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)



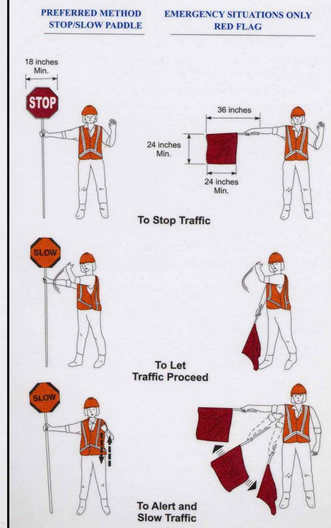
Typical Application 10

Sign Placement

Signs should normally be located on the right side of the roadway. Where special emphasis is needed, signs may be placed on both the left and right sides of the roadway. Signs mounted on barricades and barricade/sign combinations shall be crashworthy. Neither portable nor permanent sign supports should be located on sidewalks, bicycle lanes, or areas designated for pedestrian or bicycle traffic. Signs mounted on portable supports should not be used for a duration of more than 3 days (there are exceptions).

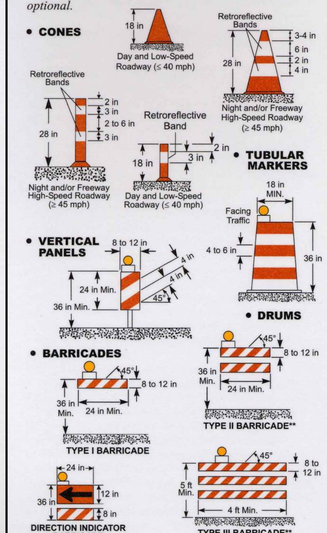


The use of the flag and sign paddle are displayed in the following illustration.



Channelizing Devices

NOTE: Warning lights on Channelizing Devices are optional.



Advance Warning Area

The distance from the first sign to the start of the transition area should be long enough to give motorists adequate time to respond to the conditions. Guidelines are presented in the summary of layout dimensions as referenced in the following typical application diagrams (A, B, C).

Summary of Layout Dimensions
Sign Spacing

Road Type	Distance Between Signs (feet) A	B	C
Urban (<40 mph)	100	100	100
Urban (Eq. or >45 mph)	350	350	250
Rural	500	500	500
Expressway/Freeway	1,000	1,500	2,640

Channelizing Device Spacing

	Taper	Buffer/Work Space Downstream	
Two-lane	20'	2 x Speed Limit	20'
Multi-lane	Speed Limit	2 x Speed Limit	20'

Summary of Layout Dimensions
Tapers and Flagger Station

Speed Limit	Two-Lane Taper	Multi Lane Merging Taper (12' Lane)	Multi Lane Shifting Taper (12' Lane)	Multi Lane Shoulder Taper (10' Shoulder)	Flagger Station
20	100	80	40	25	35
25	100	125	70	35	55
30	100	180	90	50	85
35	100	250	130	70	120
40	100	320	160	90	170
45	100	540	280	150	220
50	100	600	300	170	280
55	100	660	330	190	335
60	100	720	360	200	415
65	100	780	390	220	485

Note: (Downstream taper = 100 ft)

112.03.01 GENERAL TRAFFIC CONTROL

MAINTAIN THE PORTION OF THE PROJECT USED BY PUBLIC TRAFFIC, AND ADEQUATELY ACCOMMODATE THROUGH AND LOCAL TRAFFIC. THE DEPARTMENT'S INTENT IS FOR THE TRAFFIC CONTROL PLAN AND DEVICES TO PROVIDE THE PUBLIC A SAFE AND MANAGEABLE ROADWAY. IN THE EVENT THE CONTRACTOR FEELS ADDITIONAL MEASURES ARE NECESSARY TO PROTECT THE WORK, THESE CHANGES SHALL BE DISCUSSED WITH THE ENGINEER AND IF AGREED UPON WILL BE PAID AT CONTRACT BID PRICES OR ADDED BY SUPPLEMENTAL AGREEMENT. THE DEPARTMENT WILL BE RESPONSIBLE FOR NORMAL ROUTINE MAINTENANCE ACCORDING TO SUBSECTION 105 .11.
FURNISH, ERECT, AND MAINTAIN ALL TRAFFIC CONTROL DEVICES, INCLUDING SIGNS, SIGNALS , CHANNELIZATION DEVICES, TEMPORARY PAVEMENT MARKINGS, PILOT CARS AND OTHER ITEMS NECESSARY TO MAINTAIN TRAFFIC ACCORDING TO THE STANDARD DRAWINGS , MUTCD, PLANS, TCP, AND THE ATSSA "QUALITY STANDARD FOR WORK ZONE TRAFFIC CONTROL DEVICES" MANUAL THROUGHOUT THE DURATION OF THE PROJECT.

WORK ZONE TRAFFIC CONTROL (DIST. 9)

PRIOR TO BEGINNING OF WORK ON KENTUCKY TRANSPORTATION RIGHTS-OF-WAY THE CONTRACTOR SHALL HAVE COMPLETED THE KENTUCKY TRANSPORTATION CABINET'S WORK ZONE TRAFFIC CONTROL EMPLOYEE QUALIFICATION PROGRAM. INDIVIDUALS PERFORMING FLAGGING OPERATIONS ON ANY KENTUCKY ROADWAY MUST BE QUALIFIED AND CERTIFIED BY THE KENTUCKY TRANSPORTATION CABINET. INDIVIDUALS WHO PLACE, MONITOR, AND MAINTAIN TRAFFIC CONTROL DEVICES ON PUBLIC ROADWAYS IN KENTUCKY SHALL HAVE SUCCESSFULLY COMPLETED THE WORK ZONE TRAFFIC CONTROL TECHNICIAN PROGRAM. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PREPARING AND IMPLEMENTING THE TRAFFIC CONTROL PLAN, THE INDIVIDUALS RESPONSIBLE FOR THIS WORK SHALL HAVE SUCCESSFULLY COMPLETED THE WORK ZONE TRAFFIC CONTROL SUPERVISOR PROGRAM. FOR MORE INFORMATION ON THE WORK ZONE TRAFFIC CONTROL EMPLOYEE QUALIFICATION PROGRAM AS PRESENTED BY THE TECHNOLOGY TRANSFER PROGRAM, KENTUCKY TRANSPORTATION CENTER, UNIVERSITY OF KENTUCKY CALL THE CENTER'S TOLL FREE NUMBER 1-800-432-0719 OR CONTACT THE DEPARTMENT OF HIGHWAYS, DISTRICT 9, 822 ELIZAVILLE, FLEMINGSBURG KENTUCKY 41041, PHONE 606-854-2551.

STATE OF KENTUCKY DAVID E. GERNERT 20703 LICENSED PROFESSIONAL ENGINEER

11-12-24

		DATE	BY	REVISION
DESIGNER	DEG			
DRAWN	TEW			
CHECKED	DEG			
APPROVED	DEG			

GRAPHIC SCALE

SCALE: AS NOTED

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WATER SYSTEM IMPROVEMENTS
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TRAFFIC CONTROL PLAN

DIVISION	–
CONTRACT NO.	691-21-01
DATE	SEPTEMBER 2021
SHEET NO.	TC-1 OF TC-1