LEGEND		
DESCRIPTION	EXISTING	PROPOSED
FENCE		
MAJOR CONTOUR LINE	250	250
MINOR CONTOUR LINE	202	202
DITCH OR SWALE		
EDGE OF STREAM OR RIVER		
LAKE OR POND		
PROPERTY LINE / RIGHT-OF-WAY		
SILT FENCE		SF
EDGE OF PAVEMENT		
EDGE OF GRAVEL/DIRT ROAD		
EDGE OF WOODS		
BUILDING		
STORM SEWER	ST	ST
SANITARY SEWER	S	S
FORCE MAIN	FM	FM
WATER LINE	W	W
GAS LINE	G	GAS
FIBER OPTIC LINE	FO	
UNDERGROUND ELECTRIC	UE	UE
UNDERGROUND TELEPHONE	T	TELE
OVERHEAD TELEPHONE	T	TELE
OVERHEAD ELECTRIC	OE	OE
BARRICADE		
GUIDE RAIL		
CATCH BASIN		
STORM MANHOLE		
FLOW DIRECTION		
HYDRANT		
WATER VALVE		
WATER METER		
SANITARY SEWER MANHOLE		S OR
PULL BOX		
TELEPHONE PEDESTAL		
ELECTRIC BOX		PB
ELECTRIC MANHOLE		
LIGHT POLE, LAMP POST		
POWER POLE / UTILITY POLE		
MAILBOX		
SIGN - SINGLE FACED		OR
RIGHT-OF-WAY MONUMENT		
IRON ROD, PIN, OR PIPE		
BORING LOCATION	B-1	
CENTER LINE		
WETLAND/MARSH		
TREES, SHRUBS, BUSHES		XX-3 XX-5
AIR RELEASE VALVE		SIZE IN INCHES — 2

LEGEND (CONTINUED)		
DESCRIPTION	EXISTING	PROPOSED
BLOW OFF VALVE		SIZE IN INCHES — B2
SPECIFIC NOTES		2
PROJECT NORTH ARROW		
DETAIL CALLOUT		X — DETAIL IDENTIFICATION NO. X-X — SHEET NO. WHERE DETAIL IS SHOWN
DETAIL IDENTIFICATION NO.		X DETAIL TITLE
NOTE: SOME FEATURES IN THE LEGEND MAY NOT HAVE BEEN USED		

TABLE OF ABBREVIATIONS			
AC	ACRE	MON	MONUMENT
APPROX	APPROXIMATE	N	NORTH
ARV	AIR RELEASE VALVE	NIC	NOT IN CONTRACT
ASPH	ASPHALT	O/S	OFFSET
BLDG	BUILDING	OT	OVERHEAD TRANSMISSION LINE
BM	BENCHMARK	PL	PROPERTY LINE
BO	BLOW OFF	PE	PERMANENT EASEMENT
BOT	BOTTOM	PERF	PERFORATED
BV	BUTTERFLY VALVE	PERP	PERPENDICULAR
CB	CATCH BASIN	PP	POWER POLE, POWER PANEL
CF	CUBIC FOOT OR CUBIC FEET	PPM	PARTS PER MILLION
CI	CURB INLET	PROP	PROPOSED
CIP	CAST IRON PIPE	PSF	POUNDS PER SQUARE FOOT
CL	CLASS OR CENTERLINE	PSI	POUNDS PER SQUARE INCH
CMP	CORRUGATED METAL PIPE	PSF	POLYVINYL CHLORIDE
CO	CLEANOUT	PWR	POWER
CONC	CONCRETE	R	RADIUS
CTR	CENTER	RCP	REINFORCED CONCRETE PIPE
CTV	CABLE TELEVISION	RD	ROAD
CULV	CULVERT	REQD	REQUIRED
CY	CUBIC YARD	RJ	RESTRAINED JOINT
DI	DROP INLET	ROW	RIGHT-OF-WAY
DIA	DIAMETER	RR	RAILROAD
DIP	DUCTILE IRON PIPE	RT	RIGHT
DW	DRIVEWAY	RW	RETAINING WALL
DWG	DRAWING	S	SOUTH
E	EAST	SCH	SCHEDULE
EA	EACH	SCP	STEEL CASING PIPE
ELEC	ELECTRIC	SF	SQUARE FOOT OR SQUARE FEET
ELEV	ELEVATION	SH	STATE HIGHWAY
EOP	EDGE OF PAVEMENT	SHT	SHEET
EX	EXISTING	SMH	SANITARY MANHOLE
FH	FIRE HYDRANT	SPECS	SPECIFICATIONS
FO	FIBER OPTIC	SQ	SQUARE
FT	FOOT OR FEET	STA	STATION
GAL	GALLON	STMH	STORM MANHOLE
GPM	GALLONS PER MINUTE	SY	SQUARE YARD
GRD	GROUND OR GRADE	TC	TOP OF CURB
GV	GATE VALVE	TE	TEMPORARY EASEMENT
GR	GRAVEL	TEL	TELEPHONE
HDPE	HIGH DENSITY POLYETHELENE PIPE	TEL PED	TELEPHONE PEDESTAL
HORIZ	HORIZONTAL	TEMP	TEMPORARY
HP	HIGH POINT OR HORSE POWER	TF	TOP OF FRAME
HT	HEIGHT	TRANS	TRANSFORMER
HW	HEADWALL	TS&V	TAPPING SLEEVE AND VALVE
IE	INVERT ELEVATION	TYP	TYPICAL
IN	INCH(ES)	UD, U/D	UNDERDRAIN
IP(F)	IRON PIPE (FOUND)	U(ND)G	UNDERGROUND
JB	JUNCTION BOX	VB	VALVE BOX
LAT	LATITUDE	VCP	VITRIFIED CLAY PIPE
LB	POUND	VERT	VERTICAL
LF	LINEAR FOOT OR LINEAR FEET	VOL	VOLUME
LONG	LONGITUDE	W	WEST
LP	LAMP POST, LIGHT POLE, LIGHT PANEL	W/	WITH
LT	LEFT	WM	WATER METER
MFR	MANUFACTURER	W/O	WITHOUT
MH	MANHOLE	WV	WATER VALVE
MIN	MINIMUM	WW	WING WALL
MISC	MISCELLANEOUS	WWF	WELDED WIRE FABIC OR WOVEN WIRE FABRIC
MJ	MECHANICAL JOINT		
NOTE: SOME ABBREVIATIONS MAY NOT HAVE BEEN USED			

GENERAL NOTES

(NOTES APPLY TO THE ENTIRE DRAWING SET)

1. CONTRACTOR SHALL INSTALL WATER LINES AS INDICATED ON THE PLANS AND SHALL NOT DISTURB ANY AREA WITHIN 5 FEET FROM EDGE OF PAVEMENT (UNLESS NOTED OTHERWISE). LIMITS OF CONSTRUCTION SHALL BE CONFINED TO EXISTING VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) RIGHTS-OF-WAY AND/OR EASEMENTS/LIMITS OF CONSTRUCTION INDICATED.
2. WATER LINE SHALL BE INSTALLED: WITH A MINIMUM OF 3 FEET OF COVER; OR 3 FEET BELOW THE ADJACENT ROADWAY ELEVATION; OR 2 FEET BELOW THE FLOW LINE OF THE SIDE DITCH; WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
3. LOCATION OF VALVES, BLOW-OFFS AND AIR RELEASE VALVES SHOWN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE AS DIRECTED BY OWNER/ENGINEER IN THE FIELD.
4. ALL MAIN LINE VALVES ARE RESILIENT SEAT WEDGE GATE VALVES AND SHALL BE SAME SIZE AS LINE SIZE.
5. AIR RELEASE VALVES ARE SHOWN AT HIGH SPOTS ALONG THE WATER LINE ROUTE. CONTRACTOR SHALL INSTALL WATER LINE SO THAT THE LOCATION OF THE AIR RELEASE VALVES WILL ALSO BE THE HIGH SPOT IN THE WATER LINE.
6. STATION NUMBERS INDICATED ARE FOR REFERENCE ONLY. THESE STATIONS ARE NOT NECESSARILY REPRESENTATIVE OF ACTUAL FOOTAGE OF WATER LINE.
7. ALL BORES SHALL MAINTAIN A MINIMUM OF 18-INCHES CLEARANCE BETWEEN THE STEEL CASING PIPE AND EXISTING UTILITIES. WATER, TELEPHONE, GAS AND CABLE TV LINES ARE ASSUMED TO HAVE A MINIMUM OF 3 FEET OF COVER. CONTRACTOR SHALL POSITION AND MAINTAIN CONCRETE 'JERSEY' BARRIERS AROUND BORE PITS IN ADDITION TO ALL OTHER NECESSARY AND REQUIRED SAFETY AND PROTECTION SIGNS AND DEVICES.
8. AT ALL FITTINGS AND/OR BENDS, CONTRACTOR SHALL USE PIPE MANUFACTURERS RECOMMENDED RESTRAINED JOINT SYSTEM. GRIPPER TYPE GASKETS WILL ONLY BE ALLOWED INSIDE CASING PIPES. (SEE S[redacted]ATION [redacted]N _____ AND _____ FOR ADDITIONAL INFORMATION). RESTRAINED JOINT SYSTEM SHALL BE SUBJECT TO ENGINEER'S REVIEW AND APPROVAL. ALL RJ PIPE SHALL BE DIP UNO.
9. PIPE JOINT DEFLECTIONS SHALL BE NO GREATER THAN 80% OF THE MANUFACTURERS RECOMMENDED MAXIMUM DEFLECTION UNLESS NOTED OTHERWISE ON THE PLANS. CONTRACTOR SHALL NOTIFY OWNER/ENGINEER WHEN JOINTS OR FITTINGS NOT SHOWN ARE REQUIRED.
10. ALL TIE-INS TO EXISTING WATER LINES SHALL BE SCHEDULED AND COORDINATED WITH BRWA AT LEAST 48 HOURS PRIOR TO MAKING CONNECTION. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING LINE AS WELL AS MATERIALS NEEDED FOR TIE-IN.
11. CONTRACTOR SHALL INSTALL TRACER WIRE AND WARNING TAPE ON ALL BURIED WATER PIPING. SEE SECTION [redacted] FOR ADDITIONAL INFORMATION.
12. ACCESS TO AND FOR PIPELINE CONSTRUCTION SHALL BE ALONG EXISTING ROADS OR ALONG PERMANENT AND/OR CONSTRUCTION EASEMENTS ONLY. IF ADDITIONAL AREAS ARE NEEDED FOR THE STORAGE OF EQUIPMENT OR SUPPLIES, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR OBTAINING SUCH AREAS AND SHALL NOTIFY THE OWNER OF ALL SUCH ARRANGEMENTS. ANY AGREEMENT BETWEEN CONTRACTOR AND PROPERTY OWNERS SHALL BE MADE IN WRITING AND COPIED TO BRWA.
13. CONTRACTOR SHALL PLACE MINIMUM OF ¼-INCH SCREENINGS AND/OR SAND ON ALL PAVED ROADS PRIOR TO PLACEMENT OF TRACK EQUIPMENT, EXCAVATED MATERIAL AND/OR BACKFILL MATERIAL ON VDOT PAVEMENT.
14. CONTRACTOR SHALL REPAIR/REPLACE ALL STATE MAINTAINED PAVEMENT DAMAGED BY CONSTRUCTION ACTIVITIES TO SATISFACTION OF VDOT. NO SEPARATE PAYMENT SHALL BE MADE FOR PAVEMENT REPAIR EXCEPT AS NOTED ON THE PLANS OR IN THE SPECIFICATIONS.
15. THE CONTRACTOR SHALL RECONSTRUCT ALL ROAD SHOULDERS, DRAINAGE DITCHES, SWALES AND DRAINAGE CULVERTS DISTURBED BY CONSTRUCTION ACTIVITIES TO THEIR ORIGINAL LOCATION AND GRADE.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ALL EXISTING PAVEMENTS, DRIVEWAYS, GRAVEL ROADWAYS, PIPE CULVERTS, CULVERT HEADWALLS, FENCES, SIGNS, MAILBOXES AND OTHER MISCELLANEOUS ITEMS WHERE REQUIRED TO COMPLETE CONSTRUCTION.
17. CONTRACTOR SHALL ATTEMPT TO FREE BORE ALL PAVED DRIVEWAYS (CONCRETE AND ASPHALT). IN THE EVENT THE FREE BORE CANNOT BE INSTALLED, CONTRACTOR MAY OPEN CUT WITH OWNER APPROVAL. PAYMENT WILL BE BASED ON METHOD OF INSTALLATION. NO PAYMENT WILL BE MADE FOR UNSUCCESSFUL FREE BORES.
18. CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE THAT ACCESS TO EXISTING RESIDENCES AND PROPERTY IS NOT IMPAIRED. CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS FOR ALL PROPERTY OWNERS WITHIN AND ADJACENT TO CONSTRUCTION AREAS AT ALL TIMES.
19. THERE IS NO PAY ITEM FOR DEWATERING AND NO SEPARATE PAYMENT WILL BE MADE FOR DEWATERING. ANY DEWATERING OF THE TRENCH REQUIRED IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE INCIDENTAL TO THE UNIT PRICE FOR THE PIPE INSTALLATION.
20. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH VDOT SPECIFICATIONS AND REQUIREMENTS. AT A MINIMUM, LANE OPPOSITE CONSTRUCTION SHALL REMAIN OPEN AT ALL TIMES. EXCAVATED MATERIALS WILL NOT BE ALLOWED TO CROSS CENTERLINE OF ROAD.
21. REMOVAL OF EXCAVATED MATERIALS AND DAILY CLEANUP OPERATIONS SHALL BE PERFORMED IN COMPLIANCE WITH THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER/ENGINEER, AND/OR VDOT.
22. ALL ROCKS, BRUSH, TIMBER, AND OTHER DEBRIS THAT IS CLEARED FROM THE RIGHTS-OF-WAY SHALL BE REMOVED FROM THE PREMISES AND SHALL NOT BE PLACED ON ADJOINING LANDS, EXCEPT WHERE ARRANGEMENTS FOR SUCH PLACEMENT OR DISPOSAL ARE MADE WITH THE APPROPRIATE PROPERTY OWNER(S).
23. EXCESS/UNSUITABLE SPOIL TO BE REMOVED FROM SITE. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL SUBMIT THE OFF-SITE SPOIL LOCATIONS TO BE USED AND PROVIDE DOCUMENTATION OF EROSION CONTROL MEASURES TO BE USED DURING DISPOSAL OPERATIONS. CONTRACTORS OFF-SITE SEDIMENT CONTROL PLAN MUST BE APPROVED BY _____, AND COPIED TO BRWA PRIOR TO SPOIL DISPOSAL.
24. ALL TREE PROTECTION AND EROSION CONTROL AND SEDIMENTATION CONTROLS SHALL BE IMPLEMENTED BEFORE CONSTRUCTION COMMENCES AND SHALL NOT BE REMOVED UNTIL VEGETATION HAS BEEN SATISFACTORILY RE-ESTABLISHED.
25. LOCATIONS OF EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED BASED ON THE INFORMATION AVAILABLE. THESE LOCATIONS ARE NOT INTENDED TO BE EXACT AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES AND FIELD VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. LOCATE EXISTING UTILITIES WELL AHEAD OF PIPE LAYING OPERATIONS TO ALLOW FOR ADJUSTMENT TO WATER LINE ALIGNMENT AND ELEVATION AS REQUIRED. NO SEPARATE PAYMENT WILL BE MADE FOR FIELD VERIFICATION OR ADJUSTMENTS TO DEPTH REQUIRED FOR PROPER INSTALLATION. ANY ADJUSTMENTS TO LAYOUT SHOWN SHALL BE SUBJECT TO OWNER/ENGINEER APPROVAL. CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES TO EXISTING UTILITY LINES AND/OR SERVICES.
26. IN THE EVENT OF DAMAGE TO EXISTING UTILITIES, CONTRACTOR SHALL STOP WORK IMMEDIATELY, TAKE NECESSARY PRECAUTIONS TO PREVENT INJURY OR FURTHER DAMAGE, AND NOTIFY THE PROPER AUTHORITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING/REPAIRING/REPLACING ALL EXISTING STRUCTURES, CONDUITS OR OTHER UTILITIES DAMAGED BY CONTRACTOR'S OPERATIONS AT NO COST TO OWNER.
27. REMOVAL AND REPLACEMENT OR REPAIR OF EXISTING UTILITY SERVICES SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY. COST SHALL BE INCLUDED IN UNIT PRICE FOR PIPE.
28. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH POWER AND TELEPHONE COMPANIES FOR RELOCATING OR STABILIZING ANY EXISTING POLES WHICH MAY BE DISTURBED BY CONSTRUCTION. THIS WORK SHAILL BE DONE AT NO COST TO OWNER.
29. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY ASSOCIATED WITH THE WORK UNDER THIS PROJECT AND FOR COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL HEALTH AND SAFETY LAWS, CODES, REGULATIONS AND ORDINANCES INCLUDING BUT NOT LIMITED TO THOSE CURRENTLY MANDATED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
30. CONTRACTOR SHALL USE ADEQUATE SHORING METHODS TO ENSURE:
    A. COMPLIANCE WITH OSHA REGULATIONS.
    B. PROTECTION OF EXISTING PAVEMENT AND ROAD SHOULDERS.
    C. CONSTRUCTION ACTIVITIES ARE CONFINED TO RIGHTS-OF-WAY OR EASEMENTS AS INDICATED.
31. ALL HOLES, TRENCHES AND OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY BARRICADES, LIGHTS OR OTHER PROTECTIVE DEVICES AS REQUIRED.
32. SEE SPECIFICATION SECTION 312316 FOR BLASTING REQUIREMENTS. ALL EXCAVATION, INCLUDING ROCK EXCAVATION, IS UNCLASSIFIED.
33. TESTING, CLEANING AND DISINFECTION:
    A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING PROVISIONS FOR TEST SECTIONS AND/OR OTHER FACILITIES REQUIRED FOR TESTING THE PIPE LINE. SUCH FACILITIES WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE PIPE.
    B. SEPARATE PRESSURE TESTS WILL BE REQUIRED FOR EACH VALVED SECTION.
    C. SEE SPECIFICATION SECTION 330300 AND 331300 FOR ADDITIONAL INFORMATION.
34. THE CONTRACTOR SHALL RECORD AND SUPPLY TO THE ENGINEER THE FOLLOWING INFORMATION:
    A. "AS-BUILT" PLAN AND PROFILE OF THE PIPE LINE, BENDS, VALVES, BLOW-OFFS, AIR RELEASE VALVES, AND BORES/HDD.
    B. ACCURATELY MEASURED LINEAR FEET OF PIPE INSTALLED, INCLUDING PRECISE LOCATIONS OF RESTRAINED JOINT PIPING.
    C. THE LOCATION OF ALL UTILITIES CROSSED AND THE NEW LOCATION AND DEPTH OF ALL RELOCATED AND/OR ADJUSTED UTILITIES.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
6/4/2015	LEVEL 3 DESIGN DOCUMENTS		SNP	JRM	SMS
	LEVEL 2 DESIGN DOCUMENTS		SNP	JRM	SMS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

GENERAL SYMBOLS, GENERAL ABBREVIATIONS, AND GENERAL NOTES

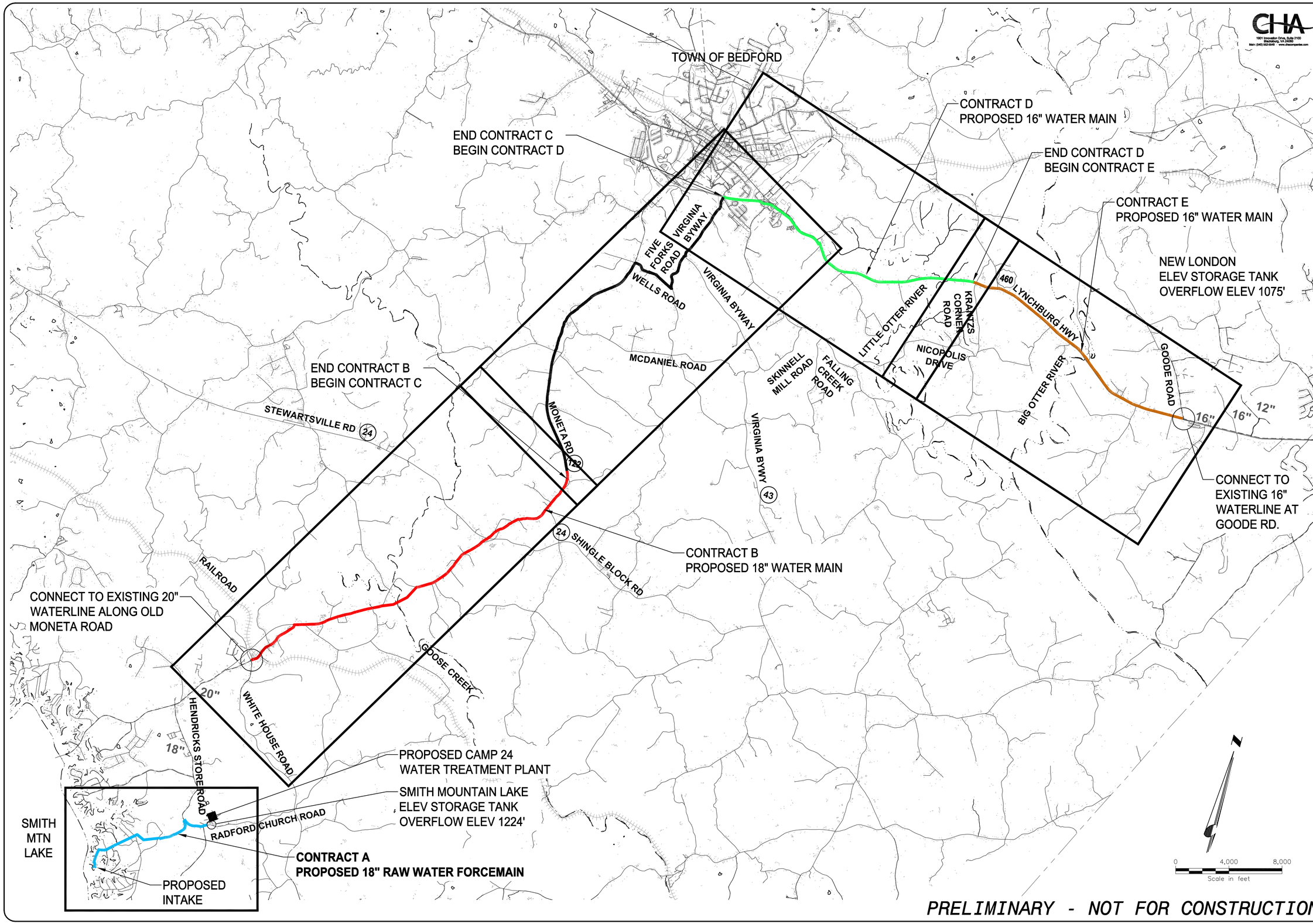
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-001
SHEET
OF

File: V:\PROJECTS\VA\Y\K3\27872\CADD_ACAD\C-00-001_27872.DWG
Saved: 5/28/2015 11:16:28 AM Plotted: 6/4/2015 6:22:48 AM User: Parks, Sarah LastSavedBy: 5415
FD7000
D7000



PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
6/4/2015	LEVEL 3 DESIGN DOCUMENTS		SNP	JRM	SMS
	LEVEL 2 DESIGN DOCUMENTS		SNP	JRM	SMS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

OVERALL WATER MAIN PLAN

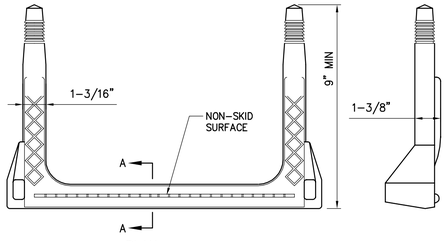
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-101
SHEET
OF

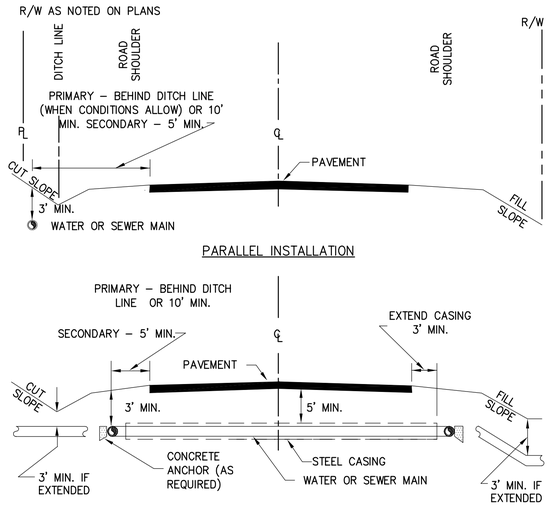
File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-00-101_27872.DWG
Saved: 4/1/2015 10:21:52 AM Plotted: 6/4/2015 6:23:20 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



NOTES:

1. ALL STEPS MUST CONFORM TO ASTM C-478 AND AASHTO M-199.
2. POLYPROPYLENE SHALL CONFORM TO ASTM D-4101.
3. DEFORMED STEEL REINFORCING BAR SHALL CONFORM TO ASTM A-615.
4. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME SIZE AND DESIGN. MIXING OF UNMATCHED STEPS WITHIN THE SAME MANHOLE WILL NOT BE PERMITTED.

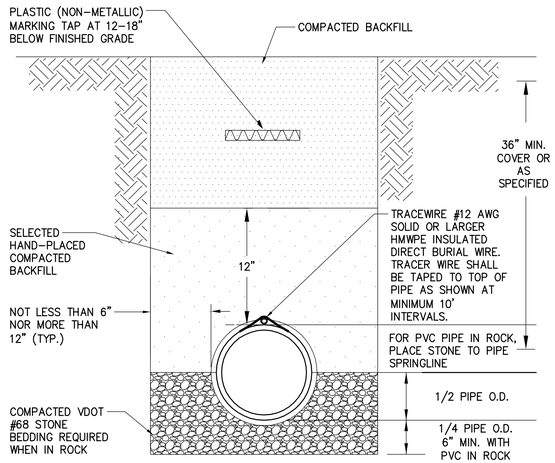
1 STANDARD MANHOLE STEP
NOT TO SCALE



NOTES:

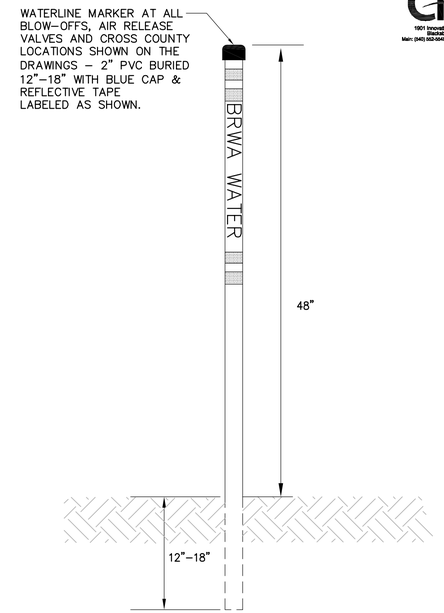
1. PLACE VALVES AS NOTED ON PLAN.
2. VERIFY LOCAL REQUIREMENTS WITH VDOT RESIDENCY.
3. LINE PLACEMENT WITHIN R.O.W. SHALL BE REVIEWED ON A CASE BY CASE BASIS.
4. NOT TO SCALE

2 TYPICAL WATER OR SEWER MAIN LOCATION WITHIN V.D.O.T RIGHT OF WAY
NOT TO SCALE



NOTE: THIS DETAIL APPLICABLE FOR DEPTHS LESS THAN 14 FEET. SEE PLANS FOR MODIFICATIONS IN DEEPER TRENCHES.

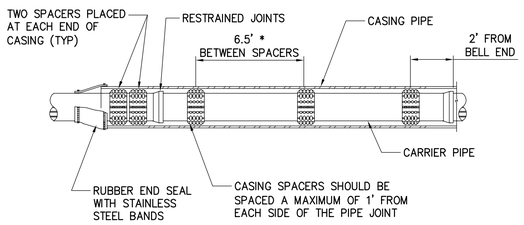
3 PRESSURE MAIN TRENCH BED
NOT TO SCALE



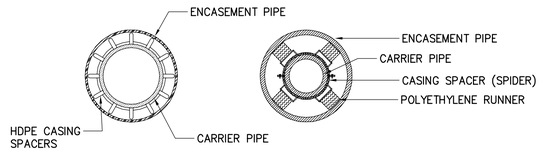
4 WATER MARKER DETAIL
NOT TO SCALE

NOTES:

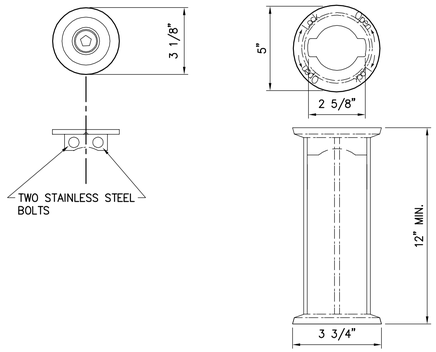
1. SPACERS SHALL BE RACI HDPE, SPIDER OR EQUIVALENT.
2. SPACERS SHALL BE SPACED 6 1/2' ON SEWER PIPE.
3. CARRIER PIPE SHALL BE DUCTILE, HDPE, OR PVC IN ACCORDANCE WITH THE SPECIFICATIONS.
4. ENCASEMENT PIPE TO BE IN ACCORDANCE WITH SPECIFICATIONS AND VDOT REQUIREMENTS.
5. CONCRETE ENCASEMENT PIPE WILL NOT BE ALLOWED.
6. DIAMETER OF CASING PIPE PER SPECIFICATIONS OR AS OTHERWISE APPROVED BY AUTHORITY.



* ADDITIONAL SPACING ALLOWED AS RECOMMENDED BY PIPE MANUFACTURER.



5 SEALED CASINGS INSTALLATION
NOT TO SCALE



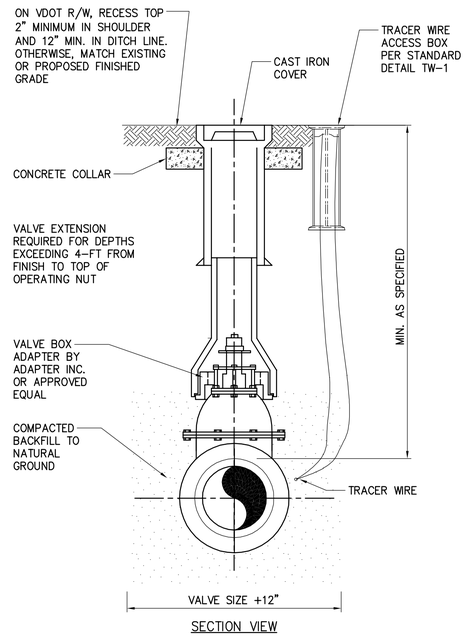
NOTES:

1. CAST IRON TRACER WIRE ACCESS BOX SHALL BE AS MANUFACTURED BY DRAINAGE & WATER SOLUTIONS, INC. OR APPROVED EQUAL AS FOLLOWS.:

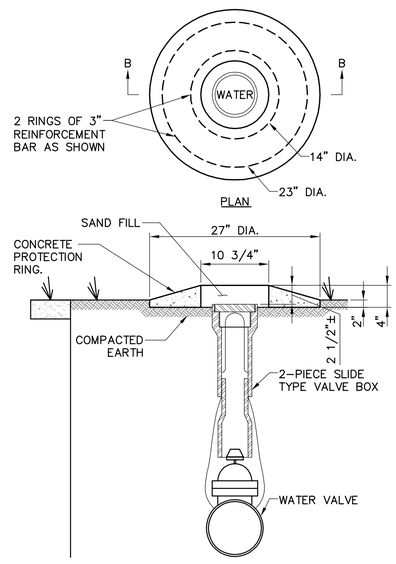
   MODEL # LMKTWAB - WATER TRACER WIRE ACCESS BOX
   MODEL # LMKSEWAB - SEWER TRACER WIRE ACCESS BOX

2. ADJUSTABLE CAST IRON TRACER WIRE ACCESS BOXES SIMILAR TO MODELS TWABADJ18 AND SEWABADJ18 BY DRAINAGE & WATER SOLUTIONS, INC. SHALL BE USED IN NEW DEVELOPMENTS WHERE FINAL GRADE ADJUSTMENTS ARE EXPECTED.
3. TRACER WIRE ACCESS BOX SHALL BE INSTALLED AT ALL WATER & SEWER APPURTENANCES. WHERE MULTIPLE ITEMS ARE IN CLOSE PROXIMITY TO EACH OTHER, THE NUMBER AND LOCATION OF TRACER WIRE ACCESS BOXES SHALL BE AS DIRECTED BY THE AUTHORITY INSPECTOR.
4. TRACER WIRE ACCESS BOX SHALL BE INSTALLED A MAXIMUM OF 12-INCHES HORIZONTAL DISTANCE FROM APPURTENANCE.
5. TRACER WIRE SHALL BE #12 AWG SOLID OR LARGER HMWPE INSULATED DIRECT BURIAL WIRE.
6. TRACER WIRE SHALL BE ABLE TO EXTEND A MINIMUM OF18-INCHES OUTSIDE THE TOP OF THE TRACER WIRE ACCESS BOX.

6 TRACER WIRE ACCESS BOX
NOT TO SCALE



7 2-PIECE VALVE BOX INSTALLATION
NOT TO SCALE



NOTES:

1. TOTAL WEIGHT OF PROTECTIVE RING IS 115 LBS (MIN.).

8 VALVE BOX PROTECTION DETAIL
NOT TO SCALE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

CONSTRUCTION DETAILS - SHEET 1 OF 3

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

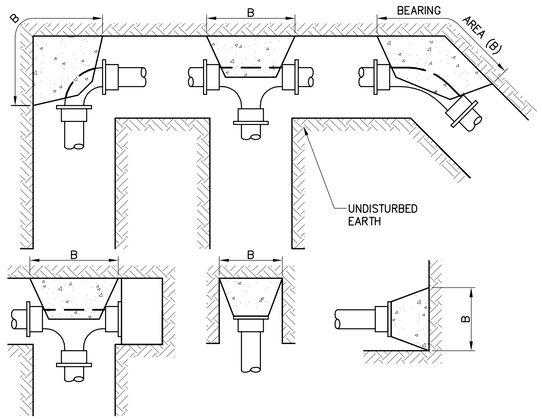
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-501
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-00-501_27872.DWG
Saved: 6/3/2015 10:16:03 AM Plotted: 6/4/2015 6:24:00 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
DT000



1. THESE DETAILS APPLY TO BOTH VERT AND HORIZ LAID PIPE.

2. POURED IN PLACE CONC SHALL BE 3000 PSI MIN.

3. LEAVE JOINTS CLEAR OF CONC FOR EASY ACCESS TO HARDWARE.

4. POLYETHYLENE SHALL BE WRAPPED AROUND FITTINGS WHERE CONC BLOCKING WILL EVENTUALLY BE REMOVED.

5. UNDISTURBED EARTH IS ANTICIPATED TO BE SOFT CLAY W/AN ALLOWABLE BEARING CAPACITY OF 2000 PSF.

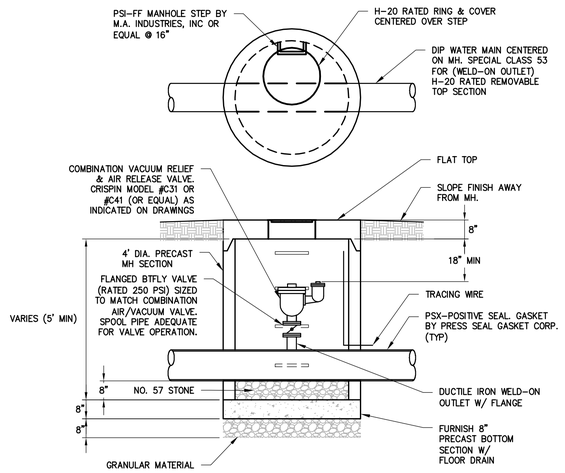
6. FITTING FACTORS:

TEE & END	= 2.00
90°	= 1.41
45°	= 0.77
22½°	= 0.39
11¼°	= 0.20

REQ'D AREA OF BLOCK FACE EARTH BEARING SHALL BE DETERMINED AS FOLLOWS:

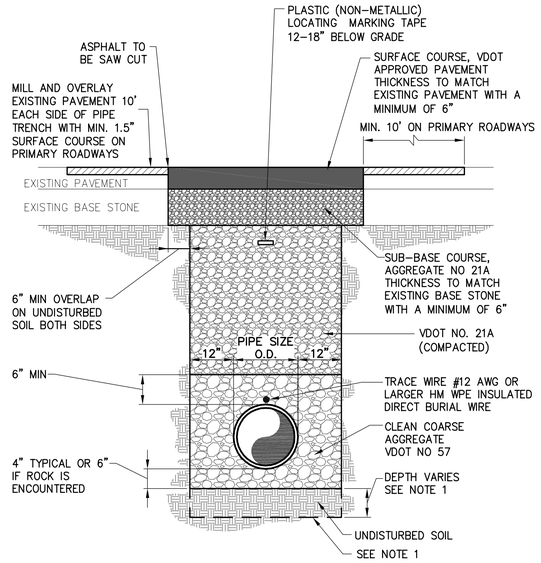
WHERE:
B = P A C / 2000
B = AREA OF BLOCK FACE (FT2)
A = CROSS SECTION AREA OF PIPE (SQ IN)
P = HYDROSTATIC TEST PRESSURE, PSI
C = FITTING FACTOR

1 THRUST BLOCK DETAIL
NOT TO SCALE

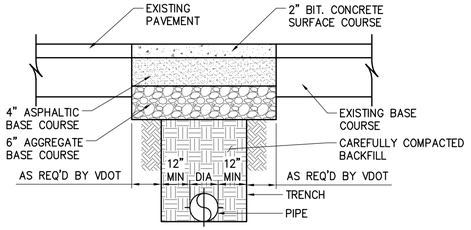


NOTES:
1. TRANSITION PIPE LEADING UP TO AND AWAY FROM AIR RELEASE VALVE SO AIR RELEASE VALVE IS LOCATED AT HIGH POINT IN LINE. DEPTH OF WATER LINE MAY EXCEED 4 FEET OF COVER IN THESE TRANSITIONS.
2. ALL PIPE NIPPLES SHALL BE BRASS.

2 3"/4" AIR RELEASE/VACUUM RELIEF VALVE DETAIL
NOT TO SCALE

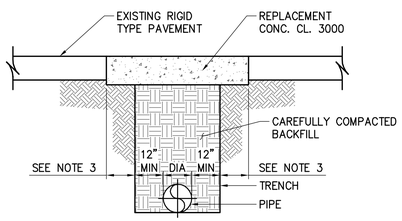


3 TRENCH DETAIL FOR WATERLINE UNDER PAVED ROAD
NOT TO SCALE



NOTES:
1. EXISTING PAVEMENT SHALL BE CUT WITH A SAW.
2. BACKFILL FULL DEPTH OF TRENCH UNDER DRIVEWAYS WITH ABC.

4 ASPHALT DRIVEWAY REPLACEMENT DETAIL
NOT TO SCALE



NOTES:
1. EXISTING PAVEMENT SHALL BE CUT WITH A SAW.
2. ALL REPLACEMENT CONCRETE SHALL BE 2" THICKER THAN EXISTING CONCRETE, MIN 6".
3. WHERE IT IS NECESSARY TO TRENCH ACROSS CONCRETE PAVEMENT OR CONCRETE BASE PAVEMENT. A SECTION OF PAVEMENT OF MINIMUM WIDTH OF TEN FEET SYMMETRICAL ABOUT THE CENTERLINE OF THE TRENCH SHALL BE REMOVED AND REPLACED WITH NEW CONCRETE. WHERE THE EDGE OF THE REMOVED PAVEMENT IS LESS THAN TEN FEET FROM A TRANSVERSE EXPANSION OR CONTRACTION JOINT OR CRACK, THE ENTIRE SECTION OF PAVEMENT SHALL BE REMOVED UP TO THE JOINT OR CRACK AND REPLACED WITH NEW CONCRETE.

5 CONCRETE DRIVEWAY REPLACEMENT DETAIL
NOT TO SCALE

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
DATE
6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:
SAVED:
PLOTTED:
USER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONSTRUCTION DETAILS - SHEET 2 OF 3

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

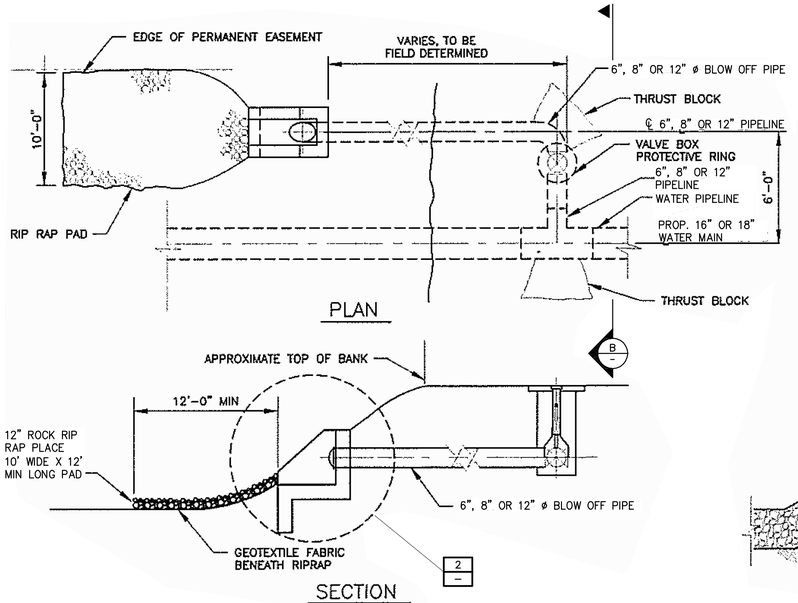
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

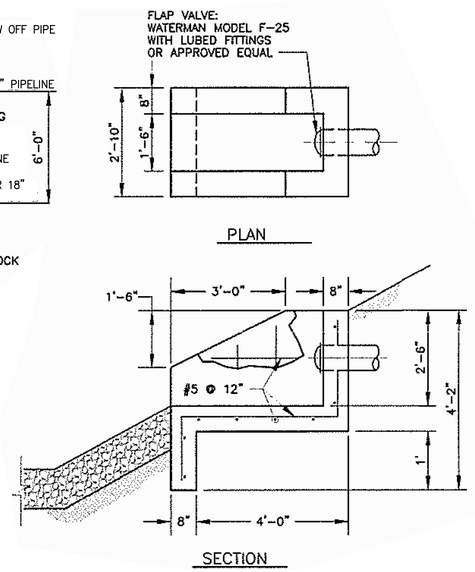
C-00-502
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-00-502_27872.DWG
Saved: 6/2/2015 7:28:10 AM Plotted: 6/4/2015 6:24:26 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
DT000

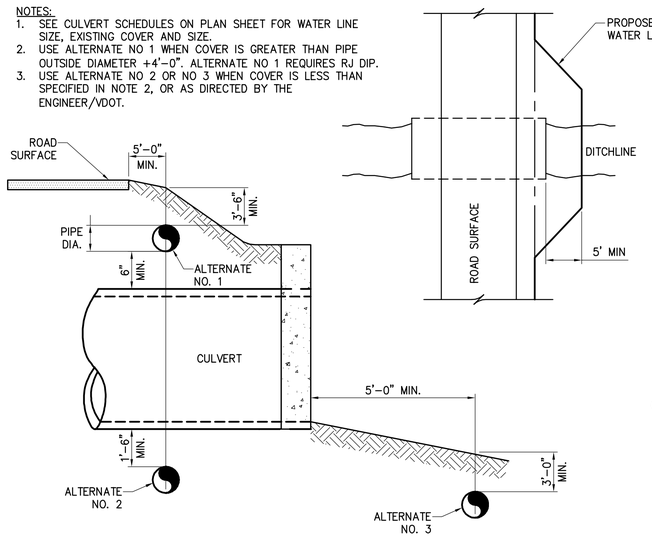


1 BLOW-OFF
NOT TO SCALE

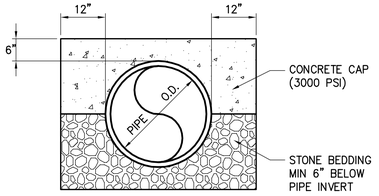


2 CONCRETE HEADWALL
NOT TO SCALE

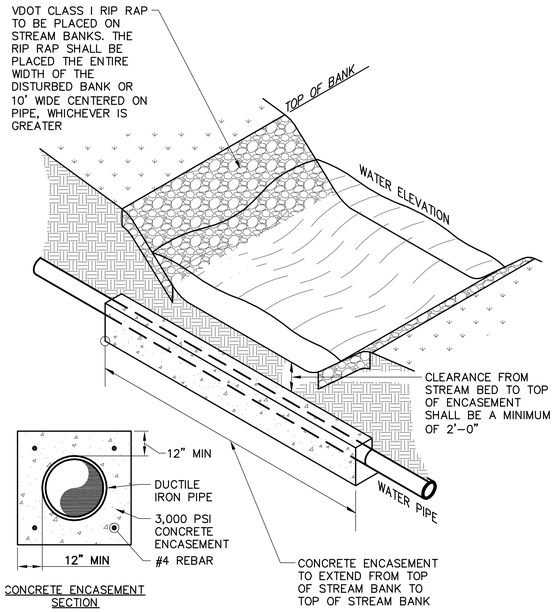
NOTES:
1. SEE CULVERT SCHEDULES ON PLAN SHEET FOR WATER LINE SIZE, EXISTING COVER AND SIZE.
2. USE ALTERNATE NO 1 WHEN COVER IS GREATER THAN PIPE OUTSIDE DIAMETER +4'-0". ALTERNATE NO 1 REQUIRES RJ DIP.
3. USE ALTERNATE NO 2 OR NO 3 WHEN COVER IS LESS THAN SPECIFIED IN NOTE 2, OR AS DIRECTED BY THE ENGINEER/VDOT.



3 CULVERT ENCROACHMENT DETAIL
NOT TO SCALE

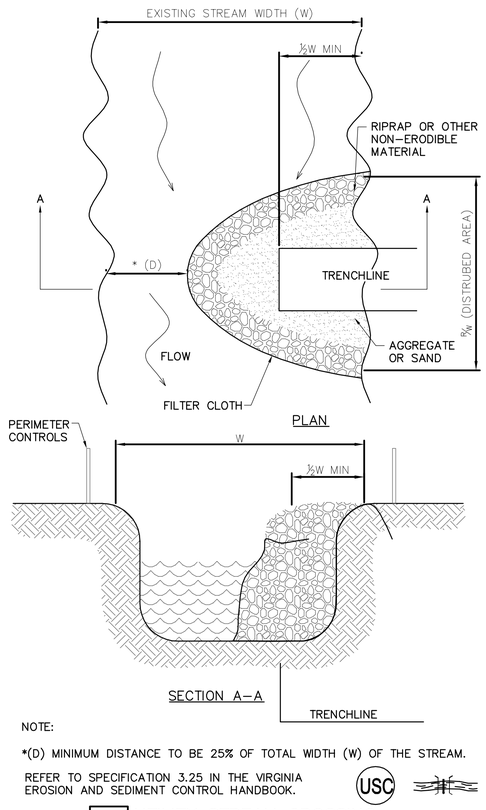


4 CONCRETE CAP DETAIL
NOT TO SCALE



NOTES:
1. CONCRETE TO BE 3,000 PSI.
2. ENCASEMENT TO BE USED ONLY WHERE SPECIFIED ON PLANS
3. PIPE SHALL BE DUCTILE IRON
4. FILTER FABRIC TO BE PLACED UNDER RIP-RAP AND KEYED INTO EMBANKMENT.

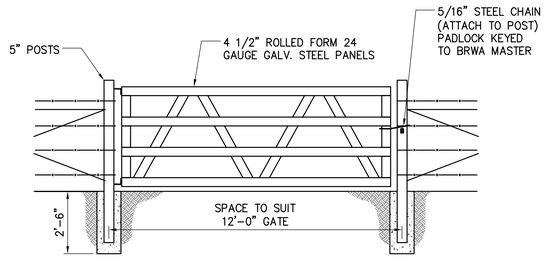
5 WATERLINE STREAM CROSSING
NOT TO SCALE



NOTE:
*(D) MINIMUM DISTANCE TO BE 25% OF TOTAL WIDTH (W) OF THE STREAM.

REFER TO SPECIFICATION 3.25 IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

6 UTILITY STREAM CROSSING
NOT TO SCALE



7 FARM GATE
NOT TO SCALE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONSTRUCTION DETAILS - SHEET 3 OF 3

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

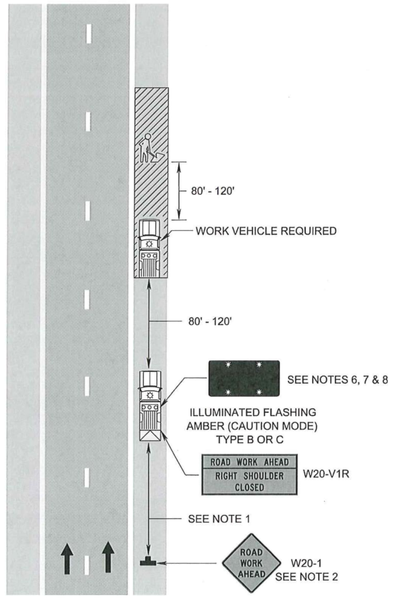
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-503
SHEET
OF

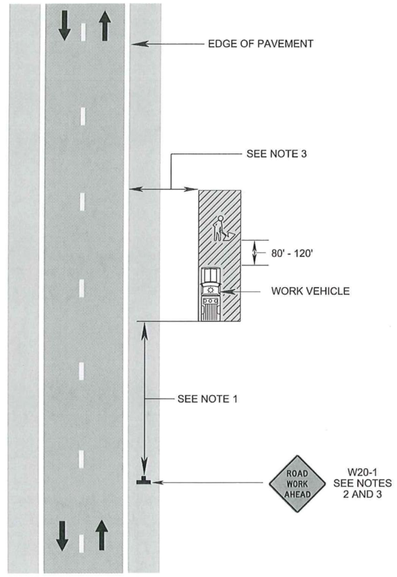
File: V:\PROJECTS\VAN*VA3\27872\CADD_ACAD\C-00-503_27872.DWG
Saved: 4/1/2015 10:23:08 AM Plotted: 6/4/2015 6:24:53 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000

Mobile or Short Duration Shoulder Operation
(Figure TTC-3.0)



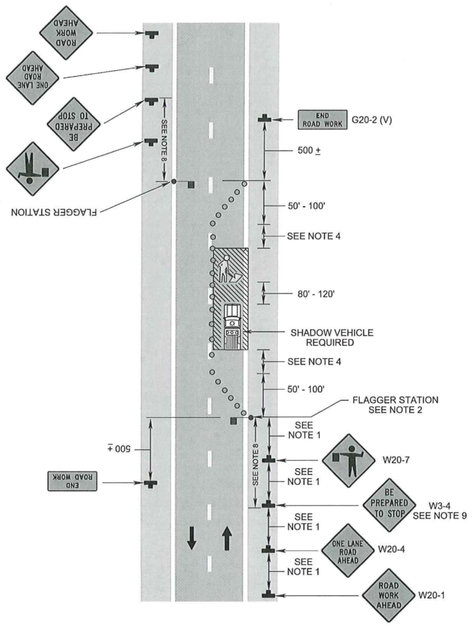
1 MOBILE OR SHORT DURATION SHOULDER OPERATION DETAIL
SCALE: N.T.S.

Work Beyond the Shoulder Operation
(Figure TTC-1.0)



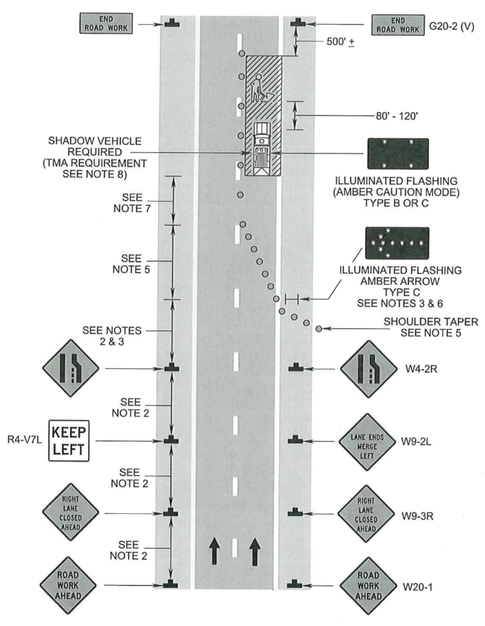
2 WORK BEYOND THE SHOULDER OPERATION DETAIL
SCALE: N.T.S.

Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.0)



3 LANE CLOSURE ON A TWO-LANE ROADWAY USING FLAGGERS DETAIL
SCALE: N.T.S.

Outside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-16.0)



4 OUTSIDE LANE CLOSURE OPERATION ON A FOUR-LANE ROADWAY DETAIL
SCALE: N.T.S.

NOTES:

1. THE VDOT FIGURES ON THIS DRAWING ARE PROVIDED AS REPRESENTATIVE EXAMPLES AND ARE FOR REFERENCE ONLY. ALL WORK CONDUCTED WITHIN VDOT RIGHTS-OF-WAY SHALL BE IN FULL COMPLIANCE WITH:
   - VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
   - VIRGINIA WORK AREA PROTECTION MANUAL STANDARDS AND GUIDELINES FOR TEMPORARY TRAFFIC CONTROL

2. LANE CLOSURES WILL BE TIME OF DAY LIMITED AS REQUIRED BY VDOT.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
6/1/2015

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

TRAFFIC CONTROL DETAILS

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-504
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-00-504_27872.DWG
Saved: 4/1/2015 10:23:27 AM Plotted: 6/4/2015 6:25:24 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
DT000

EROSION AND SEDIMENT CONTROL NARRATIVE:

PROJECT DESCRIPTION

'CONTRACT A' CONSISTS OF 15,000 LINEAR FEET OF 18" DIAMETER PVC & DIP RAW WATER LINE FROM THE PROPOSED INTAKE TO THE PROPOSED WATER TREATMENT PLANT. PIPELINE WILL GENERALLY FOLLOW LAKEWOOD DRIVE, HIGHPOINT ROAD, HICKORY COVE LANE (ROUTE 654), AND RADFORD CHURCH ROAD (ROUTE 654). THE PIPE BEDDING WILL BE NATIVE SOILS, GRANULAR BEDDING & IMPORTED BACKFILL.

'CONTRACT B' CONSISTS OF 36,000 LINEAR FEET OF 18" DIAMETER PVC & DIP WATER MAIN FROM THE INTERSECTION OF WHITEHOUSE ROAD AND OLD MONETA ROAD (ROUTE 903) UNTIL IT CONNECTS TO 'CONTRACT C' AT THE INTERSECTION OF NOLANS DRIVE (ROUTE 868). THE PIPE BEDDING WILL BE NATIVE SOULS, GRANULAR BEDDING & IMPORTED BACKFILL.

'CONTRACT C' CONSISTS OF 35,200 LINEAR FEET OF 18" DIAMETER PVC & DIP WATER MAIN FROM THE INTERSECTION OF NOLANS DRIVE (ROUTE 868) AND MONETA ROAD (ROUTE 122) UNTIL IT CONNECTS TO 'CONTRACT D' AT THE INTERSECTION OF SOUTH STREET (ROUTE 43) AND DR. MARTIN LUTHER KING JR. BYPASS (ROUTE 460). THE PIPE BEDDING WILL BE NATIVE SOULS, GRANULAR BEDDING & IMPORTED BACKFILL.

'CONTRACT D' CONSISTS OF 20,542 LINEAR FEET OF 18" DIAMETER PVC & DIP WATER MAIN FROM THE INTERSECTION OF SOUTH STREET (ROUTE 43) AND DR. MARTIN LUTHER KING JR. BYPASS (ROUTE 460) UNTIL IT CONNECTS TO 'CONTRACT E' AT THE INTERSECTION OF EAST LYNCHBURG SALEM TURNPIKE (ROUTE 460) AND KRANTZ'S CORNER ROAD (ROUTE 715). THE PIPE BEDDING WILL BE NATIVE SOULS, GRANULAR BEDDING & IMPORTED BACKFILL.

CONTRACT E CONSISTS OF 23,278 LINEAR FEET OF 18" DIAMETER PVC & DIP WATER MAIN FROM THE INTERSECTION OF EAST LYNCHBURG SALEM TURNPIKE (ROUTE 460) AND KRANTZ'S CORNER ROAD (ROUTE 715) UNTIL IT TERMINATES AT THE INTERSECTION OF EAST LYNCHBURG SALEM TURNPIKE (ROUTE 460) AND GOODE ROAD (ROUTE 668). THE PIPE BEDDING WILL BE NATIVE SOULS, GRANULAR BEDDING & IMPORTED BACKFILL.

EXISTING SITE CONDITIONS:

THE PROPOSED RAW WATER AND WATER MAINS WILL BE LOCATED IN BEDFORD COUNTY VIRGINIA AND THE TOWN OF BEDFORD VIRGINIA. THE PIPELINES WILL GENERALLY BE LOCATED IN AND ADJACENT TO VDOT RIGHT OF WAYS. AREAS WILL CONSIST OF GRASS SWALES AND DITCHES, GRAVELED SHOULDERS, ASPHALT ROAD CROSSINGS, AND STREAM AND RIVER CROSSINGS. TERRAIN IS MOSTLY GRASSED WITH SOME VEGETATION.

ADJACENT PROPERTY:

ADJACENT PROPERTIES WILL BE A MIX OF VDOT ROADWAYS, RESIDENTIAL PROPERTIES, COMMERCIAL PROPERTIES, AND AGRICULTURAL PROPERTIES IN THE COUNTY AND TOWN OF BEDFORD VIRGINIA.

OFF-SITE AREAS:

THIS PROJECT WILL RESULT IN A "BALANCED" SITE AND NO EXCESS MATERIAL WILL BE EXPORTED NOR WILL ANY MATERIAL BE IMPORTED FROM OTHER PROPERTIES. IF OFF-SITE AREAS ARE REQUIRED THE LOCATION OF ALL OFF-SITE FILL, BORROW, STOCKPILE, AND/OR STAGING AREAS ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT SHALL BE PROVIDED TO THE OWNER/ENGINEER PRIOR TO THE PRE-CONSTRUCTION MEETING. CONTRACTOR WILL BE REQUIRED TO OBTAIN PERMIT(S) FOR ANY OFFSITE AREAS UTILIZED FOR CONSTRUCTION.

SOILS:

SEE PROJECT EROSION AND SEDIMENT CONTROL NARRATIVE "ATTACHED".

CRITICAL EROSION AREAS:

CRITICAL AREAS INCLUDE CULVERTS AND AREAS DOWNHILL FROM THE PROPOSED DISTURBANCE. THE PROPOSED EROSION AND SEDIMENT CONTROL MEASURES ARE INTENDED TO MINIMIZE ANY POTENTIAL PROBLEMS AND PROMOTE STABILIZATION.

EROSION AND SEDIMENT CONTROL MEASURES – GENERAL: ALL STRUCTURAL AND VEGETATIVE EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" (VESCH), LATEST EDITION.

MINIMUM STANDARDS: ALL APPLICABLE MINIMUM STANDARDS SHOULD BE ADDRESSED:

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDE AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN FOURTEEN (14) DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
2. PERIMETER DIKES AND DITCHES, SEDIMENT BARRIERS, AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE LAND DISTURBANCE TAKES PLACE.
3. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DITCHES, AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
4. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY (VEHICULAR) TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
5. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY (30) DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM ADMINISTRATOR. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

STRUCTURAL PRACTICES

1. TEMPORARY STONE CONSTRUCTION ENTRANCE – STD. & SPEC. 3.02

   Temporary stone construction entrance shall be installed as shown on the plans to reduce the amount of soil transported onto public roads or other paved areas.

   Sequence of Installation: Prior to any land disturbance
   Maintenance: Refer to Std. & Spec. 3.02
   Removal Event: Immediately prior to paving

2. STORM DRAIN INLET PROTECTION – STD. & SPEC. 3.07

   Storm drain inlet protection shall be placed at existing and proposed grate inlets to prevent sediment from entering the storm piping.

   Sequence of Installation: Existing structures – prior to any land disturbance
   Future structures – immediately following installation
   Maintenance: Refer to Std. & Spec. 3.07
   Removal Event: Following permanent stabilization of all upland areas

3. CULVERT INLET PROTECTION – STD. & SPEC. 3.08

   Culvert inlet protection shall be installed and consist of a sediment filter located at the inlet to storm sewer culverts, which prevents sediment from entering, accumulating in and being transferred by the culvert. It provides erosion control at culverts during the phase of the project where elevations and drainage patterns are changing, causing original control measures to be ineffective.

   Sequence of Installation: Existing structures – prior to any land disturbance
   Future structures – immediately following installation
   Maintenance: Refer to Std. & Spec. 3.08
   Removal Event: Following permanent stabilization of all upland areas

4. STORMWATER CONVEYANCE CHANNEL (SCC) – STD. & SPEC. 3.17

   Permanent SCCs are proposed to provide adequate channel to convey runoff, and shall be constructed in accordance with the plans, specifications, and engineering design calculations.

   Sequence of Installation: As part of grading activities
   Maintenance: Refer to Std. & Spec. 3.17
   Removal Event: This is permanent and shall not be removed.

5. OUTLET PROTECTION – STD. & SPEC. 3.18

   Structurally lined aprons or other acceptable energy dissipating devices placed at the outlets of pipes or paved channel sections, used to prevent scour at stormwater outlets, to protect the outlet structure and to minimize the potential for downstream erosion by reducing the velocity and energy of concentrated stormwater flows.

   Sequence of Installation: Existing structures – prior to any land disturbance
   Future structures – immediately following installation
   Maintenance: Refer to Std. & Spec. 3.18
   Removal Event: This is permanent and shall not be removed.

6. ROCK CHECK DAMS – STD. & SPEC 3.20

   Small temporary stone dams constructed across a swale or drainage ditch in order to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch and trap sediment from adjacent areas.

   Sequence of Installation: As part of grading activities
   Maintenance: Refer to Std. & Spec. 3.20
   Removal Event: Unless indicated as permanent, remove following permanent stabilization of the site.

VEGETATIVE PRACTICES

GENERAL: A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED BY PAVEMENT. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM AND MATURE ENOUGH TO SURVIVE AND INHIBIT EROSION. NEW VEGETATION SHALL BE MAINTAINED AT A MINIMUM OF ONE FULL YEAR AFTER PLANTING. NEW SEEDING SHALL BE SUPPLIED WITH ADEQUATE MOISTURE, ESPECIALLY LATE IN THE SEASON, AND IN ABNORMALLY HOT OR DRY WEATHER. STABILIZATION PRACTICES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE APPROPRIATE VESCH STANDARD AND SPECIFICATION AND THE EROSION AND SEDIMENT CONTROL PLAN.

PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 14 DAYS. PE14ANENT SEEDING SHALL BE USED ON ALL AREAS THAT ARE NOT AT FINAL GRADE AND THAT WILL BE LEFT DORMANT FOR A PERIOD OF MORE THAN 1 YEAR.

1. TEMPORARY SEEDING – STD. & SPEC. 3.31

   Temporary seeding shall be applied over denuded areas within 7 days for areas that will not be brought to final grade within 30 days. Temporary seeding mixes shall be as described on the detail drawings.

   Sequence of Installation: When cleared areas will not be brought to final grade within 30 days
   Maintenance: Refer to Std. & Spec. 3.31; areas which fail to establish vegetative cover adequate to prevent rill erosion are to be reseeded.
   Removal Event: As needed for final grading.

EROSION AND SEDIMENT CONTROL NARRATIVE (CONT'D):

2. PERMANENT SEEDING – STD. & SPEC. 3.32

   Permanent seeding shall also be used on all areas that are not at final grade and that will be left dormant for a period of more than 1 year. If conflicts exist between the project specifications and the VESCH Std. & Spec. 3.32, the more stringent requirement shall apply. Permanent seeding mixes and rates are found on this sheet.

   Sequence of Installation: Within 7 days of achieving final grade or as noted above
   Soil Testing Requirements: Refer to Std. & Spec. 3.32
   Maintenance: Refer to Std. & Spec. 3.32; areas which fail to establish vegetative cover adequate to prevent rill erosion are to be immediately reseeded, following identification of the cause of poor germination.

PERMANENT STABILIZATION

ALL NON-PAVED AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. SEEDING SHALL BE IN ACCORDANCE WITH STD. & SPEC. 3.32, PERMANENT SEEDING. SEED TYPE SHALL BE AS SPECIFIED FOR "MINIMUM CARE LAWNS" AND "GENERAL SLOPES" IN THE HANDBOOK. MULCH (STRAW OR FIBER) SHALL BE USED ON ALL SEEDED SURFACES. IN ALL SEEDING OPERATIONS SEED, FERTILIZER AND LIME SHALL BE APPLIED PRIOR TO MULCHING.

MANAGEMENT STRATEGIES

1. CONSTRUCTION SHALL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
2. ISOLATE TRENCHING FOR UTILITIES AND DRAINAGE FROM DOWNSTREAM CONVEYANCES IN ORDER TO MINIMIZE PERIMETER CONTROLS.
3. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN SEVEN (7) DAYS OF ACHIEVING FINAL GRADE.
4. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE MAINTAINED UNTIL THEY ARE NO LONGER REQUIRED TO COMPLY WITH THE CONTRACT DOCUMENTS OR STATE LAW. ONLY AFTER INSPECTION AND APPROVAL FROM THE VESCP AUTHORITY MAY ITEMS BE REMOVED FOLLOWING THE STABILIZATION OF CONTRIBUTING AREAS.

INSPECTIONS

THE GENERAL CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND THE AREA OF CONSTRUCTION VEHICLE ACCESS AT LEAST EVERY FOURTEEN (14) CALENDAR DAYS, AND WITHIN FORTY-EIGHT (48) HOURS OF THE END OF A STORM EVENT PRODUCING 1/4" OR GREATER OF PRECIPITATION. WHERE AREAS HAVE BEEN FINALLY OR TEMPORARILY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS (SITE IS COVERED WITH SNOW, ICE, OR FROZEN GROUND EXISTS) SUCH INSPECTIONS SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH.

INSPECT DISTURBED AREAS AND AREAS OF MATERIALS STORAGE THAT ARE EXPOSED TO PRECIPITATION FOR EVIDENCE OF, OR THE POTENTIAL FOR SEDIMENT ENTERING THE STORM DRAIN SYSTEM. INSPECT E&S CONTROLS IN ACCORDANCE WITH REQUIREMENTS STATED HEREIN, AND INSPECT POINTS OF STORM DRAIN DISCHARGE FOR EXCESSIVE SEDIMENTATION. CORRECT SITE CONTROLS AS REQUIRED TO REDUCE SEDIMENTATION OF STORM DRAINS, CULVERTS, AND RECEIVING CHANNELS.

IF CONTROLS OR SEDIMENT PREVENTION AREAS ARE FOUND TO BE IN NEED OF REPAIR OR MODIFICATION, THE GENERAL CONTRACTOR SHALL PROVIDE ADDITIONAL MEASURES OR MODIFICATIONS TO EXISTING MEASURES AS REQUIRED. ANY ADDITIONAL MEASURES OR MODIFICATIONS TO EXISTING MEASURES SHALL BE RECORDED AS FIELD REVISIONS TO THESE PLANS. IN THE EVENT THAT ADDITIONAL CONTROLS ARE FOUND TO BE REQUIRED, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THESE CONTROLS BEFORE THE NEXT ANTICIPATED STORM EVENT. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICAL, THEY SHALL BE IMPLEMENTED AS SOON AS PRACTICAL.

A REPORT SUMMARIZING THE SCOPE OF INSPECTIONS, NAME OF INSPECTOR, INSPECTOR'S QUALIFICATIONS, DATES OF INSPECTIONS, MAJOR OBSERVATIONS PERTAINING TO THE IMPLEMENTATION OF THESE EROSION CONTROL PLANS, AND ACTIONS TAKEN SHALL BE MADE AND RETAINED AS A PART OF THESE PLANS. MAJOR OBSERVATIONS OF THESE REPORTS SHALL INCLUDE: THE LOCATIONS OF EXCESSIVE SEDIMENTATION FROM THE SITE; LOCATIONS OF CONTROLS IN NEED OF REPAIR; LOCATIONS OF FAILED OR INADEQUATE CONTROLS; AND LOCATIONS WHERE ADDITIONAL CONTROLS ARE NEEDED.

STORMWATER MANAGEMENT

A NEW STORMWATER BIORETENTION BASIN WILL BE INSTALLED TO TREAT RUNOFF FROM NEW IMPERVIOUS FEATURES RELATED TO THE ATAD FACILITY AND RELOCATED ENTRANCE ROAD. ALL OTHER AREAS, EXISTING DRAINAGE PATTERNS WILL BE MAINTAINED DURING POST CONSTRUCTION OF THIS PROJECT. EXISTING DRAINAGE FEATURE CAPACITIES ARE ADEQUATE AND NO IMPACTS TO EXISTING DRAINAGE INFRASTRUCTURE ARE ANTICIPATED WITH THE CONSTRUCTION OF THIS PROJECT. SEE SWM CALCULATIONS (ATTACHED UNDER SEPARATE COVER).

ENVIRONMENTAL INVENTORY

THERE ARE NOT TIDAL SHORES, WETLANDS, NON-TIDAL WETLANDS, RESOURCE PROTECTION AREAS OR HYDRIC SOILS ASSOCIATED WITH THIS PROJECT SITE. SLOPES IN EXCESS OF 25% DO EXIST ON-SITE BUT NOT IN AREAS WHERE CONSTRUCTION ACTIVITIES ARE ANTICIPATED.

GENERAL EROSION AND SEDIMENT CONTROL NOTES:

ES-1: UNLESS OTHERWISE INDICATED, CONSTRUCT AND MAINTAIN ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.

ES-2: VESCP AUTHORITY INSPECTORS WILL MAKE A CONTINUING REVIEW AND EVALUATION OF THE METHODS AND EFFECTIVENESS OF THE E.S.C. PLAN.

ES-3: PLACE ALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO OR AS THE FIRST STEP IN CLEARING, GRADING, OR LAND DISTURBANCE.

ES-4: MAINTAIN A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN ON THE SITE AT ALL TIMES.

ES-5: PRIOR TO COMMENCING LAND-DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFFSITE BORROW OR WASTE AREA), SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE ARCHITECT/ENGINEER FOR REVIEW AND ACCEPTANCE.

ES-6: PROVIDE ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

ES-7: ALL DISTURBED AREAS SHALL DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND-DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT.

ES-8: DURING DEWATERING OPERATIONS, PUMP WATER INTO AN APPROVED FILTERING DEVICE.

ES-9: INSPECT ALL EROSION CONTROL MEASURES DAILY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. MAKE ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES IMMEDIATELY.

ES-10: THE CONTRACTOR SHALL HAVE A RESPONSIBLE LAND DISTURBER ON-SITE AS REQUIRED.

EROSION & SEDIMENT CONTROL LEGEND

SYMBOL	VA. E&S HANDBOOK STANDARD	
CE	STONE CONSTRUCTION ENTRANCE – 3.02	
SF	SILT FENCE – 3.05	
IP	INLET PROTECTION – 3.07	
CIP	CULVERT INLET PROTECTION – 3.08	
CD	ROCK CHECK DAM – 3.20	
TO	TOPSOILING – 3.30	ALL DISTURBED GRASSED AREAS
TS	TEMPORARY SEEDING – 3.31	
PS	PERMANENT SEEDING –3.32	
MU	MULCHING – 3.35	

CONSTRUCTION SEQUENCING

1. INSTALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES.
2. CONSTRUCT PIPELINE.
3. STABALIZE ALL AFFECTED AREAS.
4. REMOVE TEMOPORARY EROSION SEDIMENT CONTROL MEASURES

(TS) TEMPORARY SEEDING SCHEDULE

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

PLANTING DATES	SPECIES	RATE (LBS/ACRE)
SEPT 1–FEB 15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50–100
FEB 16–APR 20	ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM)	60–100
MAY 1–AUG 31	GERMAN MILLET (SETARIA ITALICA)	50

SEEDINGS MADE IN FALL FOR WINTER COVER AND DURING HOT AND DRY SUMMER MONTHS SHALL BE MULCHED IMMEDIATELY UPON COMPLETION OF SEED APPLICATION WITH TACKIFIED STRAW, IN ACCORDANCE WITH VA E&S STD 3.35.

(PS) PERMANENT SEEDING SCHEDULE

GENERAL SLOPE (3:1 OR LESS)	TOTAL LBS PER ACRE
KENTUCKY 31 FESCUE	200 LBS.
KENTUCKY BLUEGRASS	10 LBS.
RED TOP GRASS	10 LBS.
SEASONAL NURSE CROP	30 LBS.
WHITE CLOVER	2 LBS.
	252 LBS.

SEASONAL NURSE CROP

MARCH, APRIL THROUGH MAY 15	ANNUAL RYE
MAY 16 THROUGH AUGUST 15	FOXTAIL MILLET
AUGUST 16 THROUGH SEPTEMBER,OCTOBER	ANNUAL RYE
NOVEMBER THROUGH FEBRUARY	WINTER RYE

LIME AND FERTILIZER NEEDS SHALL BE DETERMINED BY SOIL TESTS.

SEEDINGS TO BE MULCHED AT THE RATE OF 2 TONS PER ACRE WITH TACKIFIED STRAW, IMMEDIATELY UPON COMPLETION OF SEED APPLICATION, IN ACCORDANCE WITH VA E&S STD 3.35.

SEEDING SCHEDULES

MINIMUM STANDARDS

The following standards are to be provided or addressed on every development project exceeding 10,000 S.F. in area of disturbance. These standards are considered a minimum and may require additional measures as deemed necessary by the local approving authority or the consulting engineer.

No.	CRITERIA, TECHNIQUE OR METHOD	PRACTICES PROVIDED
1	Permanent or temporary soil stabilization shall be applied to denuded areas within seven (7) days after final grade has been reached on any portion of the site. Temporary soil stabilization shall be applied within seven (7) days to denuded areas that may be at final grade but will remain dormant (undisturbed) for longer than fourteen (14) days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one (1) year.	(TS) (PS) (MU) FOR ALL DENUDED AREAS
2	During construction of the project, soil stockpiles shall be stabilized or protected with sediment trapping measures. The contractor is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as soil intentionally transported from the project site.	(TS) (PS) (MU) FOR PROVIDED STOCKPILE
3	A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that, in the opinion of the Town, is uniform, mature enough to survive and will inhibit erosion.	(TS) (PS) (MU) FOR ALL DENUDED AREAS
4	Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land–disturbing activity and shall be made functional before upslope land disturbance takes place.	(ST) FOR ALL DRAINAGE DIVIDES
5	Stabilization methods shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.	(TS) (PS) (MU) FOR ALL EARTHEN STRUCTURES
6	Sediment traps and basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.	SEE SUPPLEMENTAL CALCULATIONS
7	Cut and fill slopes shall be constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one (1) year of permanent stabilization shall be provided with additional slope stabilization measures until the problem is corrected.	(TS) (PS) (MU) FOR ALL ERODING SLOPES
8	Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.	(SCC)
9	Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.	SHOULD SEEPS OCCUR IN ANY EXISTING OR NEW CUT OR FILL SLOPE, THE CONTRACTOR SHALL FIRST INSURE THAT THERE ARE NOT AREAS OF PONDED WATER AT THE TOPS OF THE SLOPES, AND THEN SHALL DIRECT WATER TO THE OCEAN EXISTING DRAINAGE SYSTEMS. CONSULT WITH THE ENGINEER FOR ON-SITE EVALUATION OF THE AREAS OF SEEPAGE.
10	All storm sewer inlets that are made operable during construction shall be protected so that sediment–laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.	(IP) (CIP) FOR ALL STORM WATER INTAKES
11	Before newly constructed stormwater conveyance channels are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.	(RR) (OP) FOR ALL STORMWATER OUTLETS
12	When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.	(SF) FOR THE PROTECTION OF THE NATURAL WATERCOURSE
13	When a live watercourse must be crossed by construction vehicles more than twice in any six (6) month period, a temporary stream crossing constructed of nonerodible material.	PERMANENT CROSSING
14	All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met. The beds and banks of any watercourse shall be stabilized immediately after work in the watercourse is completed.	(TS) (PS) (MU)
15	The beds and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.	(TS) (PS) (MU)
16	Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: 1) No more than 500 linear feet of any trench may be opened at one time. 2) Excavated material shall be placed on the uphill side of trenches. 3) Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off–site property. 4) Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization. 5) Restabilization shall be accomplished in accordance with these regulations. 6) Applicable safety regulations shall be complied with.	NOT APPLICABLE
17	Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner.	(CE) FOR ALL POINTS OF INGRESS/EGRESS
18	All temporary erosion and sediment control measures shall be removed within thirty (30) days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP Authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.	(TS) (PS) (MU)
19	Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24–hour duration in accordance with the following criteria:	SELF–EXPLANATORY

PRELIMINARY - NOT FOR CONSTRUCTION

						SNP	JRM
						SNP	JRM
						NO.	BY
6/4/2015	LEVEL 3 DESIGN DOCUMENTS					SNP	SMS
	LEVEL 2 DESIGN DOCUMENTS					CK	APP
DATE	REVISIONS AND RECORD OF ISSUE						

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

SAVED:
PLOTTED:
USER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Phone: (540) 552-0048 www.chacompanies.com

BEDFORD REGIONAL AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

EROSION AND SEDIMENT CONTROL NOTES, NARRATIVE & LEGEND

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

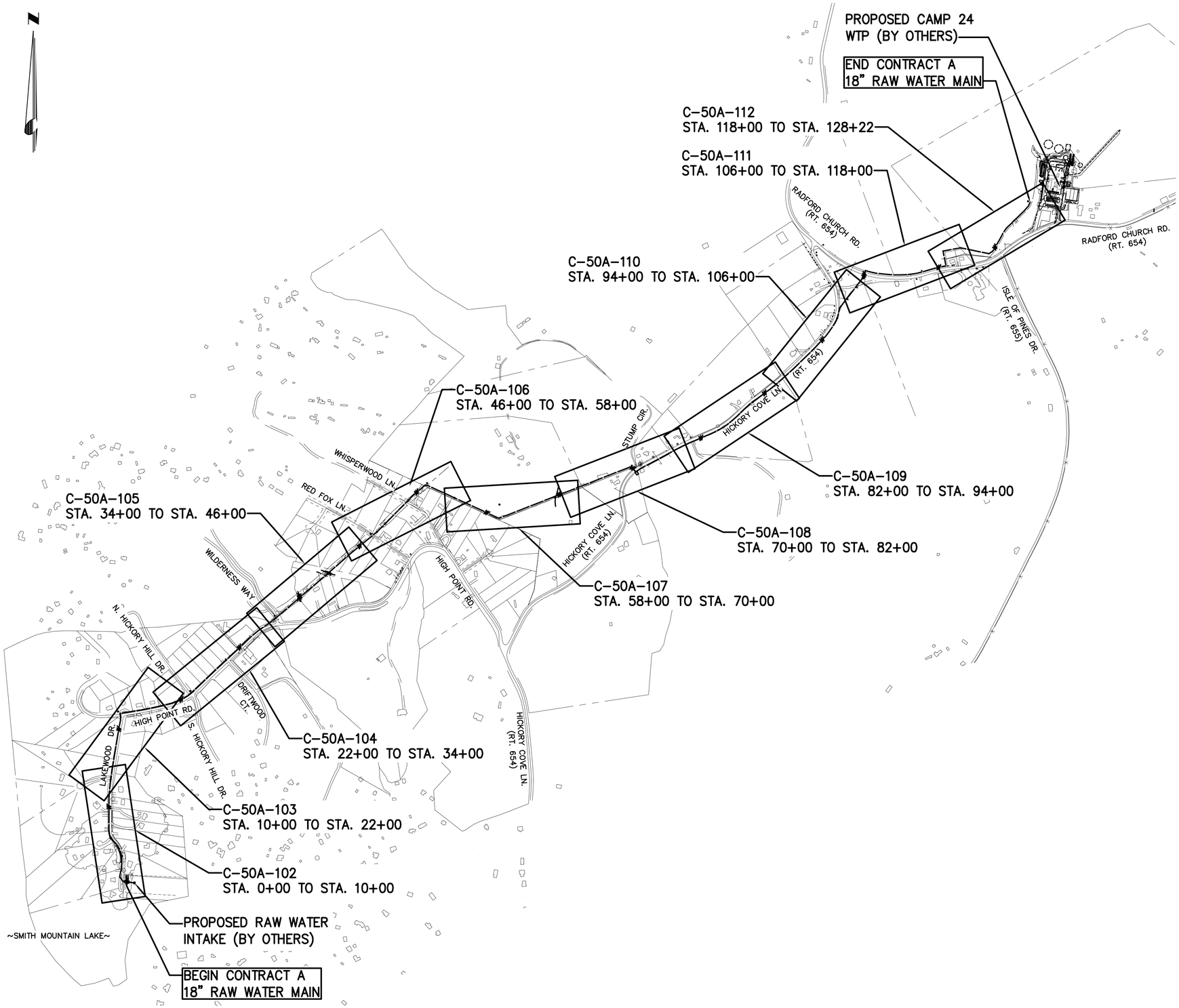
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-00-505
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-00-505_27872.DWG
Saved: 6/4/2015 6:17:10 AM Plotted: 6/4/2015 6:25:53 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



INDEX OF DRAWINGS

SHEET NUMBER	SHEET TITLE
C-50A-101	CONTRACT A – RAW WATER MAIN KEY PLAN
C-50A-102	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE LAKEWOOD DR STA. 0+00 TO STA. 10+00
C-50A-103	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE LAKEWOOD DR/ HIGH POINT RD STA. 10+00 TO STA. 22+00
C-50A-104	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE HIGH POINT RD STA. 22+00 TO STA. 34+00
C-50A-105	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE STA. 34+00 TO STA. 46+00
C-50A-106	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE STA. 46+00 TO STA. 58+00
C-50A-107	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE STA. 58+00 TO STA. 70+00
C-50A-108	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE HICKORY COVE LN (RT 654) STA. 70+00 TO STA. 82+00
C-50A-109	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE HICKORY COVE LN (RT 654) STA. 82+00 TO STA. 94+00
C-50A-110	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE HICKORY COVE LN (RT 654) STA. 94+00 TO STA. 106+00
C-50A-111	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE RADFORD CHURCH RD (RT 654) STA. 106+00 TO STA. 118+00
C-50A-112	CONTRACT A RAW WATER MAIN – PLAN AND PROFILE STA. 118+00 TO STA. 128+22

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 • www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE
DATE
6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A - RAW WATER MAIN KEY PLAN

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

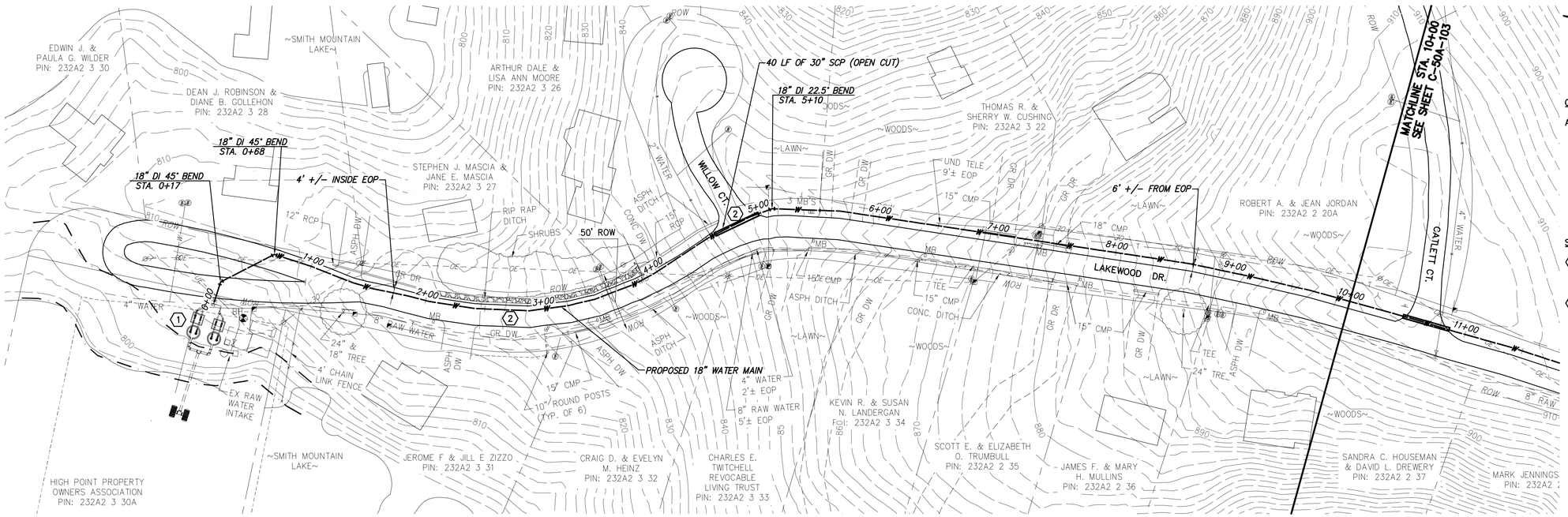
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50A-101
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-101_27872.DWG
Saved: 6/4/2015 8:59:52 AM Plotted: 6/4/2015 9:01:43 AM User: Ng, Kevin LastSavedBy: 5415

FD7000
DT000



0 50 100
Scale in feet

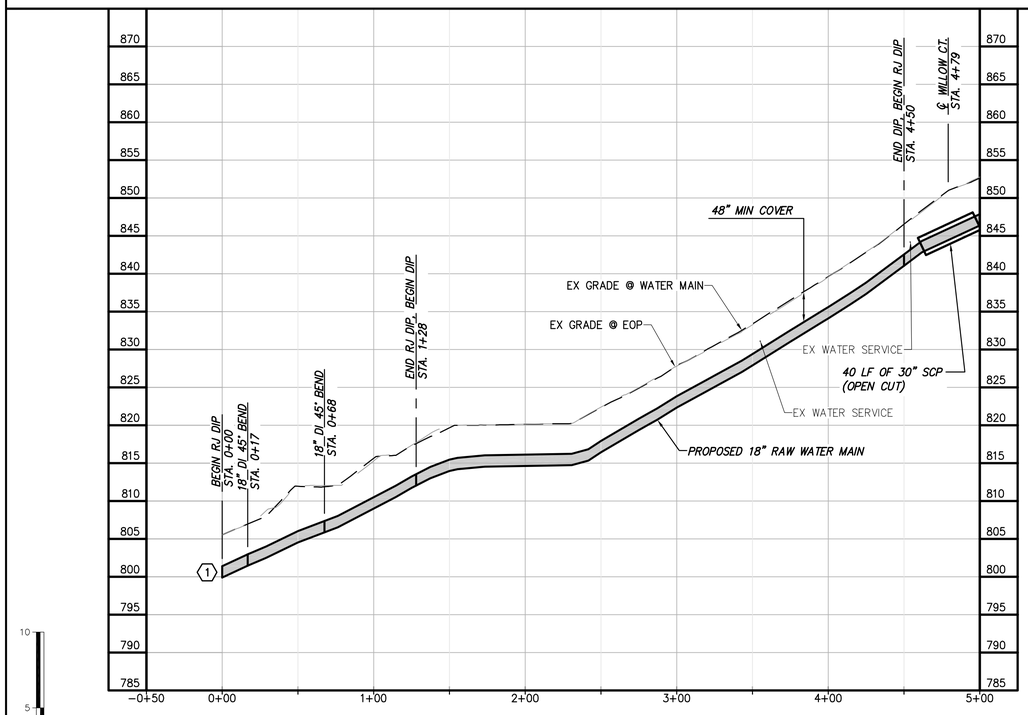
GENERAL NOTES:

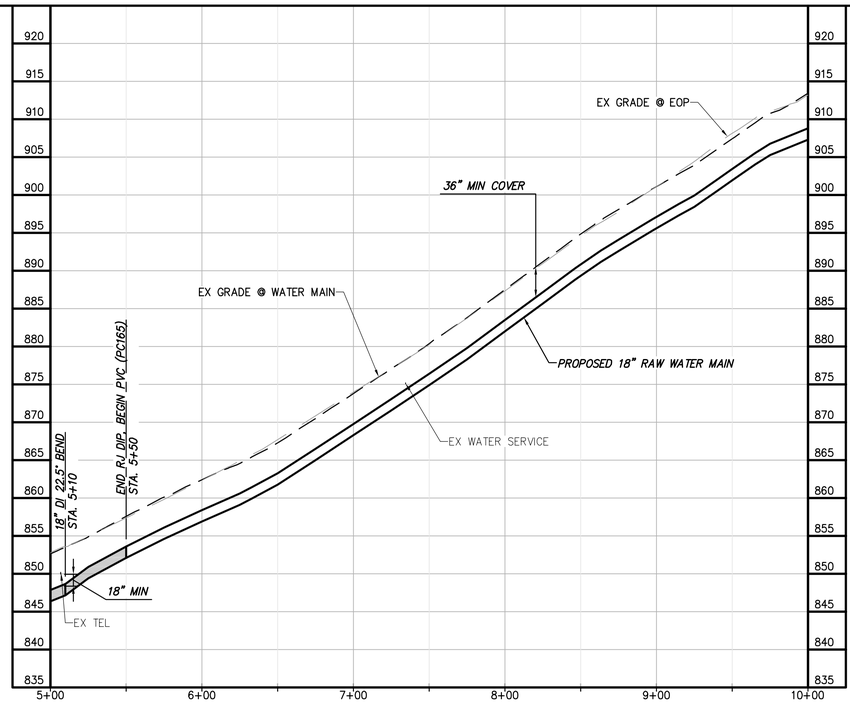
A.

SPECIFIC NOTES

1. COORDINATE TIE IN TO RAW WATER PUMP STATION DISCHARGE PIPING W/ CONTRACTOR FOR SAME.
2. ONE LANE TO REMAIN OPEN AT ALL TIMES

RAW WATER MAIN PLAN





0 5 10
0 50 100
Scale in feet

RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

6/4/2015 LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
DATE REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

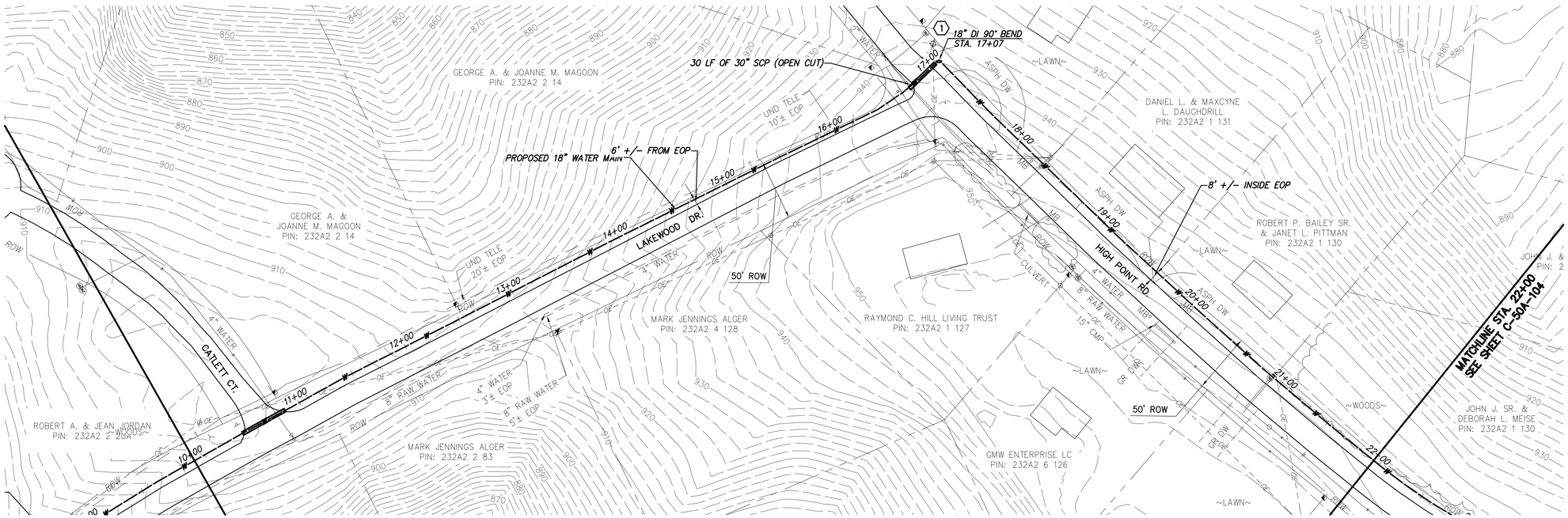
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

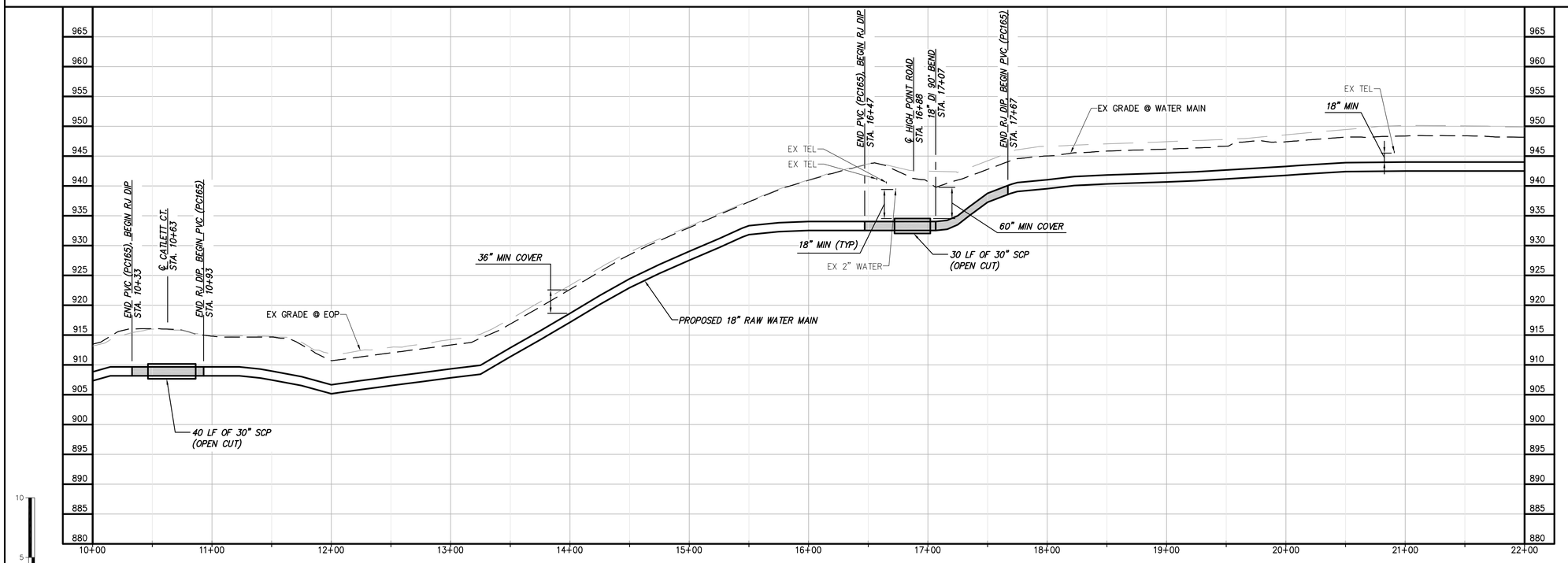
PROJECT NO.
27872

C-50A-102
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50A-102-106_27872.DWG
Saved: 6/1/2015 1:08:48 PM Plotted: 6/4/2015 10:53:56 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1. ONE LANE TO REMAIN OPEN AT ALL TIMES.

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

DATE	
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:
USER:
PLOTTED:
SAVED:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

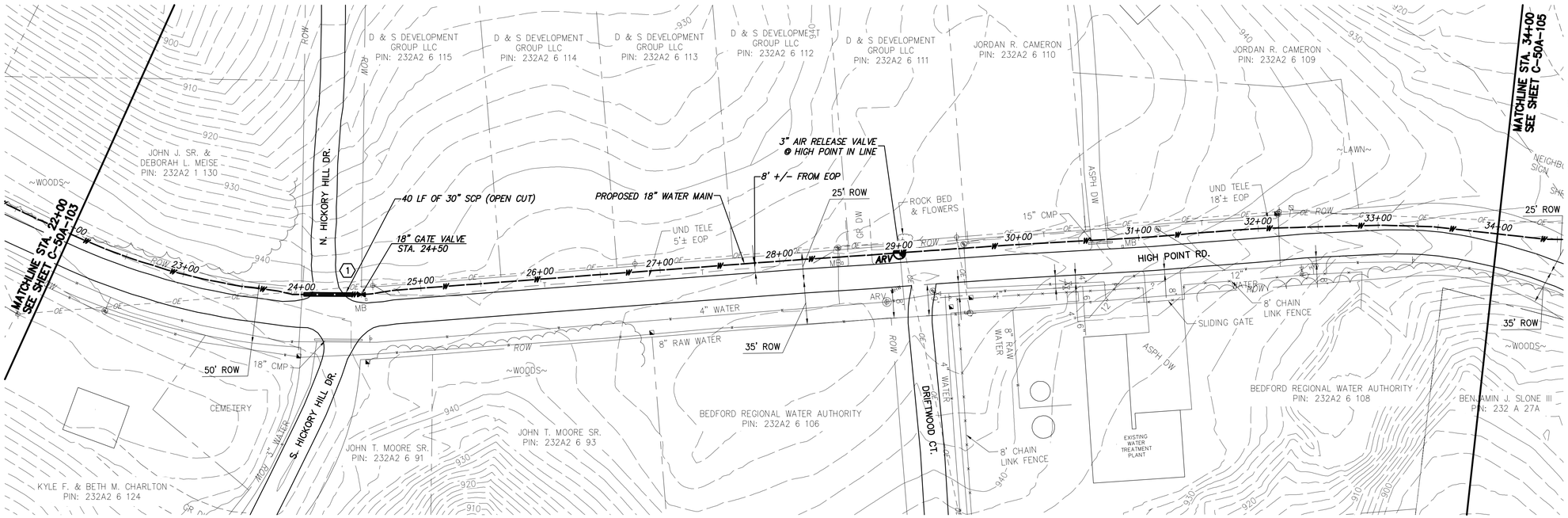
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

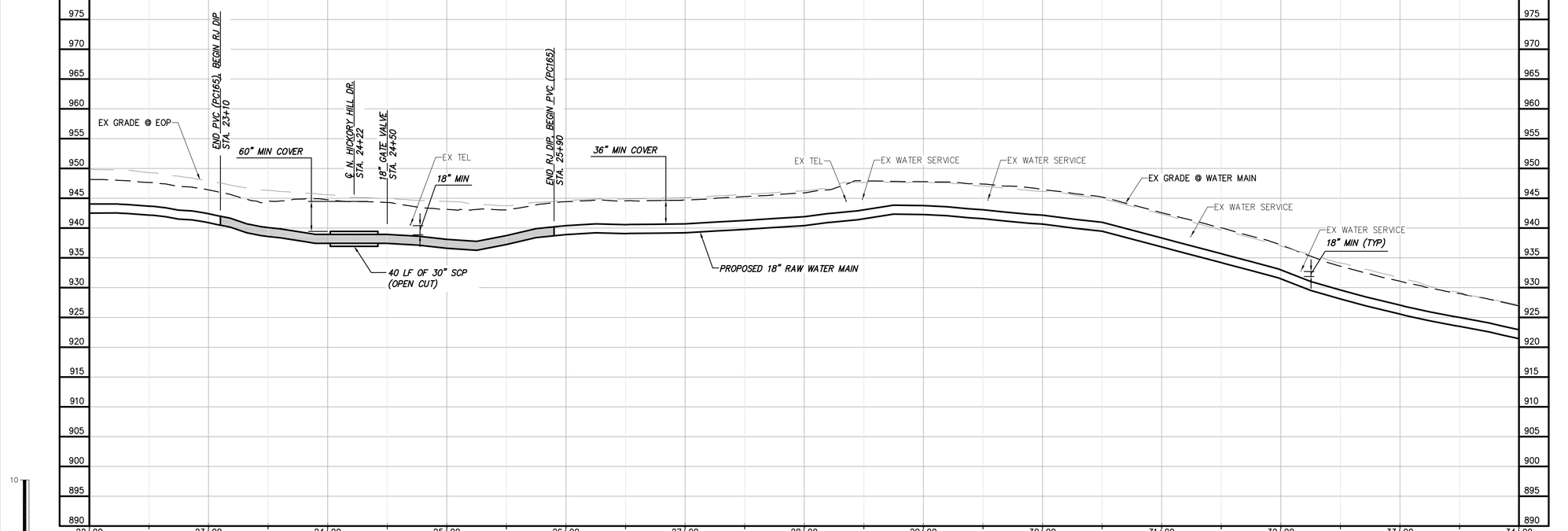
PROJECT NO.
27872

C-50A-103
SHEET
OF

File: V:\PROJECTS\VAN\VK3\27872\CADD_ACAD\C-50A-102-106_27872.DWG
Saved: 6/1/2015 1:08:48 PM Plotted: 6/4/2015 9:03:23 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ONE LANE TO REMAIN OPEN AT ALL TIMES.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

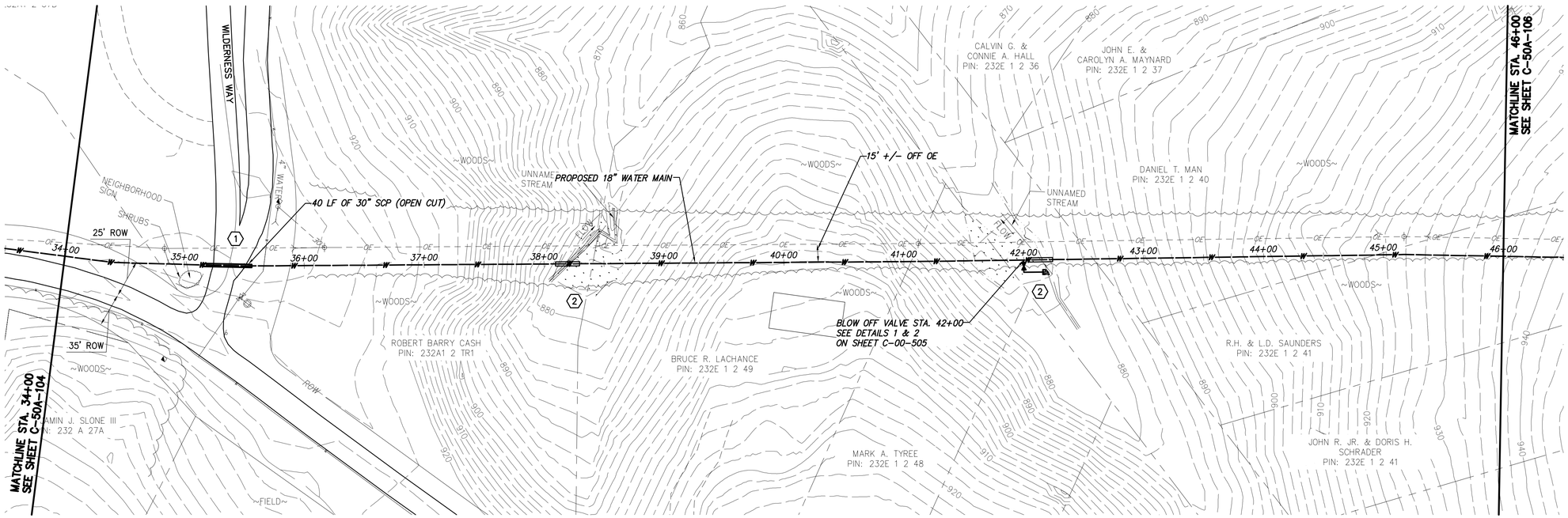
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

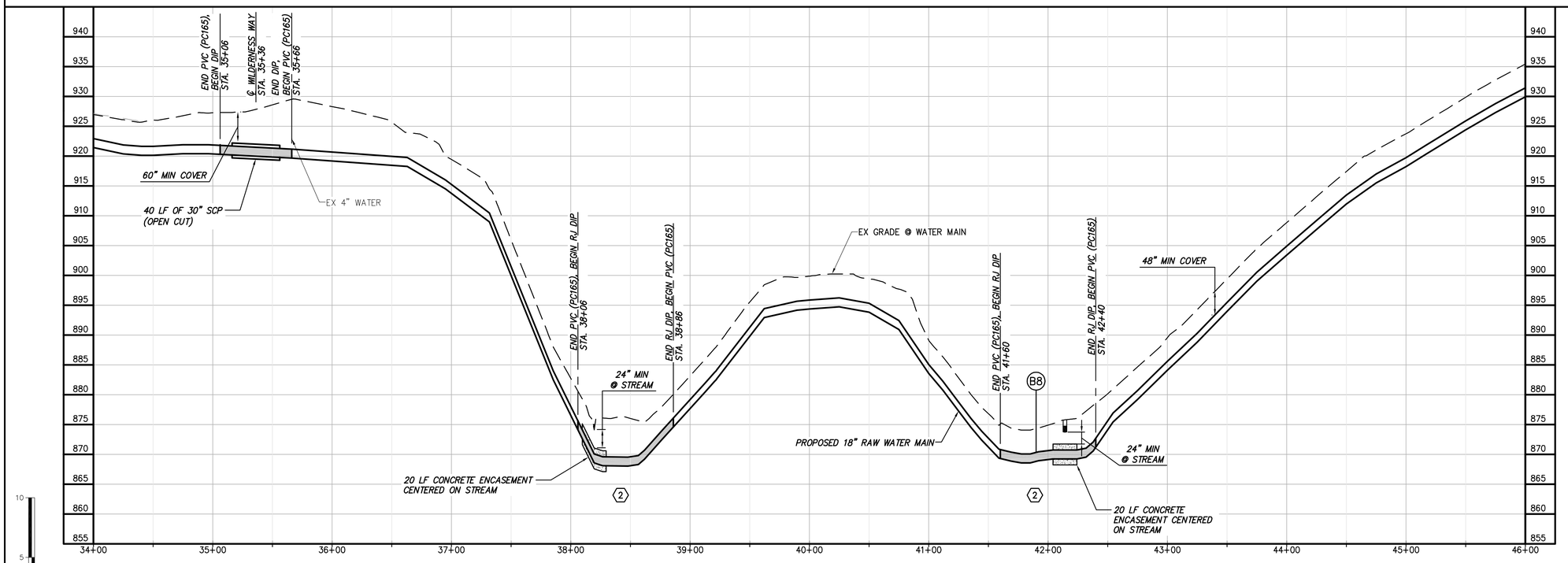
PROJECT NO.
27872

C-50A-104
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-102-106_27872.DWG
Saved: 6/1/2015 1:08:48 PM Plotted: 6/4/2015 9:03:50 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1. ONE LANE TO REMAIN OPEN AT ALL TIMES.
2. STRUCTURAL COVER/SHEATHING TO BE PLACED ADJACENT TO TRENCH WITHIN MARSH AREA AS A CONSTRUCTION VEHICLE PATH. PRESERVE, STOCKPILE & REPLACE TOP 12" OF TOPSOIL EXCAVATED FOR INSTALLATION OF WATER MAIN.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

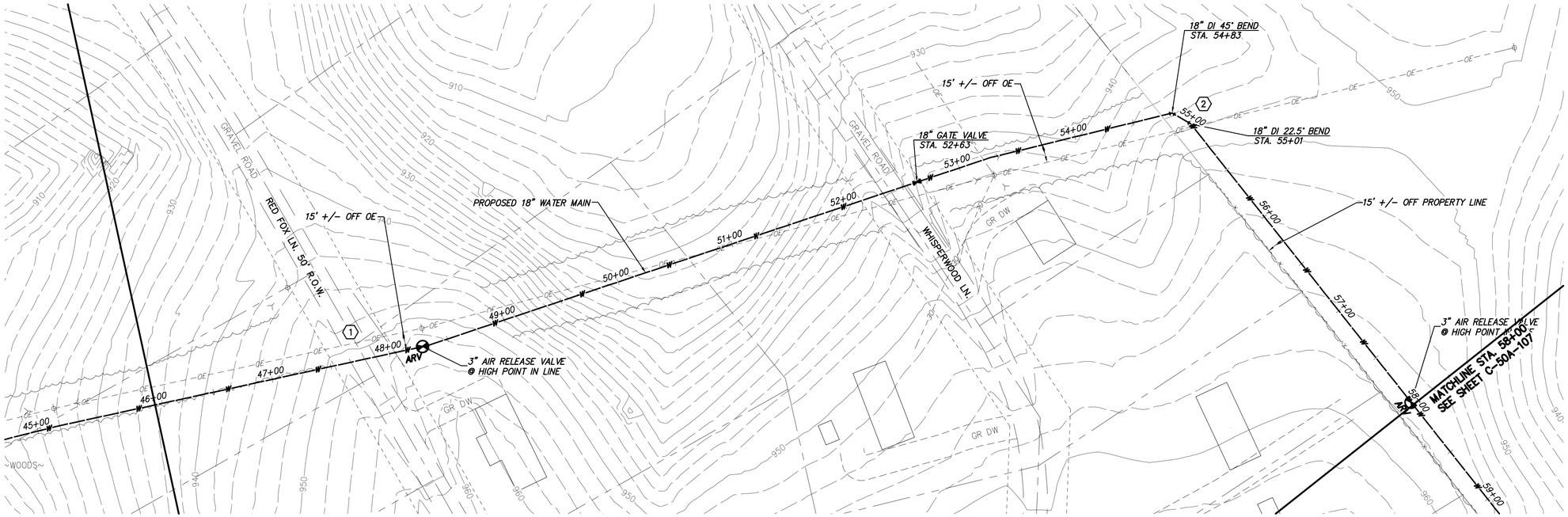
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

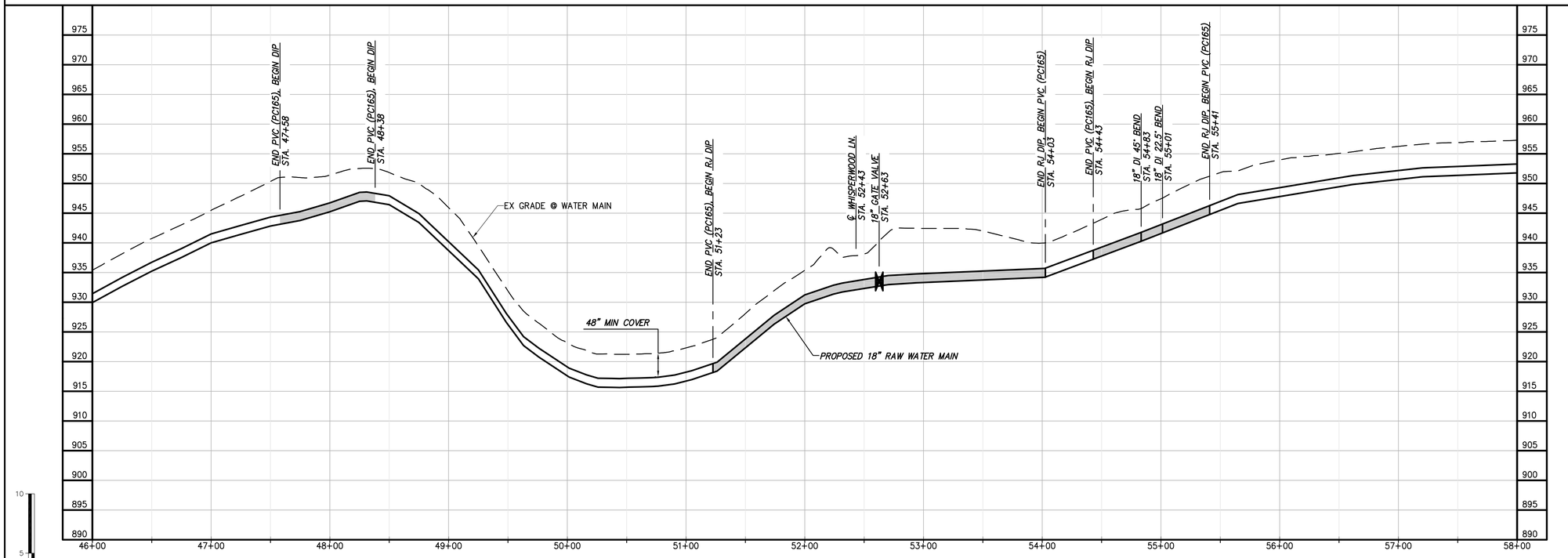
C-50A-105
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50A-102-106_27872.DWG
Saved: 6/1/2015 1:08:48 PM Plotted: 6/4/2015 9:04:18 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COMPACTED SUBBASE WITH MIN 8" NO. 21A OR NO. 22 STONE.

REMOVE AND REPLACE EXISTING FENCING WITH SIMILAR MATERIALS. MAINTAIN SECURITY OF PROPERTY AT ALL TIMES. INSTALL 12' FARM GATE AT ALL FENCE CROSSINGS. SEE DETAIL 7 ON SHEET C-00-505.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
6/4/2015
DATE
REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

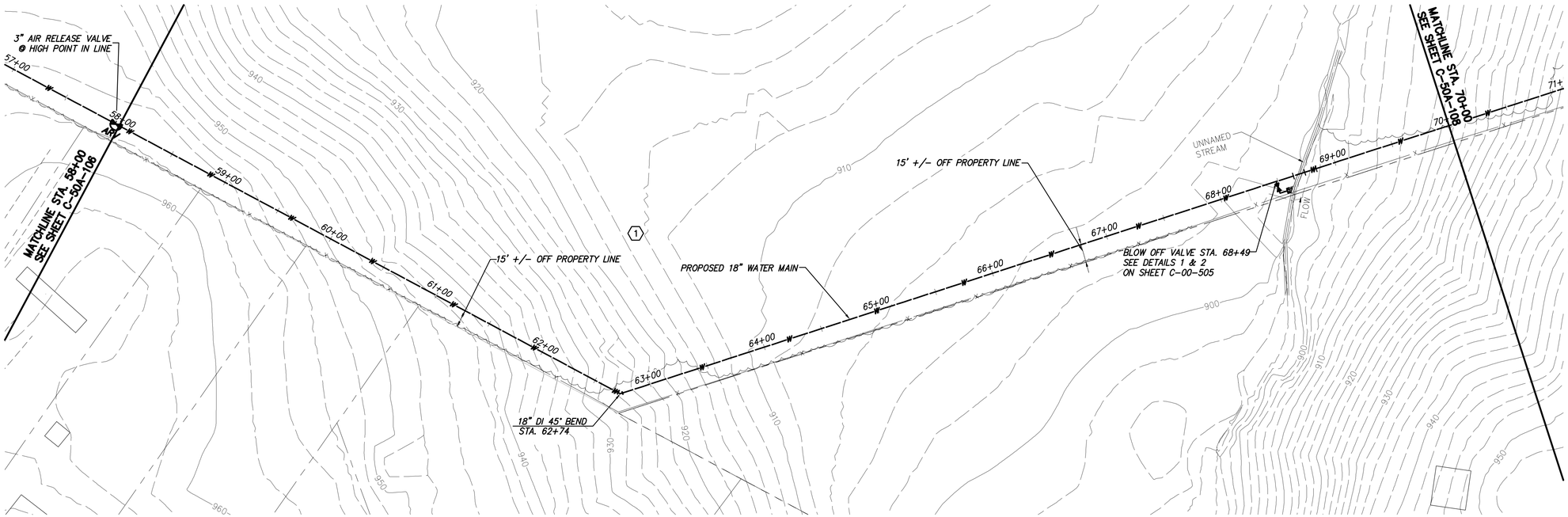
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

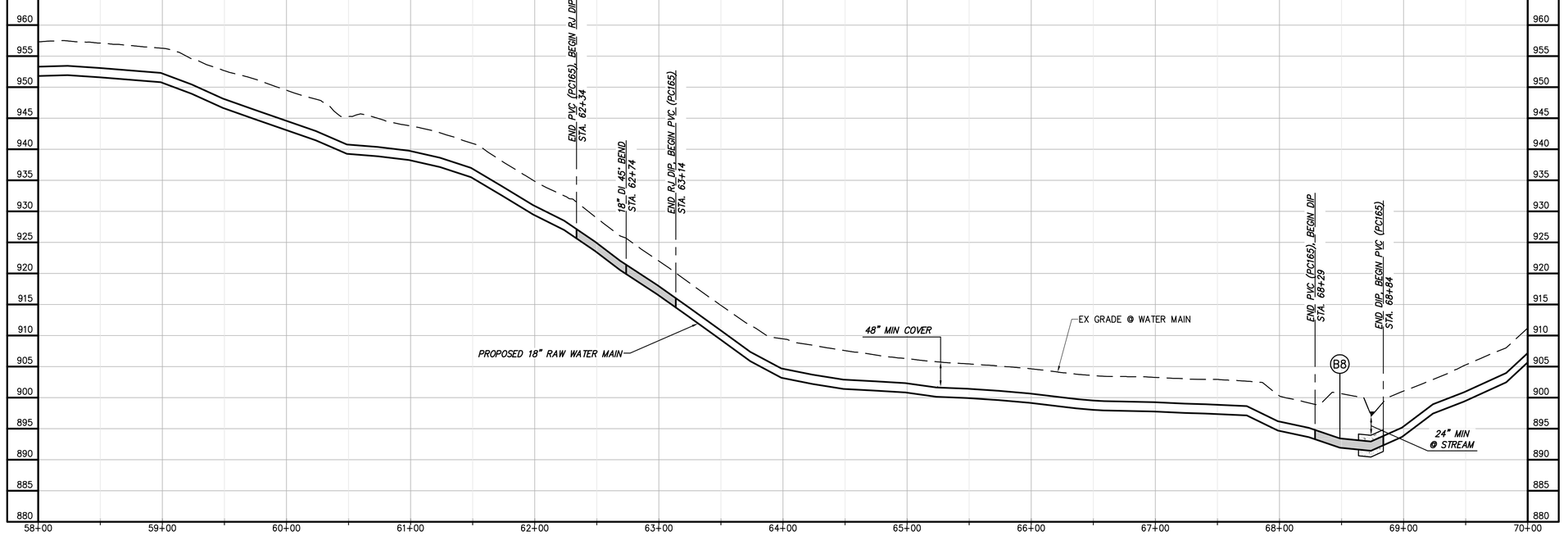
PROJECT NO.
27872

C-50A-106
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-102-106_27872.DWG
Saved: 6/1/2015 1:08:48 PM Plotted: 6/4/2015 9:04:43 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) REMOVE AND REPLACE EXISTING FENCING WITH SIMILAR MATERIALS. MAINTAIN SECURITY OF PROPERTY AT ALL TIMES. INSTALL 12' FARM GATE AT ALL FENCE CROSSINGS. SEE DETAIL 7 ON SHEET C-00-505

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

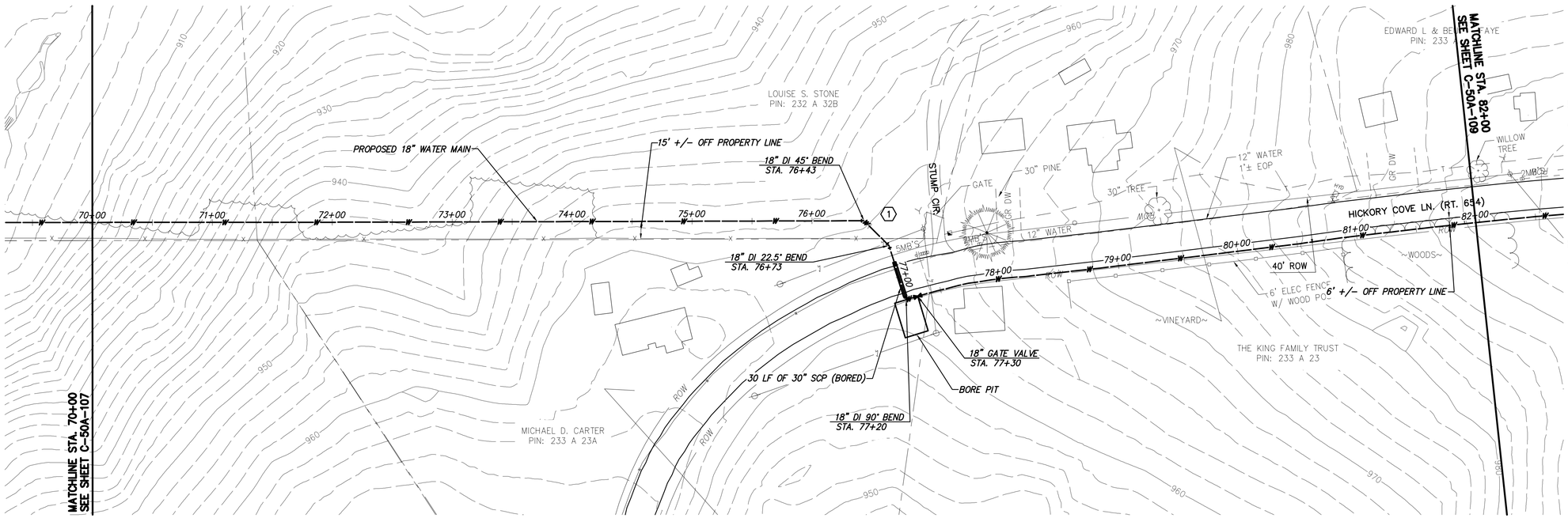
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

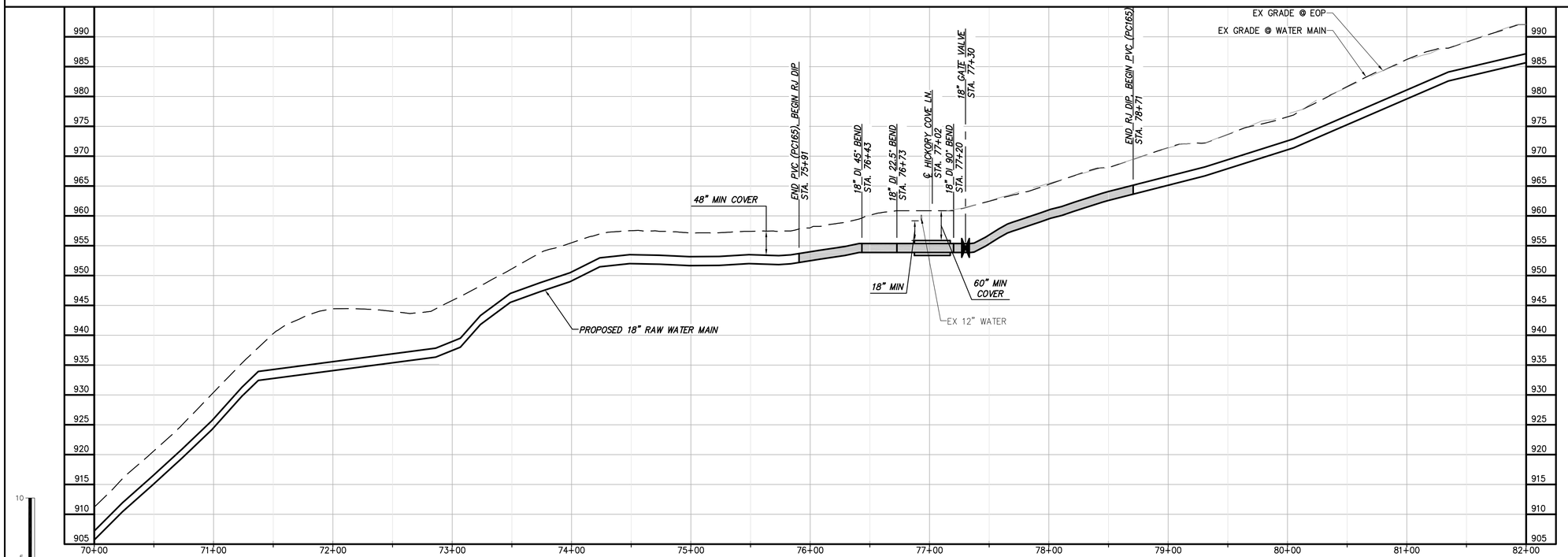
PROJECT NO.
27872

C-50A-107
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-107-111_27872.DWG
Saved: 6/4/2015 7:13:36 AM Plotted: 6/4/2015 9:05:51 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) REMOVE AND REPLACE EXISTING FENCING WITH SIMILAR MATERIALS. MAINTAIN SECURITY OF PROPERTY AT ALL TIMES. INSTALL 12' FARM GATE AT ALL FENCE CROSSINGS. SEE DETAIL 7 ON SHEET C-00-505

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

DATE	
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

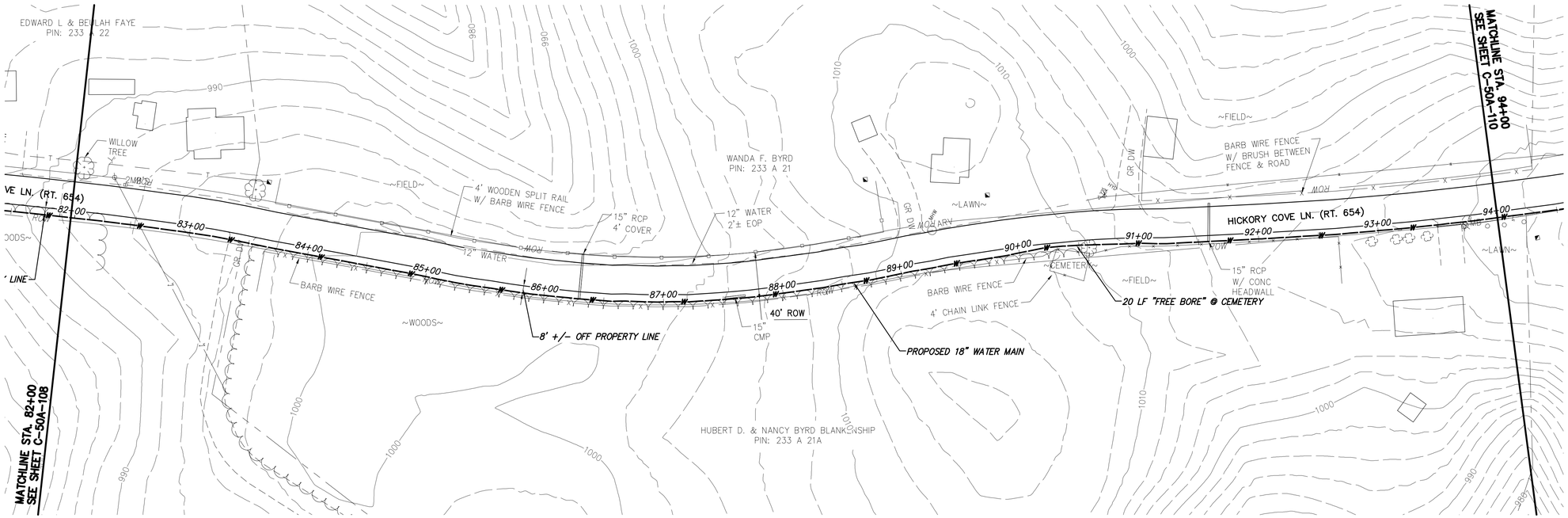
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50A-108
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50A-107-111_27872.DWG
Saved: 6/4/2015 7:13:36 AM Plotted: 6/4/2015 10:56:42 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



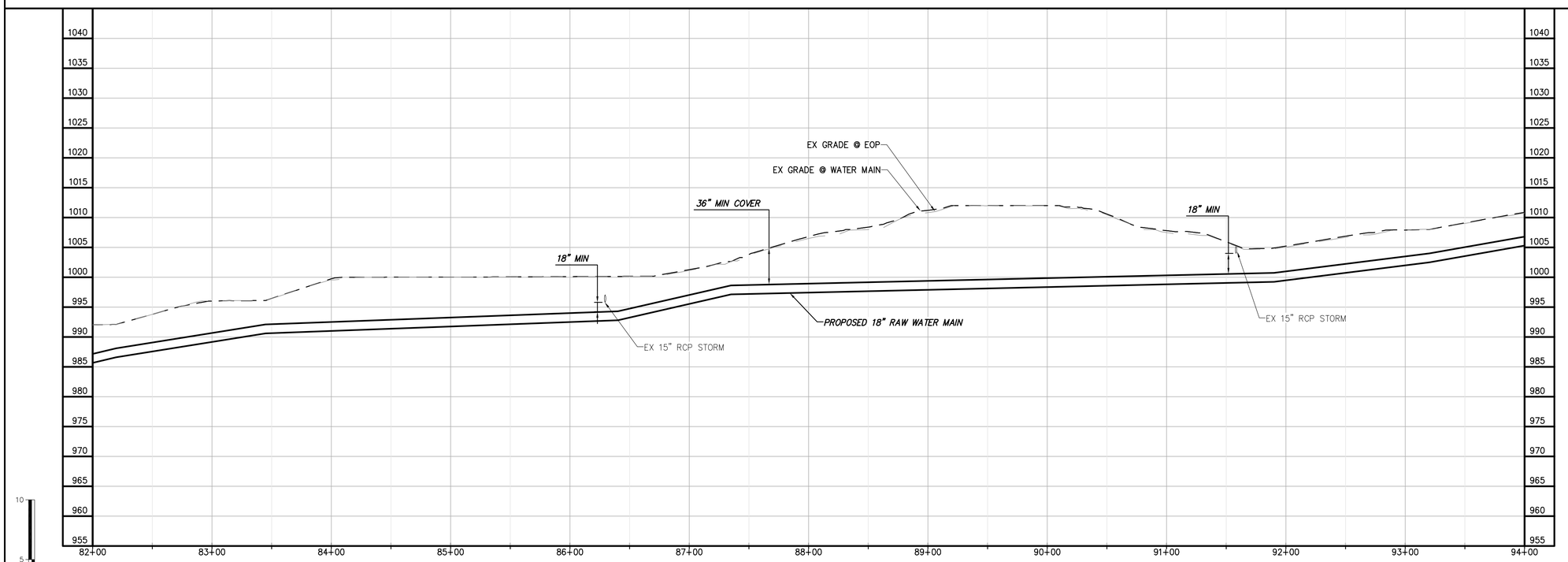
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
DATE
6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

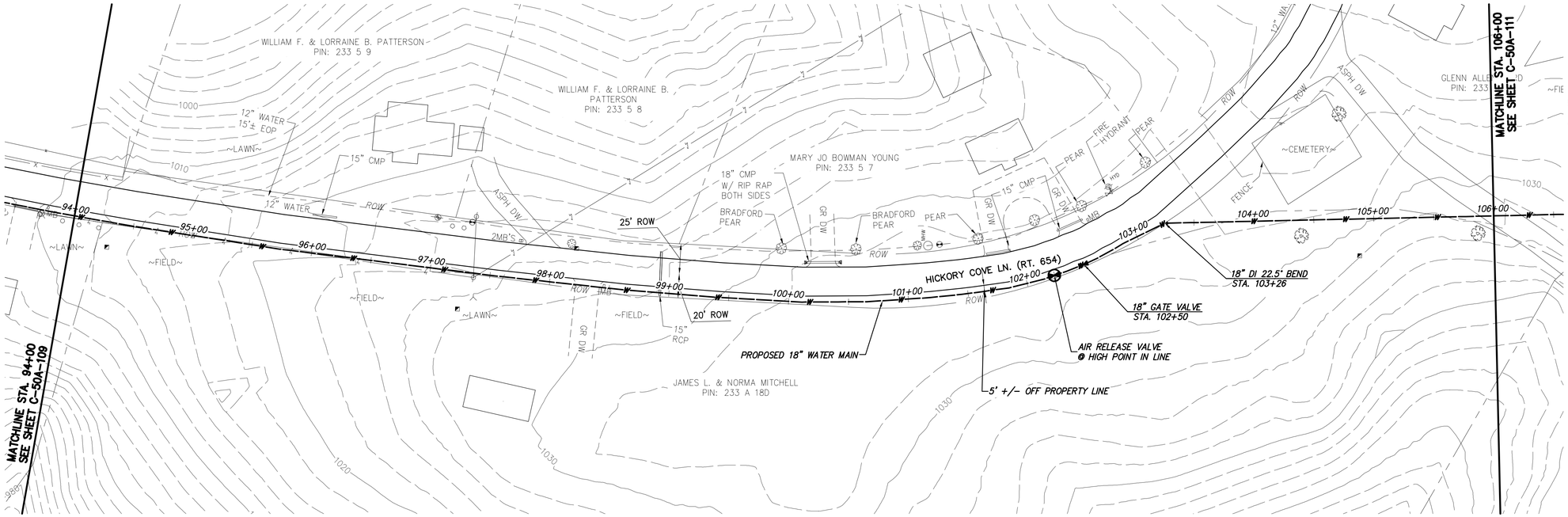
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

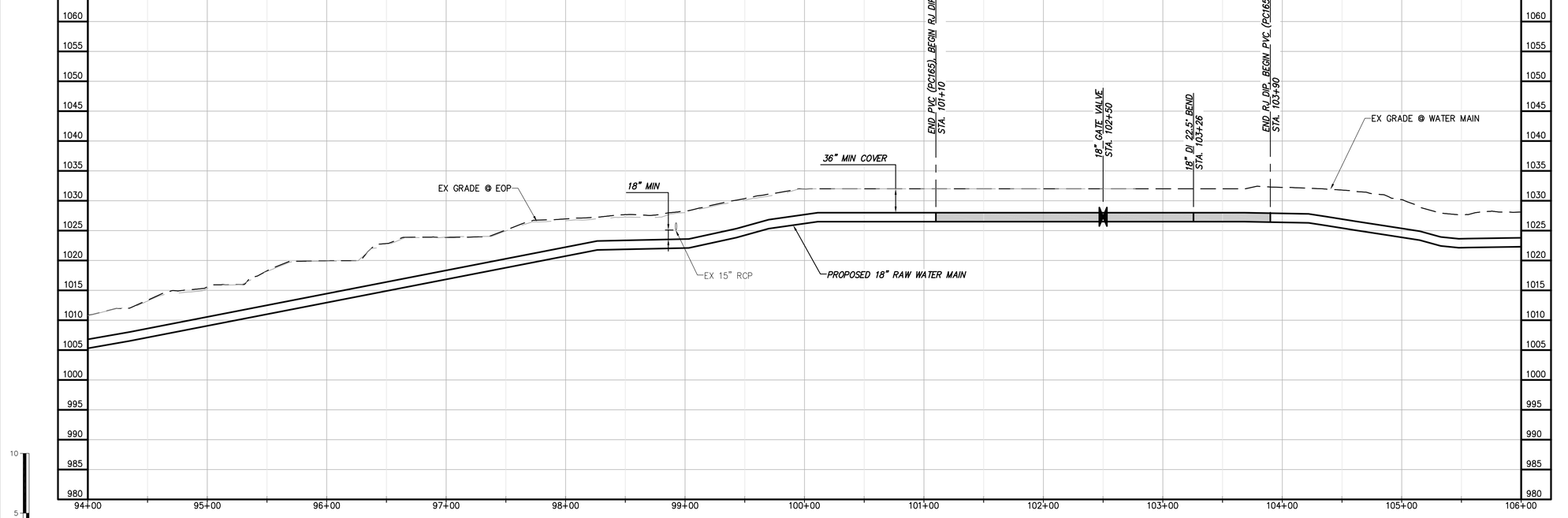
PROJECT NO.
27872

C-50A-109
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-107-111_27872.DWG
Saved: 6/4/2015 7:13:36 AM Plotted: 6/4/2015 9:06:37 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

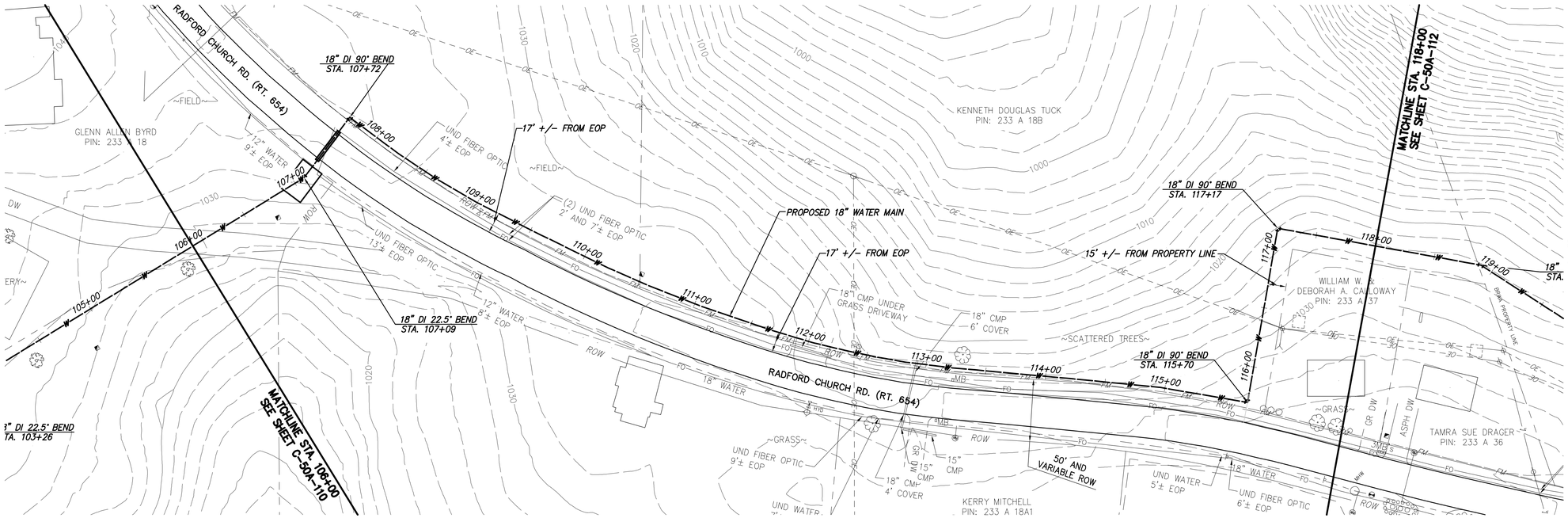
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

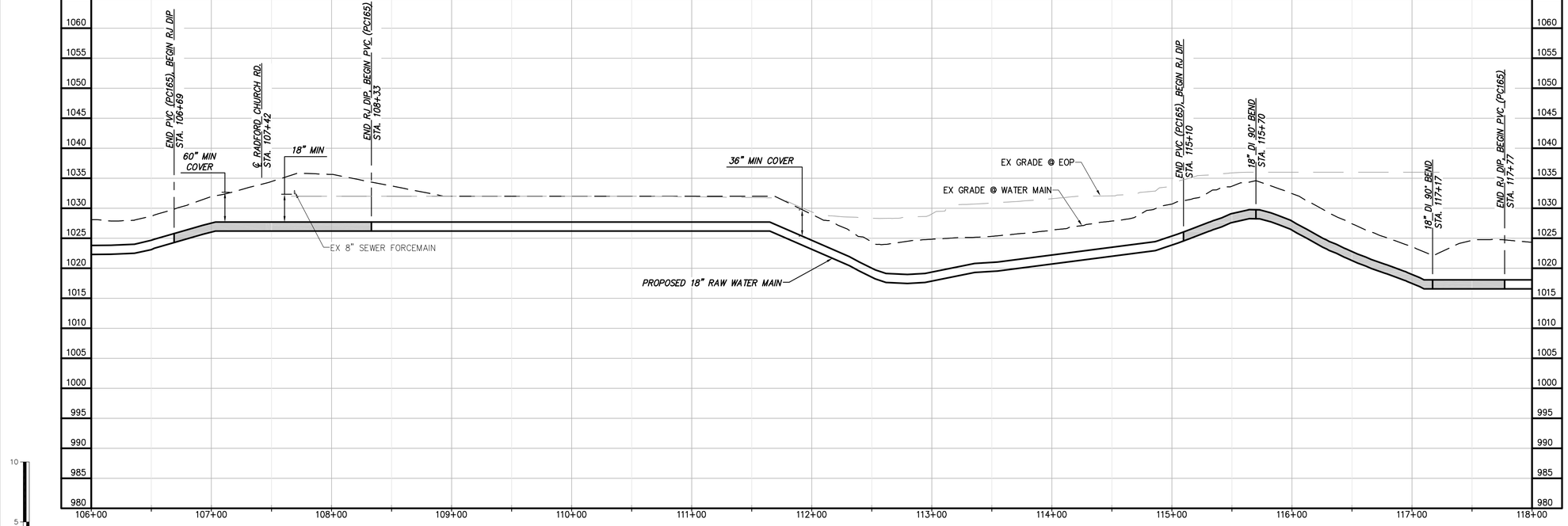
PROJECT NO.
27872

C-50A-110
SHEET
OF

File: V:\PROJECTS\ANYK3\27872\CADD_ACAD\C-50A-107-111_27872.DWG
Saved: 6/4/2015 7:13:36 AM Plotted: 6/4/2015 9:06:58 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

① ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

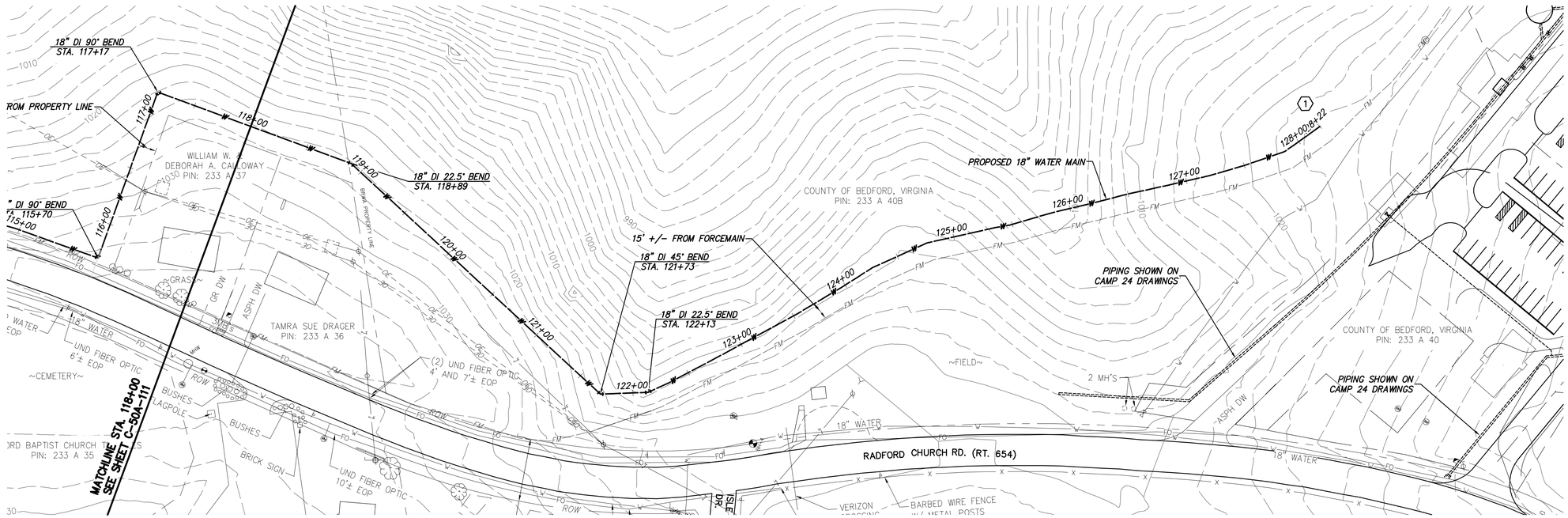
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

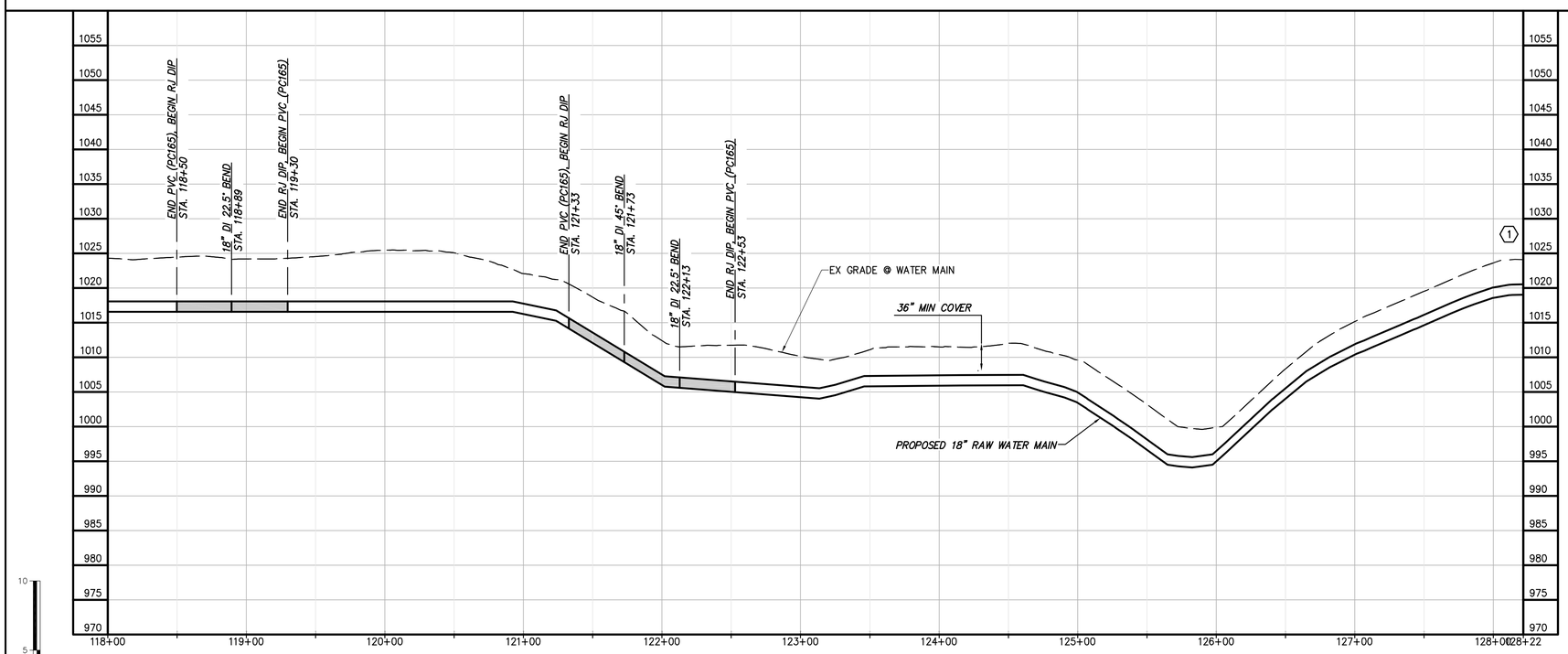
PROJECT NO.
27872

C-50A-111
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-107-111_27872.DWG
Saved: 6/4/2015 7:13:36 AM Plotted: 6/4/2015 9:07:21 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



RAW WATER MAIN PLAN



RAW WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COORDINATE TIE IN TO WTP INFLUENT LINE W/ CONTRACTOR FOR SAME.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	SNP	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	SNP	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT A RAW WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

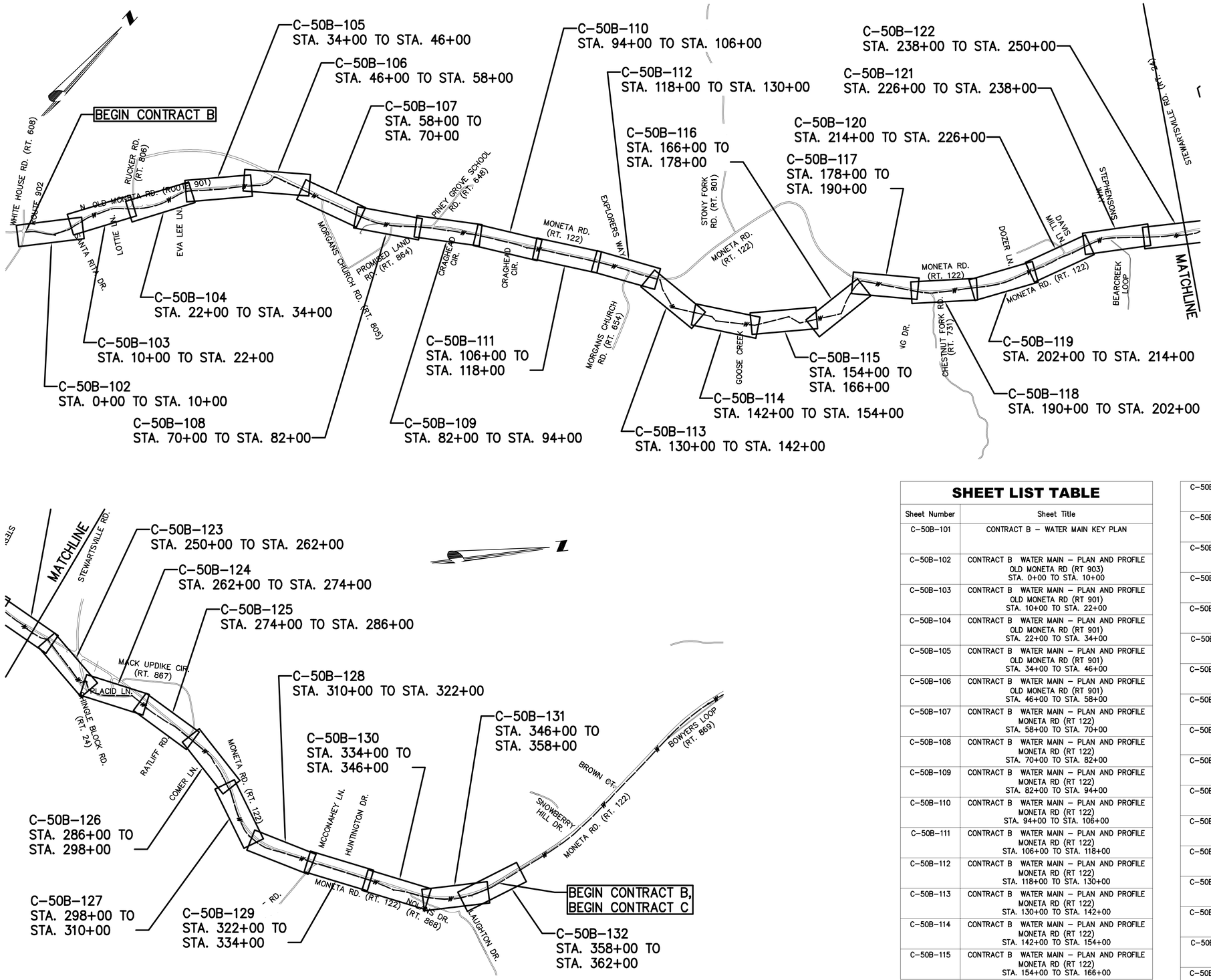
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50A-112
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50A-112_27872.DWG
Saved: 6/4/2015 7:13:45 AM Plotted: 6/4/2015 9:08:30 AM User: Nq, Kevin LastSavedBy: 4465
FD7000
D7000



SHEET LIST TABLE

Sheet Number	Sheet Title
C–50B–101	CONTRACT B – WATER MAIN KEY PLAN
C–50B–102	CONTRACT B WATER MAIN – PLAN AND PROFILE OLD MONETA RD (RT 903) STA. 0+00 TO STA. 10+00
C–50B–103	CONTRACT B WATER MAIN – PLAN AND PROFILE OLD MONETA RD (RT 901) STA. 10+00 TO STA. 22+00
C–50B–104	CONTRACT B WATER MAIN – PLAN AND PROFILE OLD MONETA RD (RT 901) STA. 22+00 TO STA. 34+00
C–50B–105	CONTRACT B WATER MAIN – PLAN AND PROFILE OLD MONETA RD (RT 901) STA. 34+00 TO STA. 46+00
C–50B–106	CONTRACT B WATER MAIN – PLAN AND PROFILE OLD MONETA RD (RT 901) STA. 46+00 TO STA. 58+00
C–50B–107	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 58+00 TO STA. 70+00
C–50B–108	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 70+00 TO STA. 82+00
C–50B–109	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 82+00 TO STA. 94+00
C–50B–110	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 94+00 TO STA. 106+00
C–50B–111	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 106+00 TO STA. 118+00
C–50B–112	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 118+00 TO STA. 130+00
C–50B–113	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 130+00 TO STA. 142+00
C–50B–114	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 142+00 TO STA. 154+00
C–50B–115	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 154+00 TO STA. 166+00
C–50B–116	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 166+00 TO STA. 178+00
C–50B–117	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 178+00 TO STA. 190+00
C–50B–118	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 190+00 TO STA. 202+00
C–50B–119	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 202+00 TO STA. 214+00
C–50B–120	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 214+00 TO STA. 226+00
C–50B–121	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 226+00 TO STA. 238+00
C–50B–122	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 238+00 TO STA. 250+00
C–50B–123	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 250+00 TO STA. 262+00
C–50B–124	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 262+00 TO STA. 274+00
C–50B–125	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 274+00 TO STA. 286+00
C–50B–126	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 286+00 TO STA. 298+00
C–50B–127	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 298+00 TO STA. 310+00
C–50B–128	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 310+00 TO STA. 322+00
C–50B–129	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 322+00 TO STA. 334+00
C–50B–130	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 334+00 TO STA. 346+00
C–50B–131	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 346+00 TO STA. 358+00
C–50B–132	CONTRACT B WATER MAIN – PLAN AND PROFILE MONETA RD (RT 122) STA. 358+00 TO STA. 362+00

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5548 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B - WATER MAIN KEY PLAN

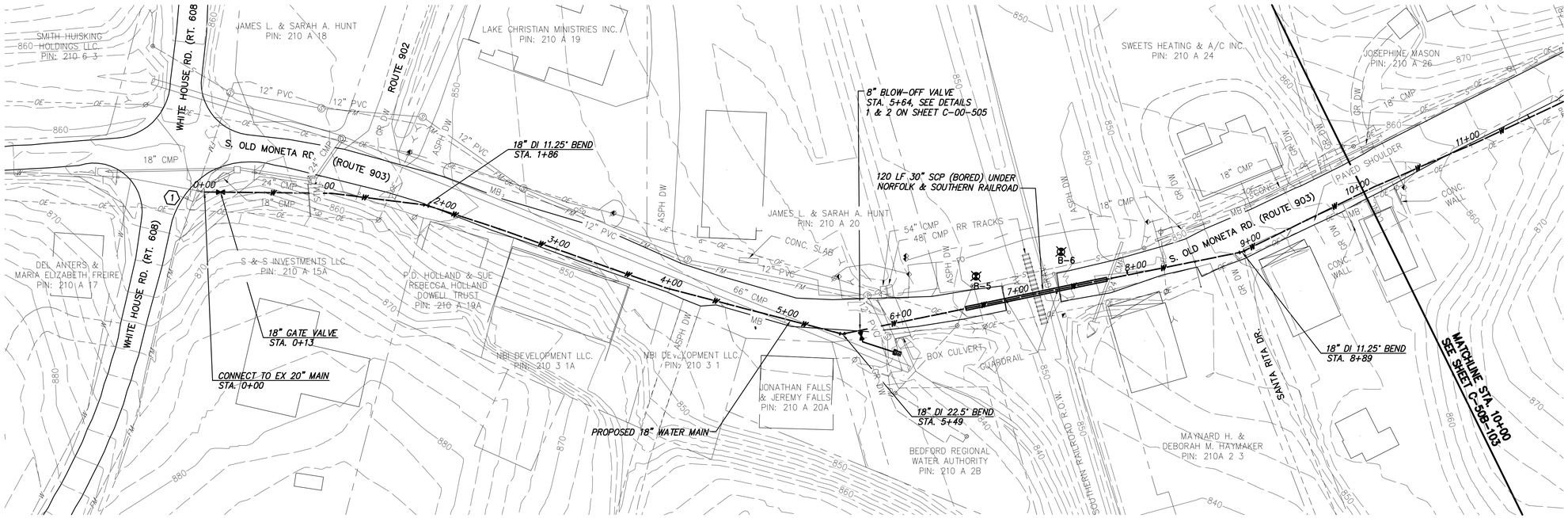
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 01-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

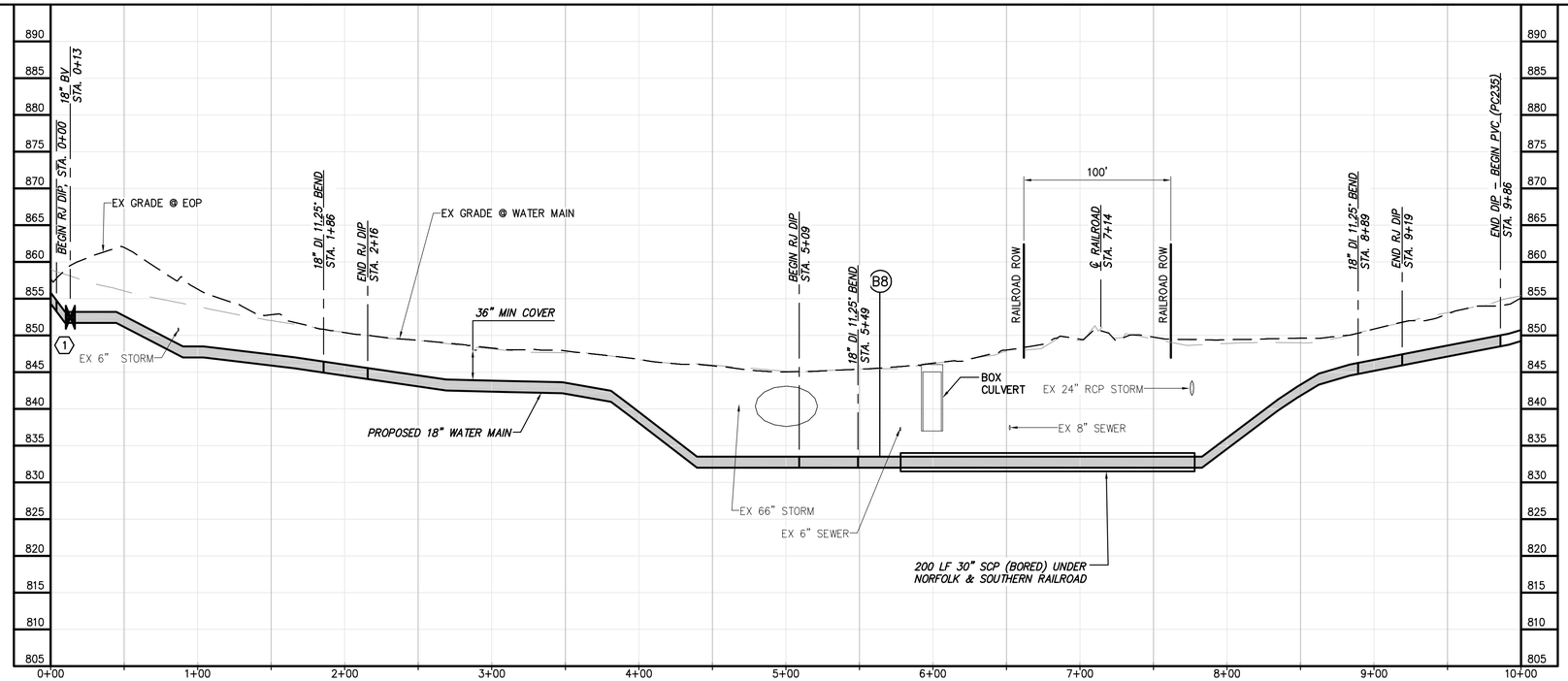
PROJECT NO.
27872

C-50B-101

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-101-27872.DWG
Saved: 6/4/2015 10:58:34 AM Plotted: 6/4/2015 11:32:43 AM User: Miller, Gary LastSavedBy: 4646
FD7000
DT000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COORDINATE TIE-IN WITH OWNER/ENGINEER.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

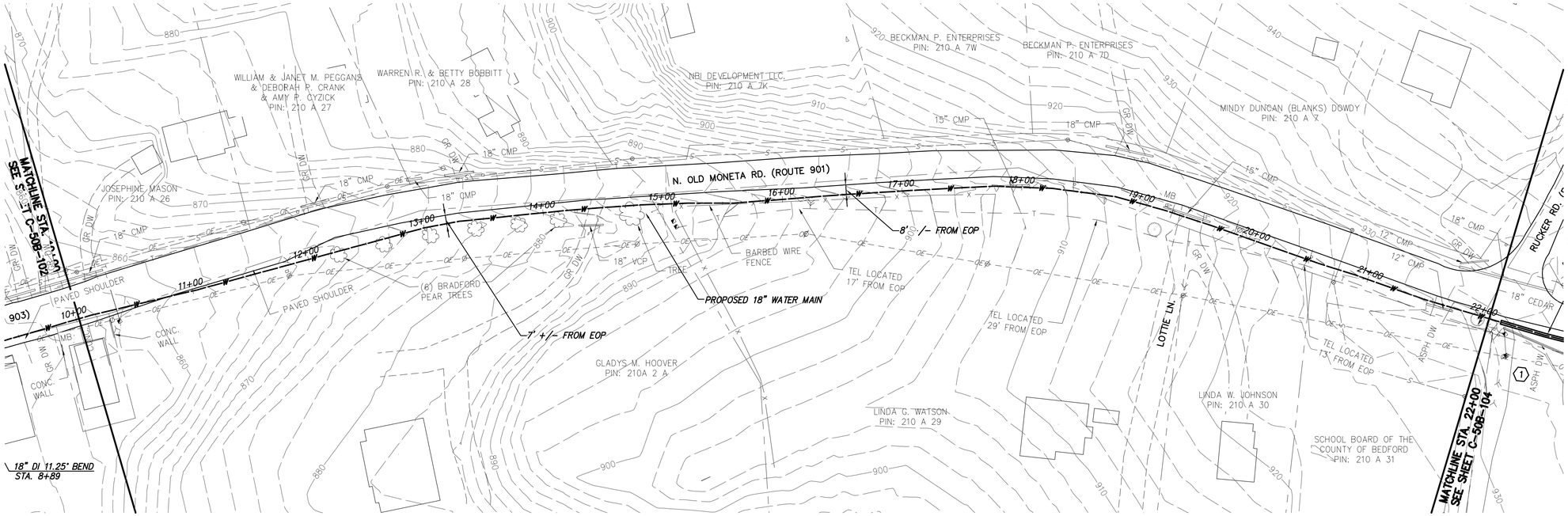
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50B-102

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-102-106_27872.DWG
Saved: 6/4/2015 11:25:45 AM Plotted: 6/4/2015 11:35:22 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



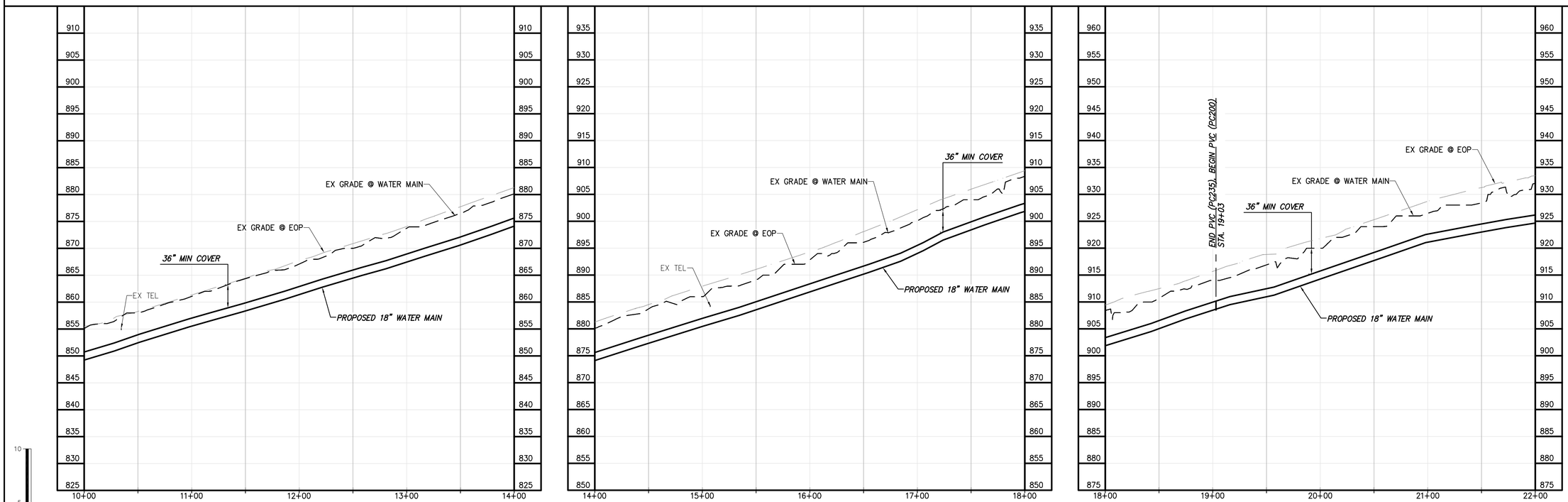
WATER MAIN PLAN

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

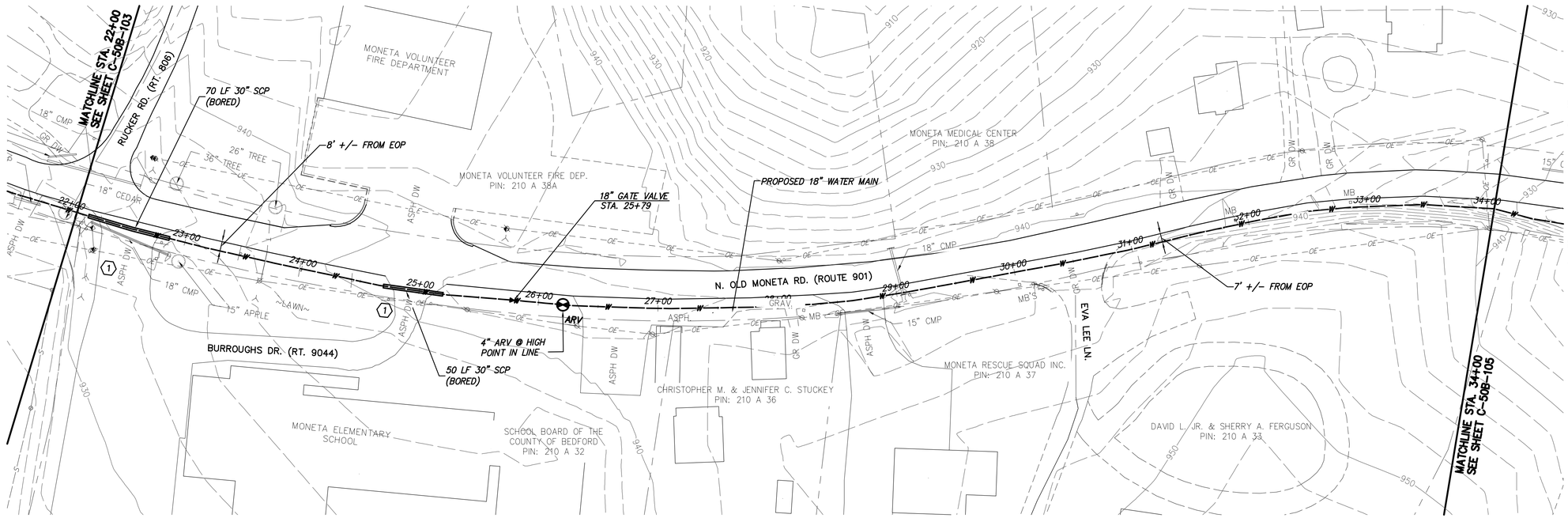
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

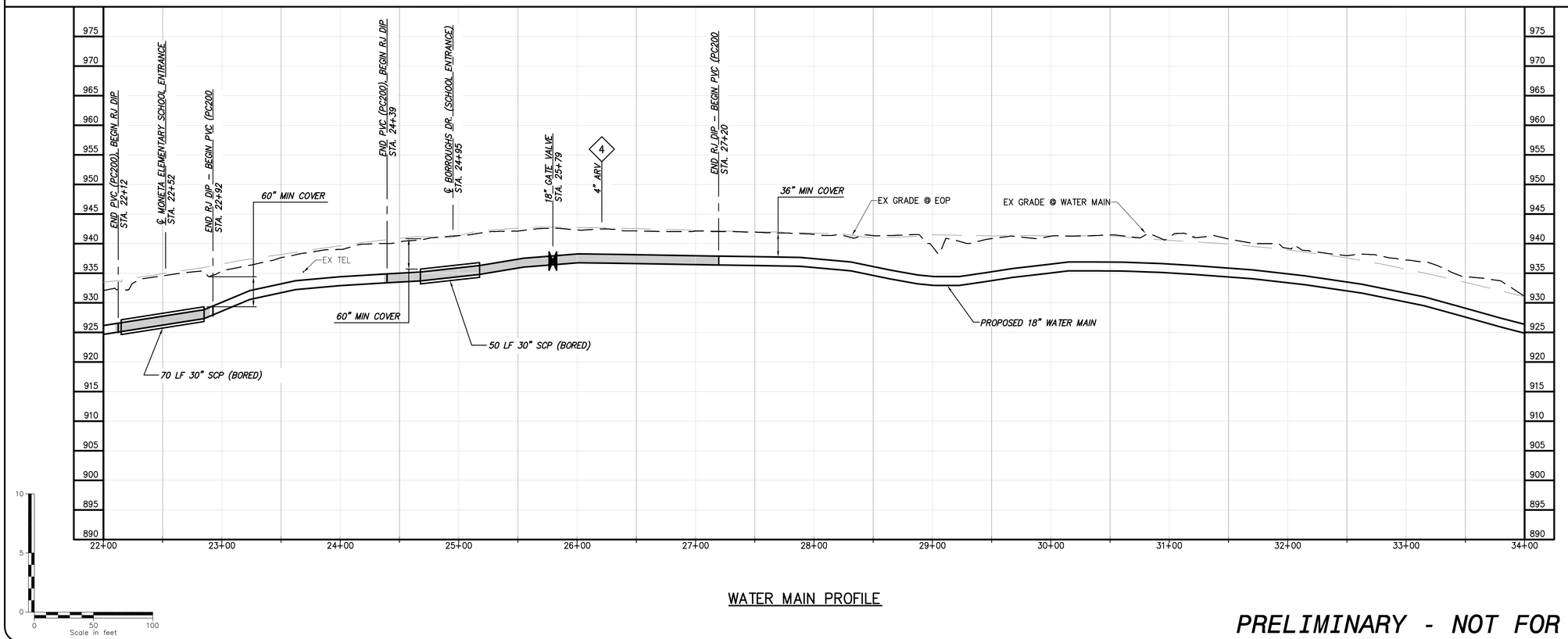
PROJECT NO.
27872

C-50B-103

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50B-102-106_27872.DWG
Saved: 6/4/2015 11:25:45 AM Plotted: 6/4/2015 11:36:29 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) MAINTAIN INGRESS AND EGRESS TO SCHOOL AT ALL TIMES.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.®
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

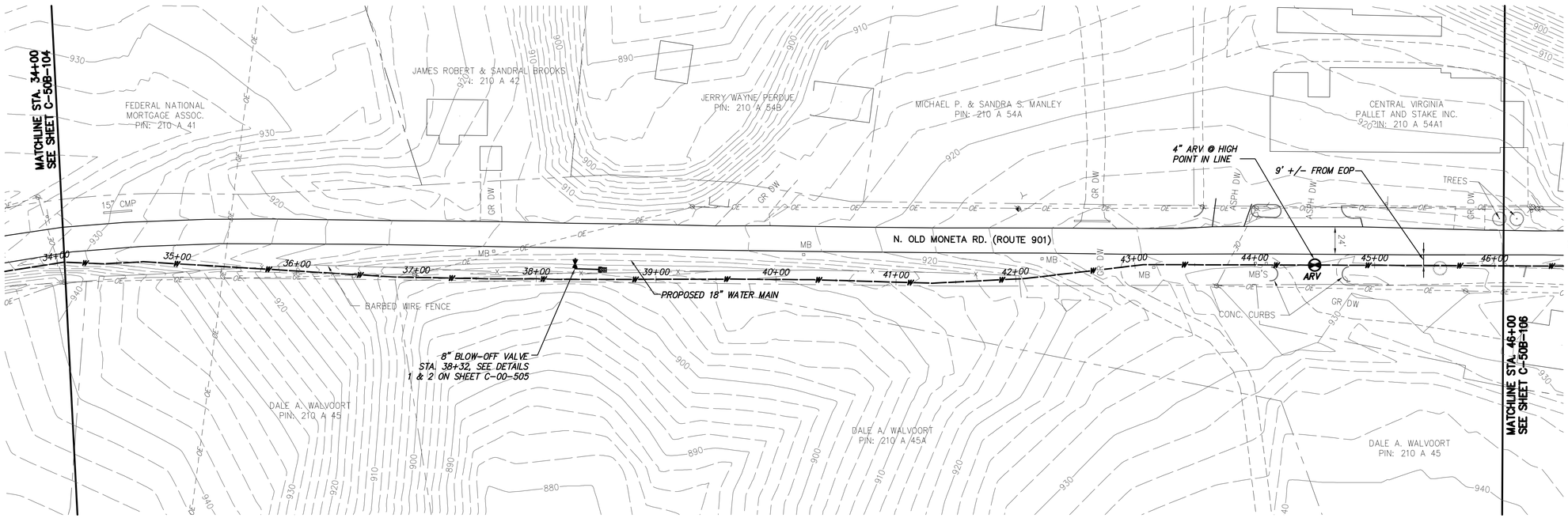
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

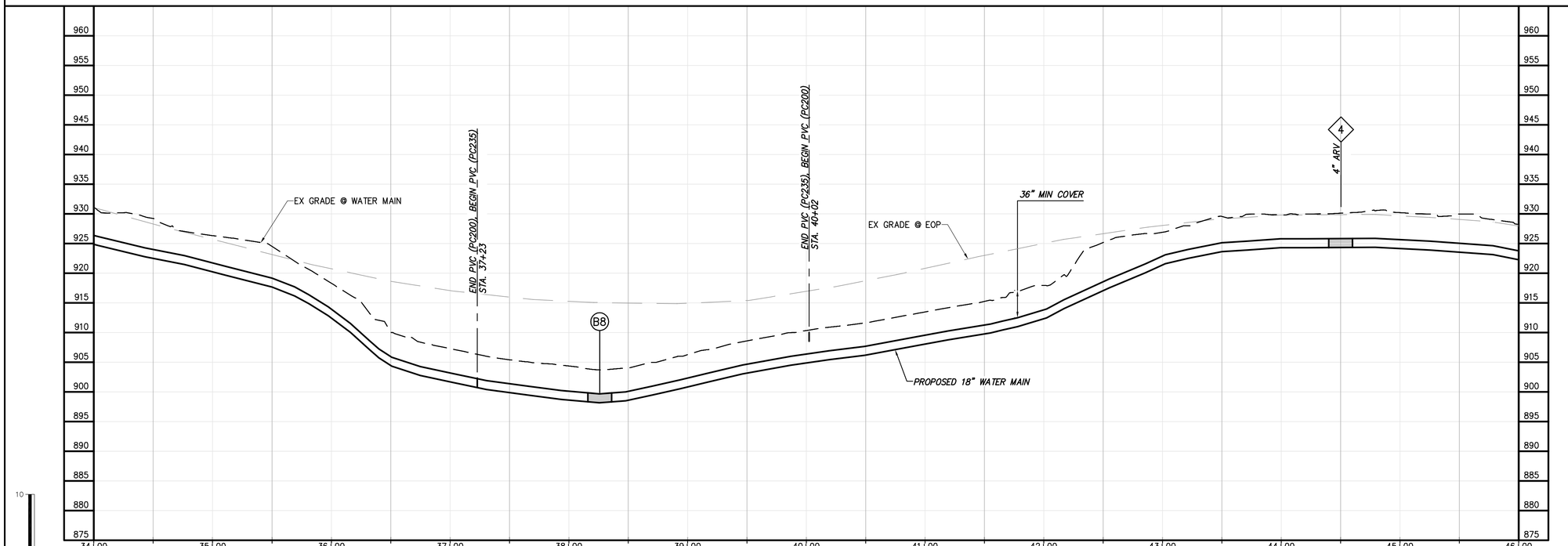
PROJECT NO.
27872

C-50B-104

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50B-102-106_27872.DWG
Saved: 6/4/2015 11:25:45 AM Plotted: 6/4/2015 11:37:11 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

DATE	
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

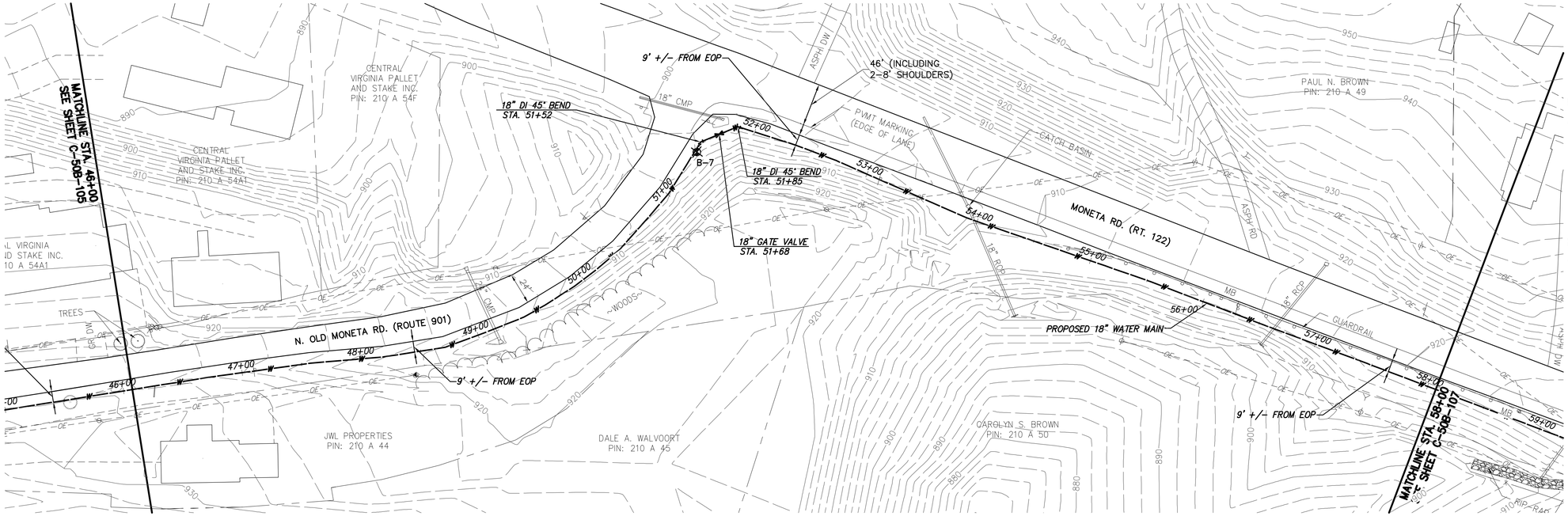
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

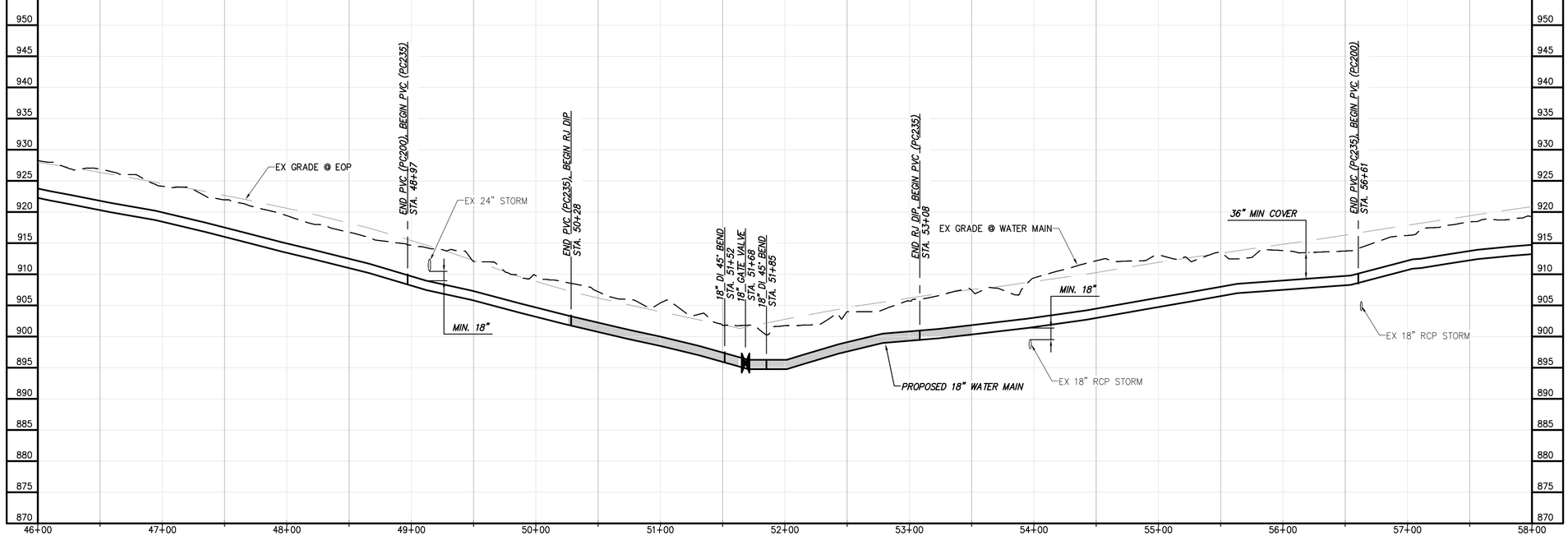
PROJECT NO.
27872

C-50B-105

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-102-106_27872.DWG
Saved: 6/4/2015 11:25:45 AM Plotted: 6/4/2015 11:37:53 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

0 50 100
Scale in feet

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

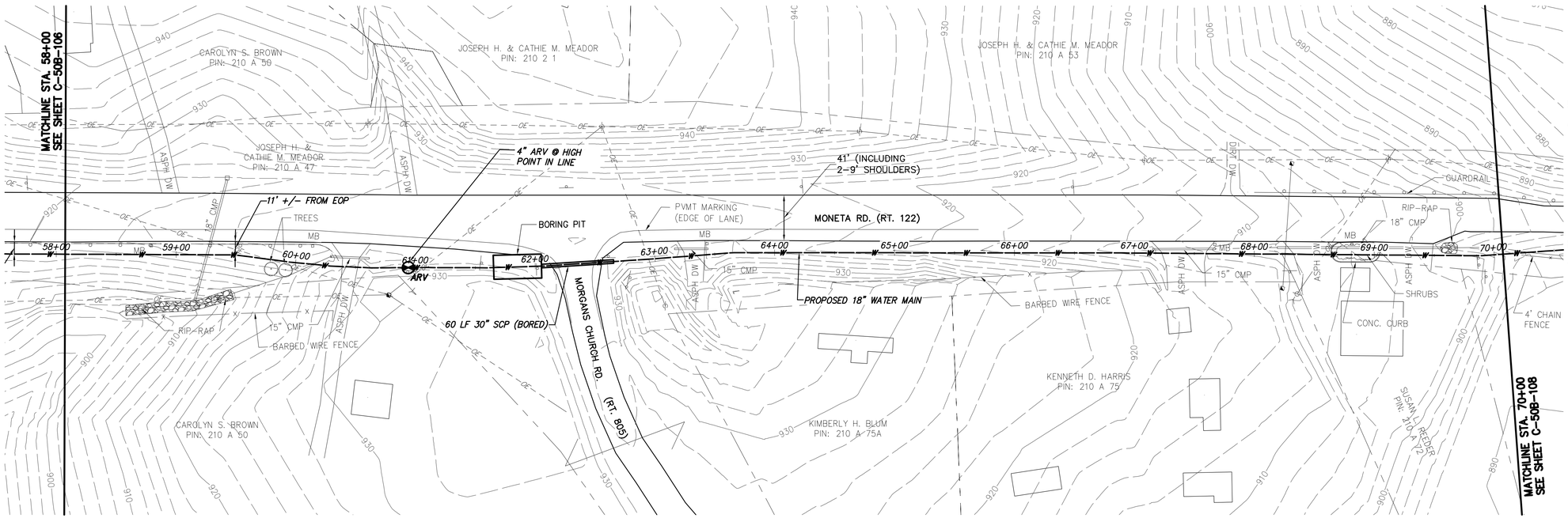
PROJECT NO.
27872

C-50B-106

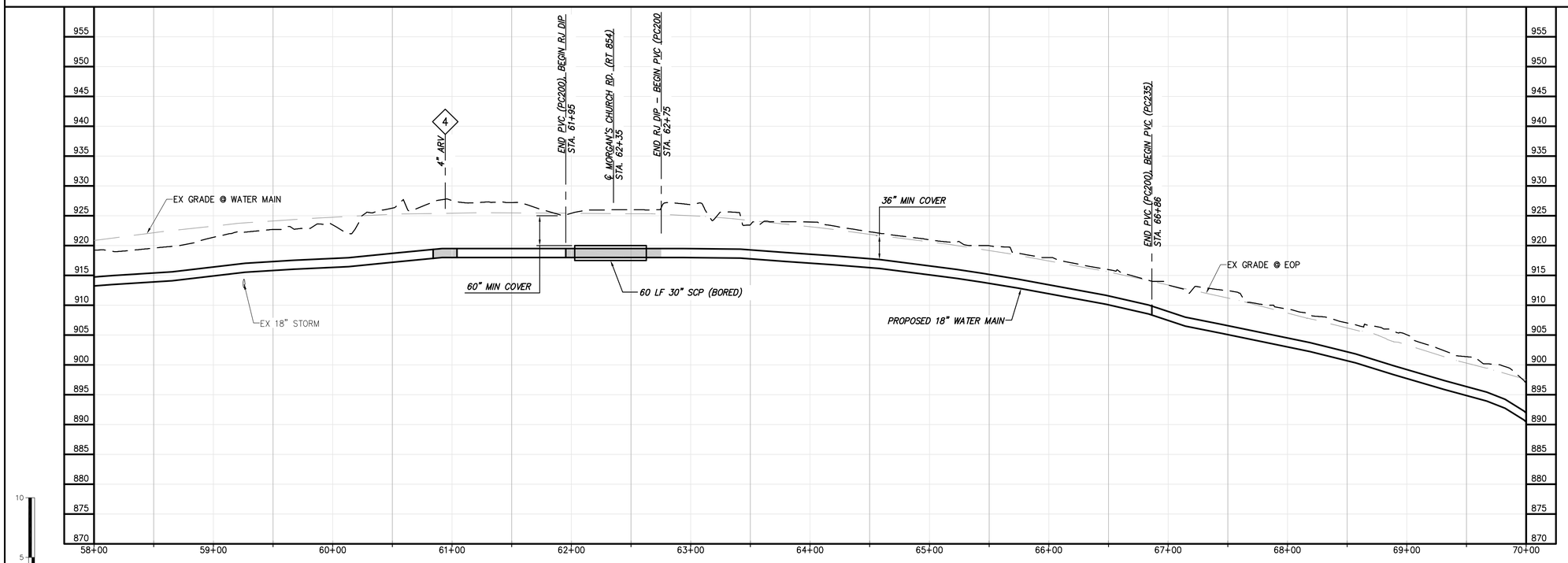
10 5 0
0 50 100
Scale in feet

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-102-106_27872.DWG
Saved: 6/4/2015 11:25:45 AM Plotted: 6/4/2015 11:38:33 AM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ____

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

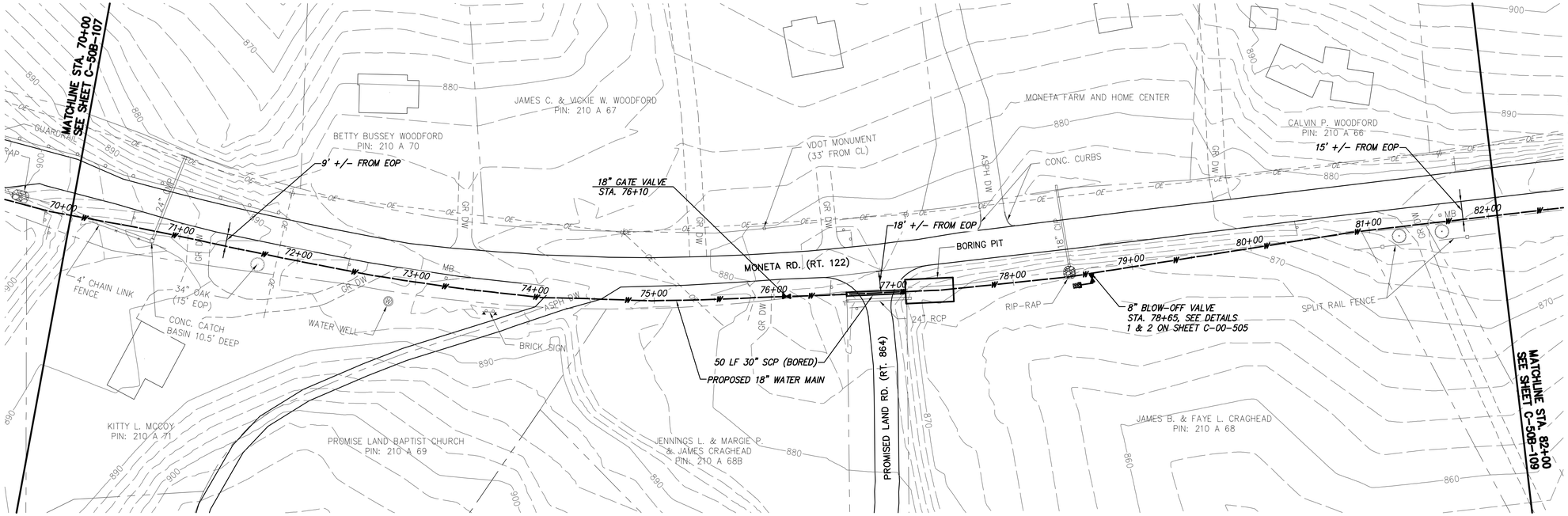
DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

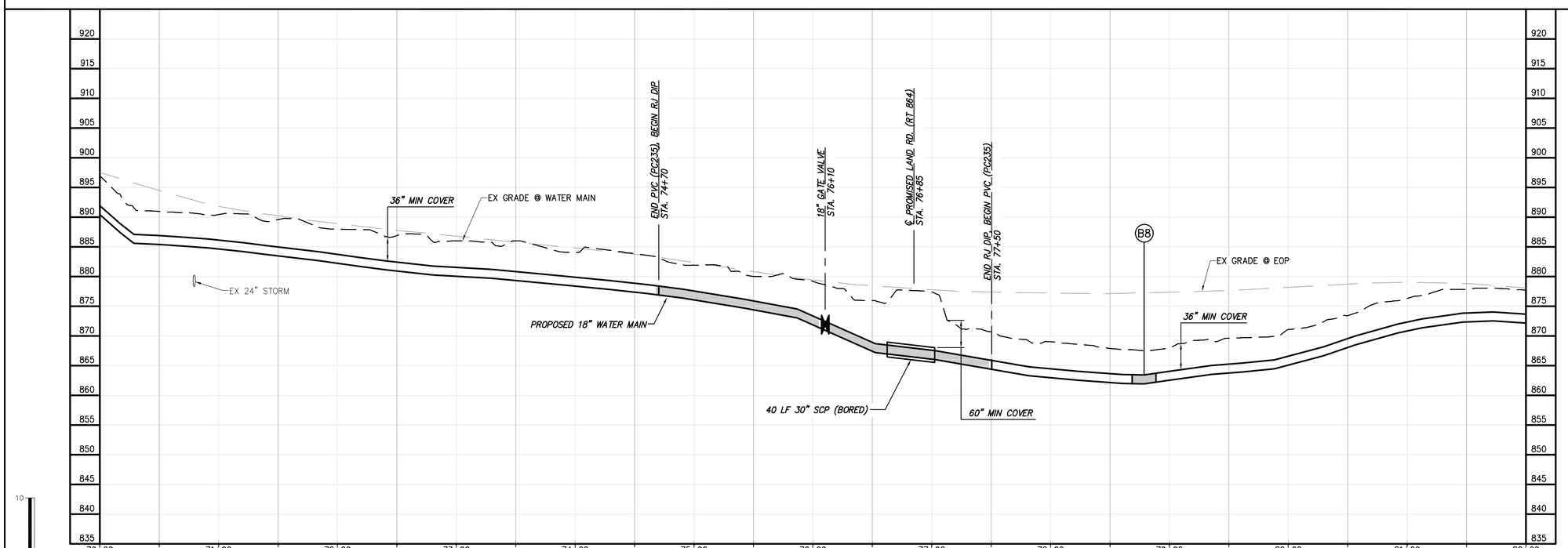
PROJECT NO.
27872

C-50B-107

File: V:\PROJECTS\VIN62\PROJ1\27872\CADD_ACAD\C-50B-107-111_27872.DWG
Saved: 6/4/2015 10:21:25 AM Plotted: 6/4/2015 11:41:06 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

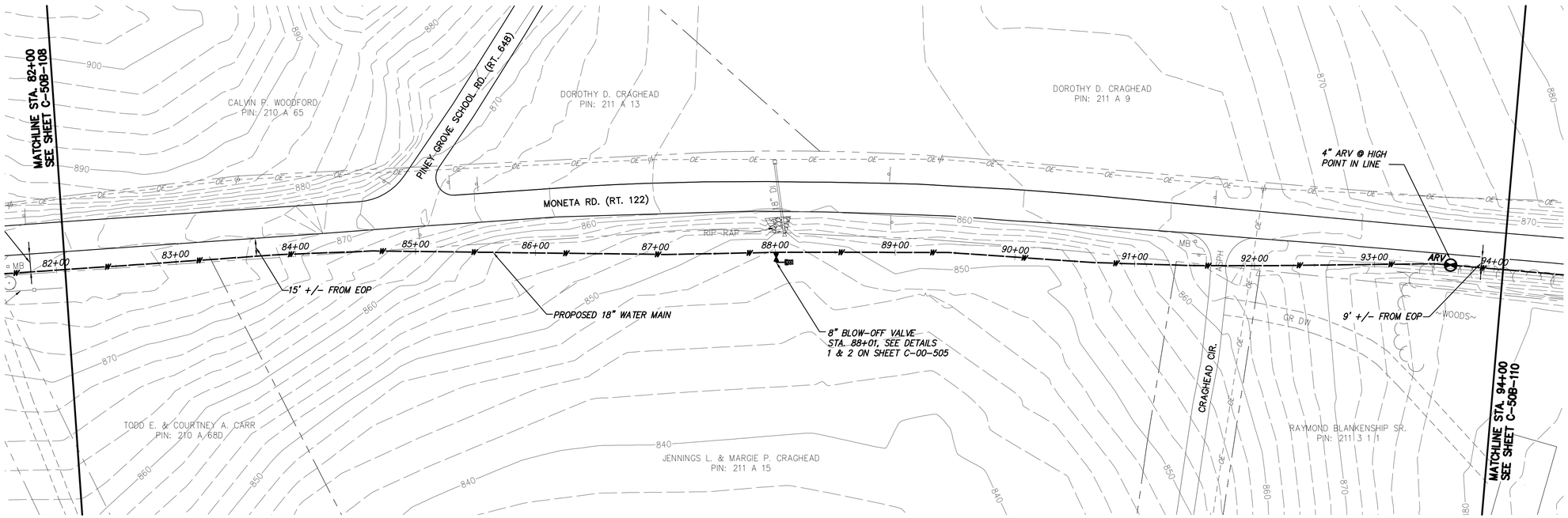
DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50B-108

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-107-111_27872.DWG
Saved: 6/4/2015 10:21:25 AM Plotted: 6/4/2015 11:41:48 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000

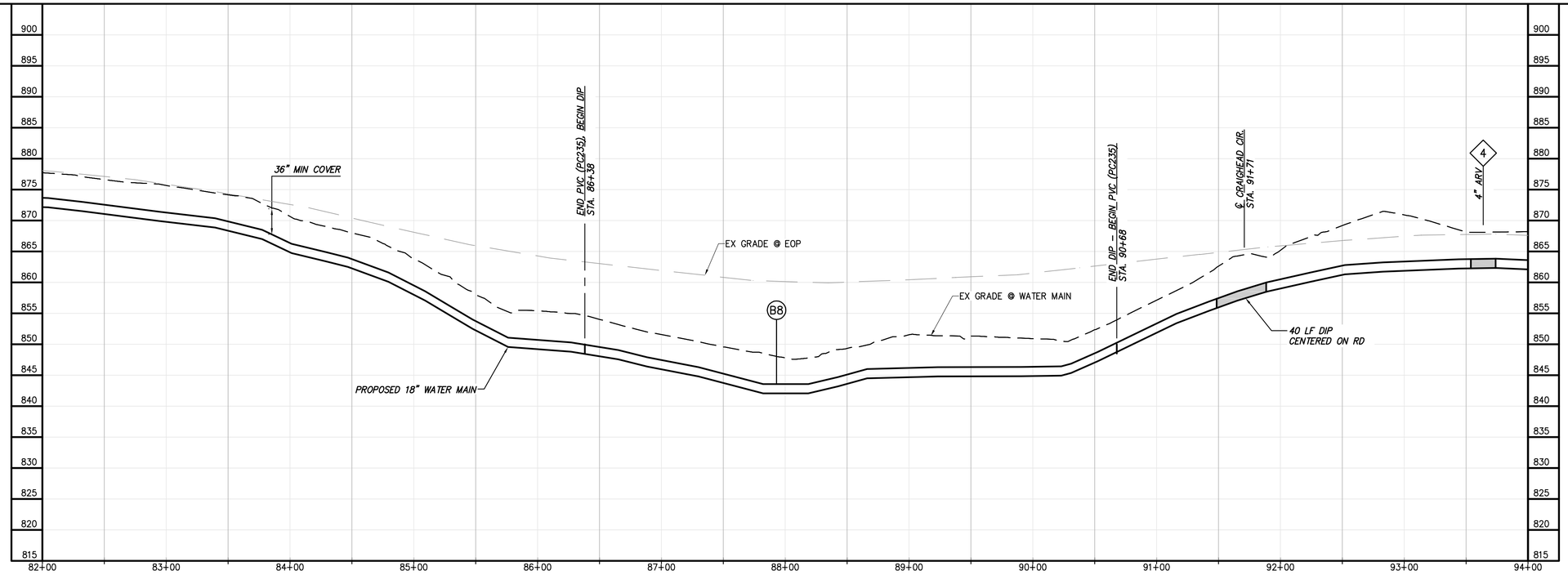


0 50 100
Scale in feet

GENERAL NOTES:

A.

WATER MAIN PLAN



10 5 0
0 50 100
Scale in feet

WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

6/4/2015 — LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
DATE — REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

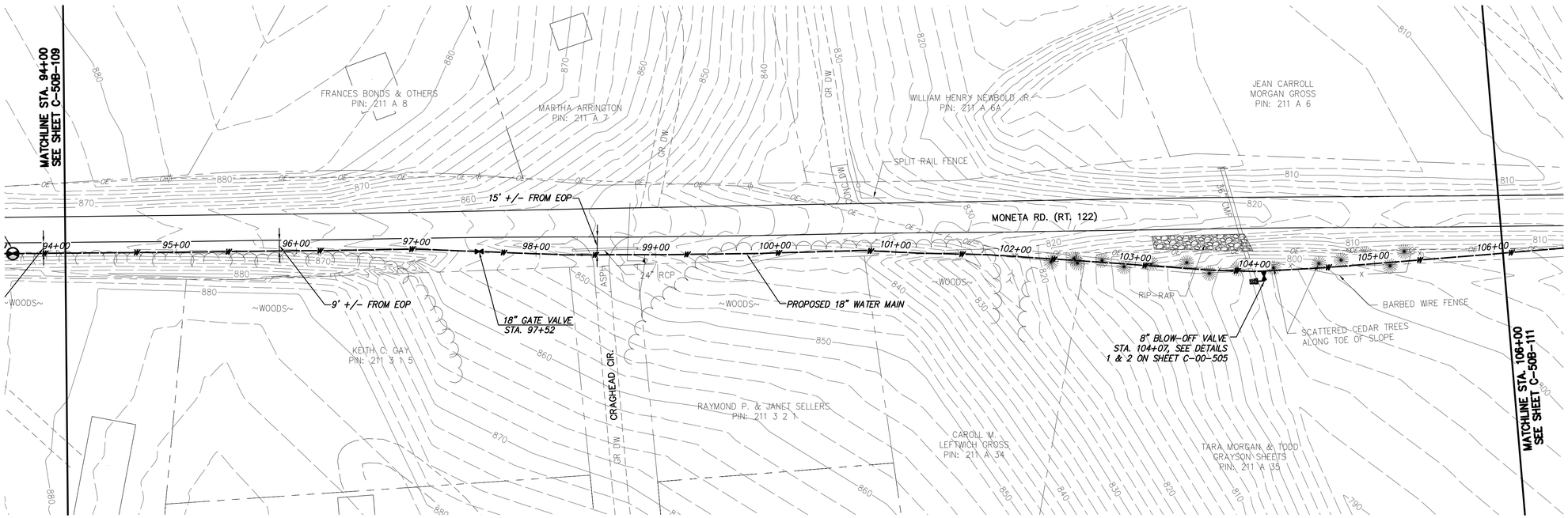
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

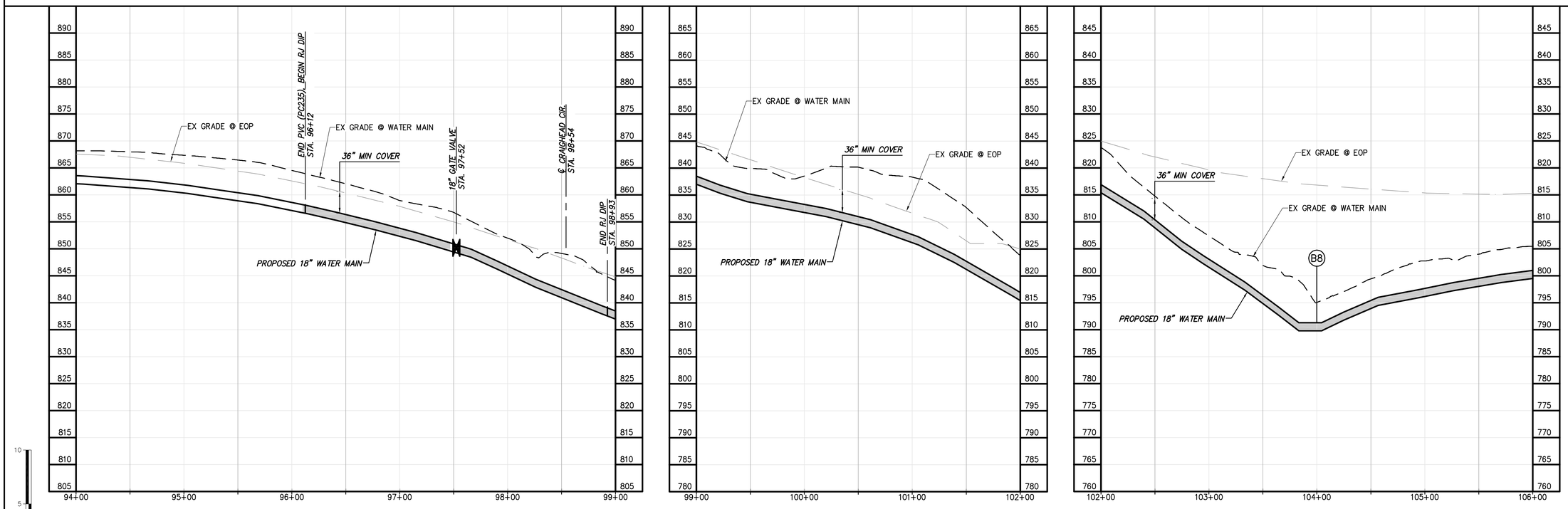
PROJECT NO.
27872

C-50B-109

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-107-111_27872.DWG
Saved: 6/4/2015 10:21:25 AM Plotted: 6/4/2015 11:42:30 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.®
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

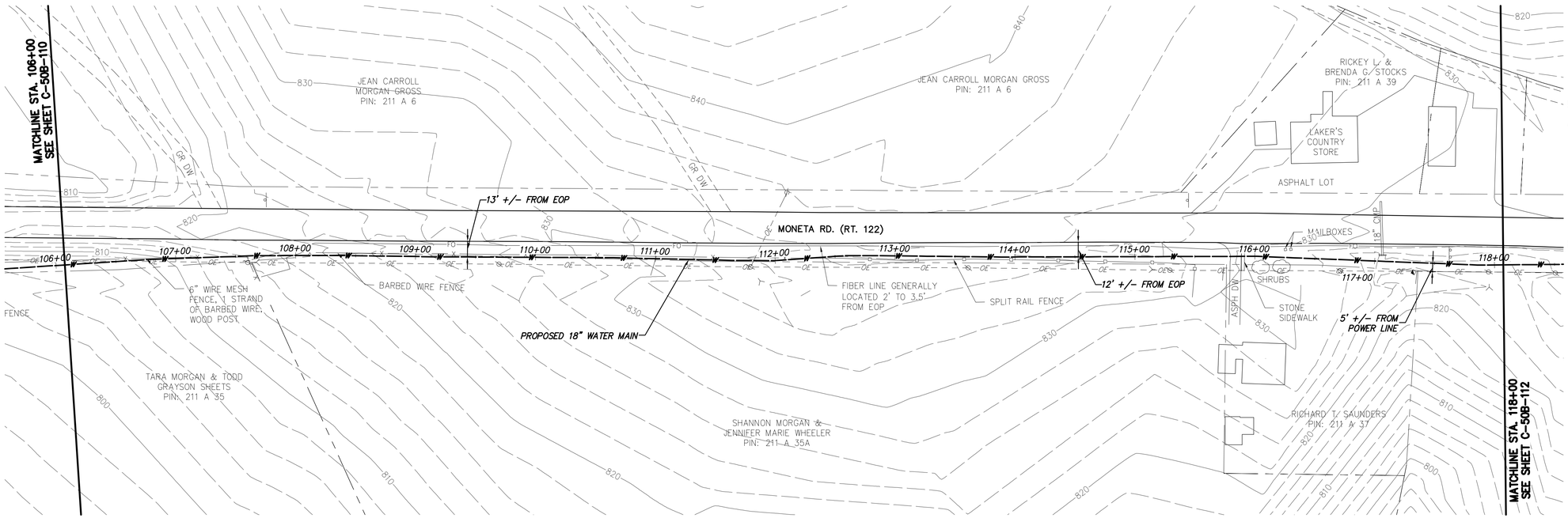
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50B-110

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50B-107-111_27872.DWG
Saved: 6/4/2015 10:21:25 AM Plotted: 6/4/2015 11:43:36 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



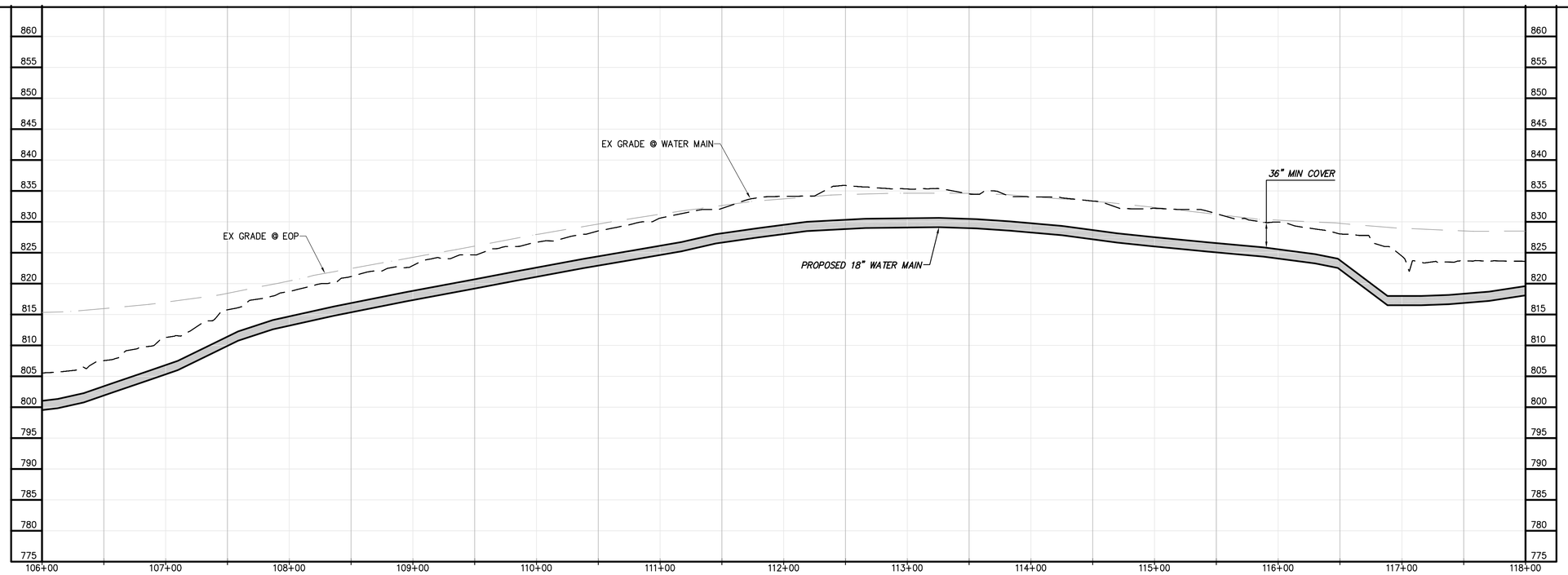
GENERAL NOTES:

A.

SPECIFIC NOTES

1

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:

DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT B WATER MAIN - PLAN AND PROFILE

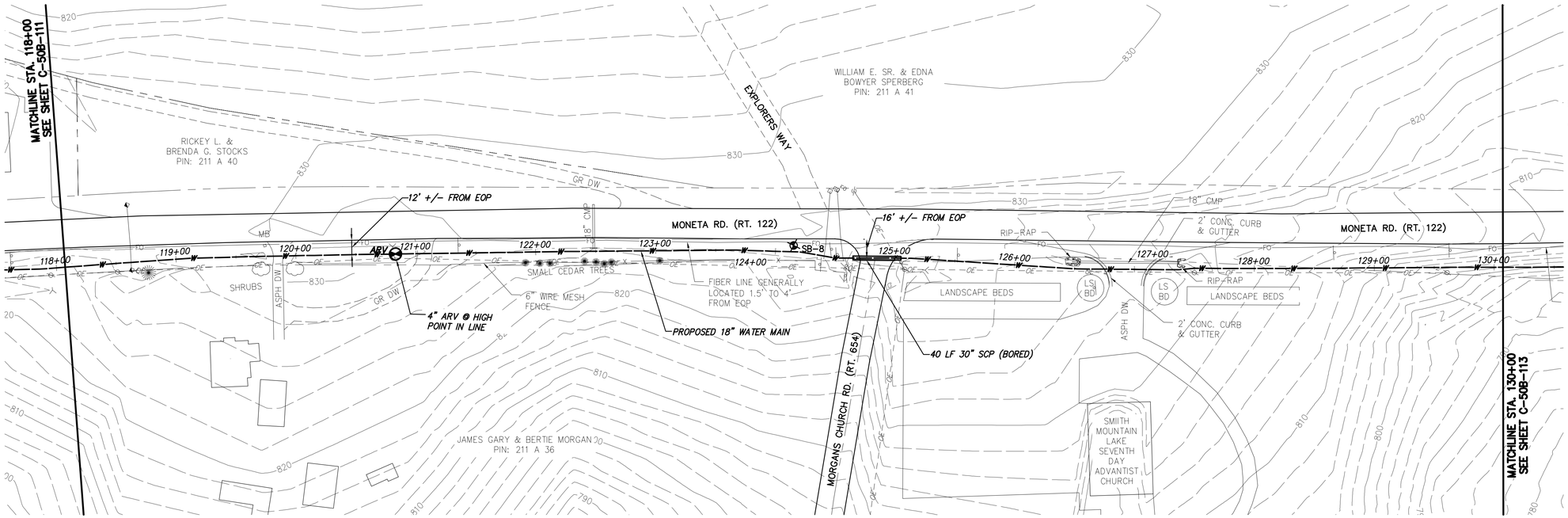
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

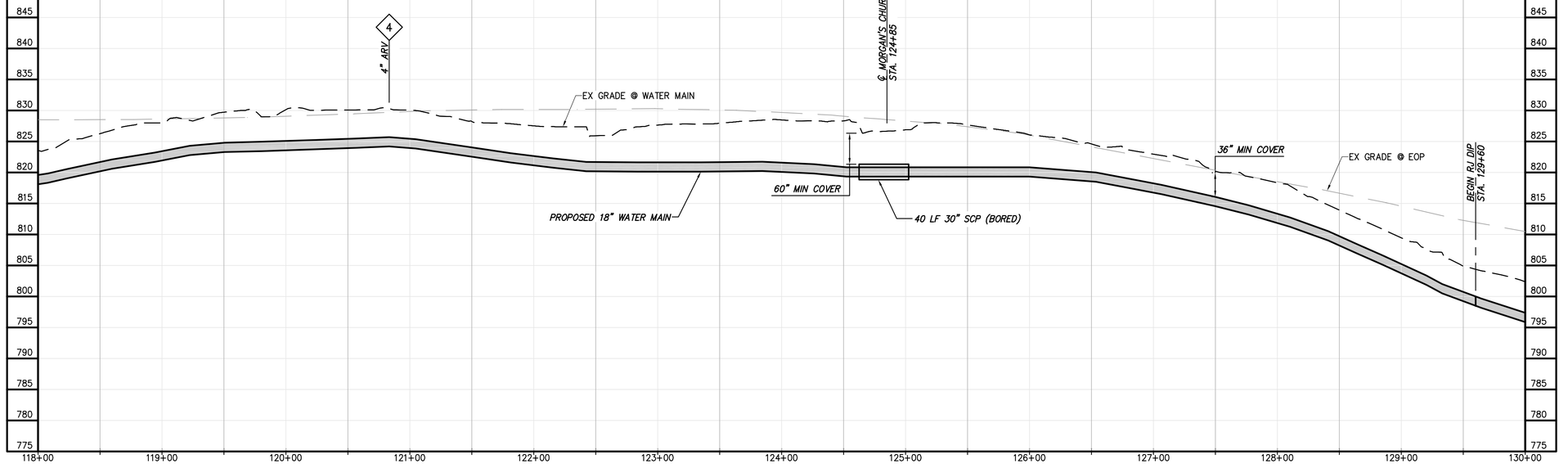
PROJECT NO.
27872

C-50B-111

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-107-111_27872.DWG
Saved: 6/4/2015 10:21:25 AM Plotted: 6/4/2015 11:44:19 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP

DATE: 6/26/14
REVISIONS AND RECORD OF ISSUE: FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

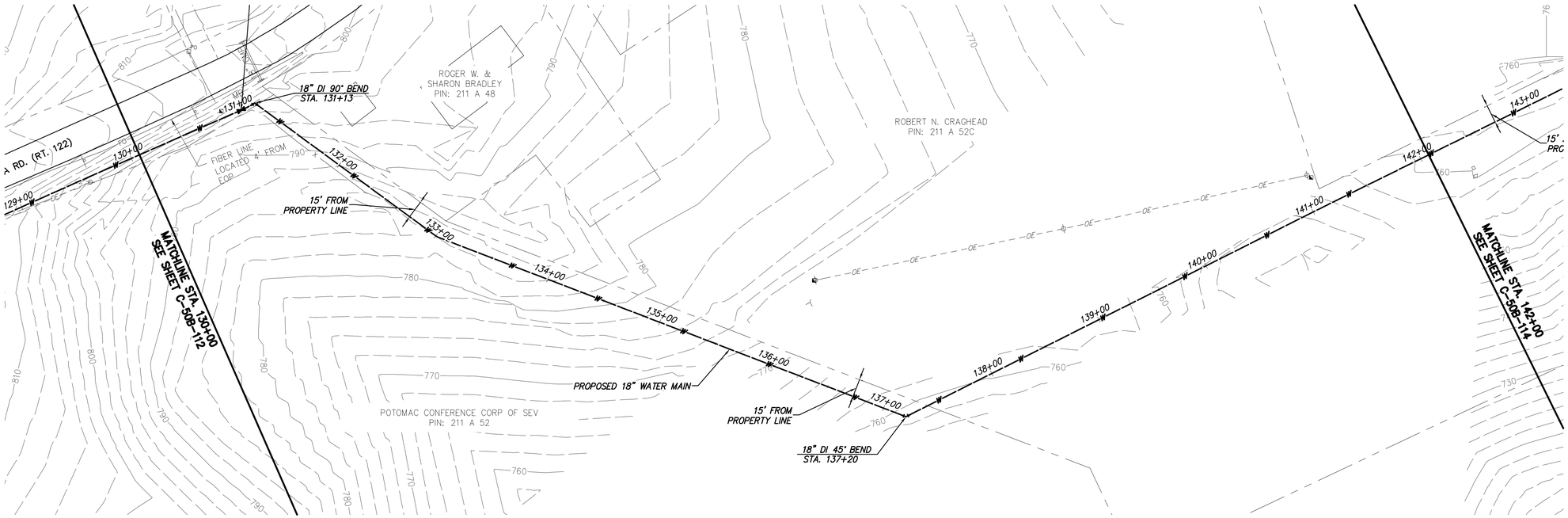
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

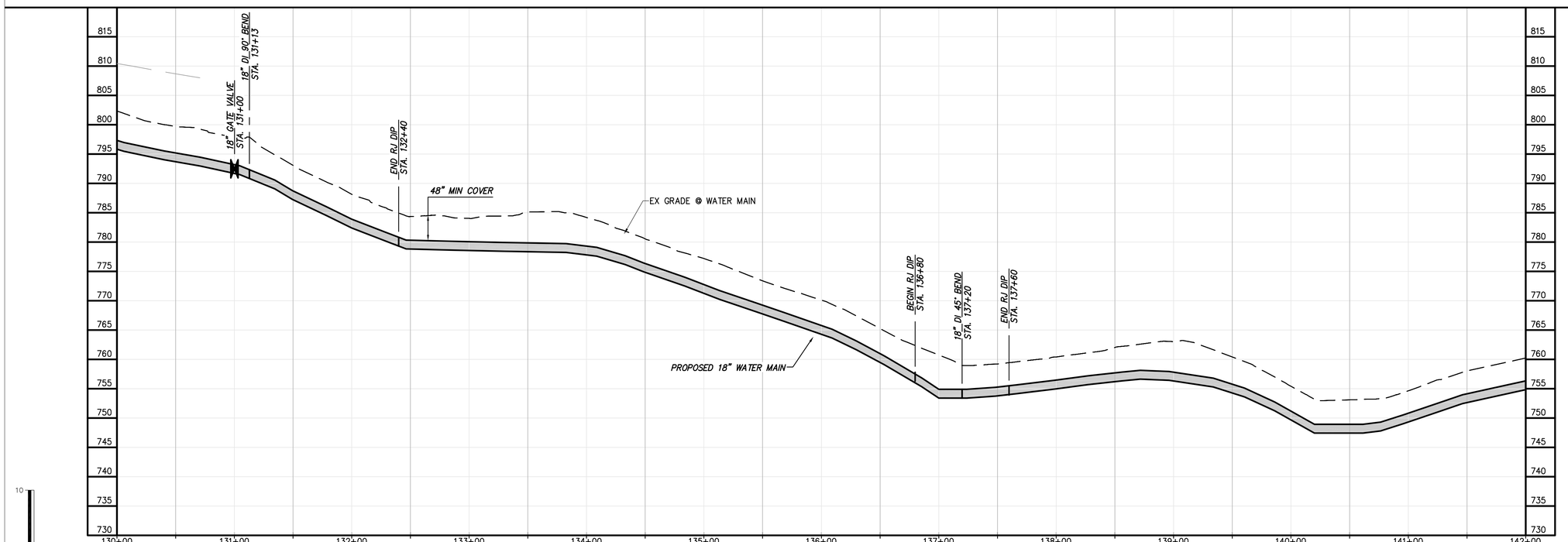
PROJECT NO.
27872

C-50B-112
SHEET
OF

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50B-112-116_27872.DWG
Saved: 6/4/2015 10:22:05 AM Plotted: 6/4/2015 11:46:38 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100 Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

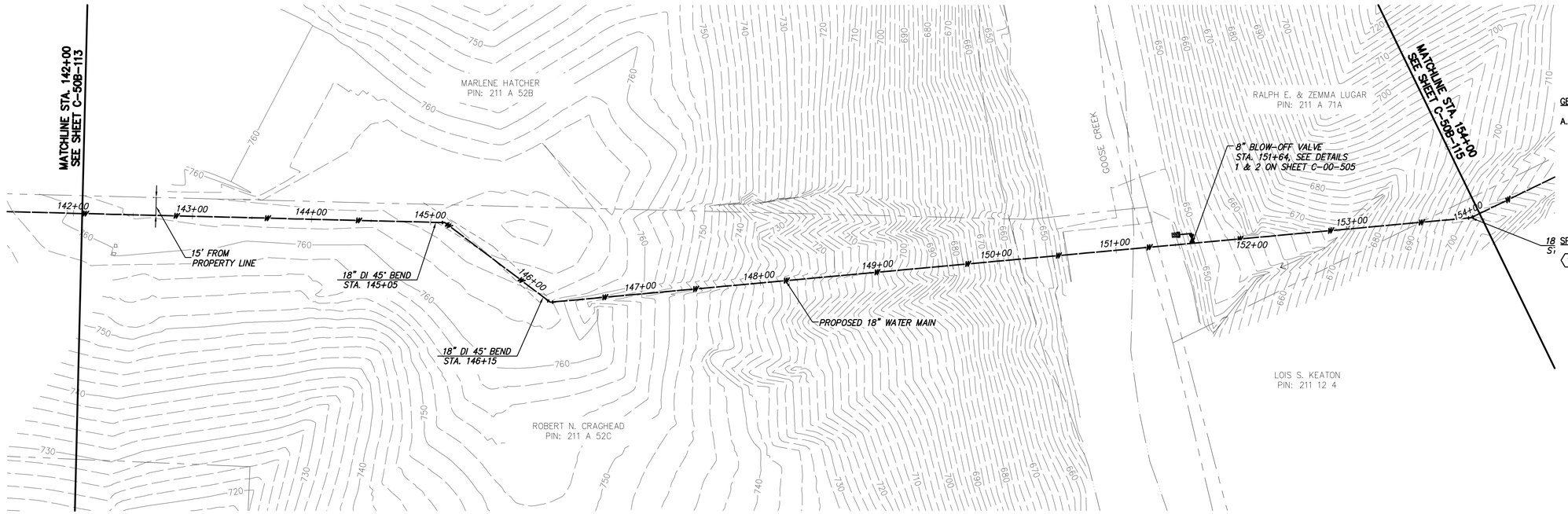
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

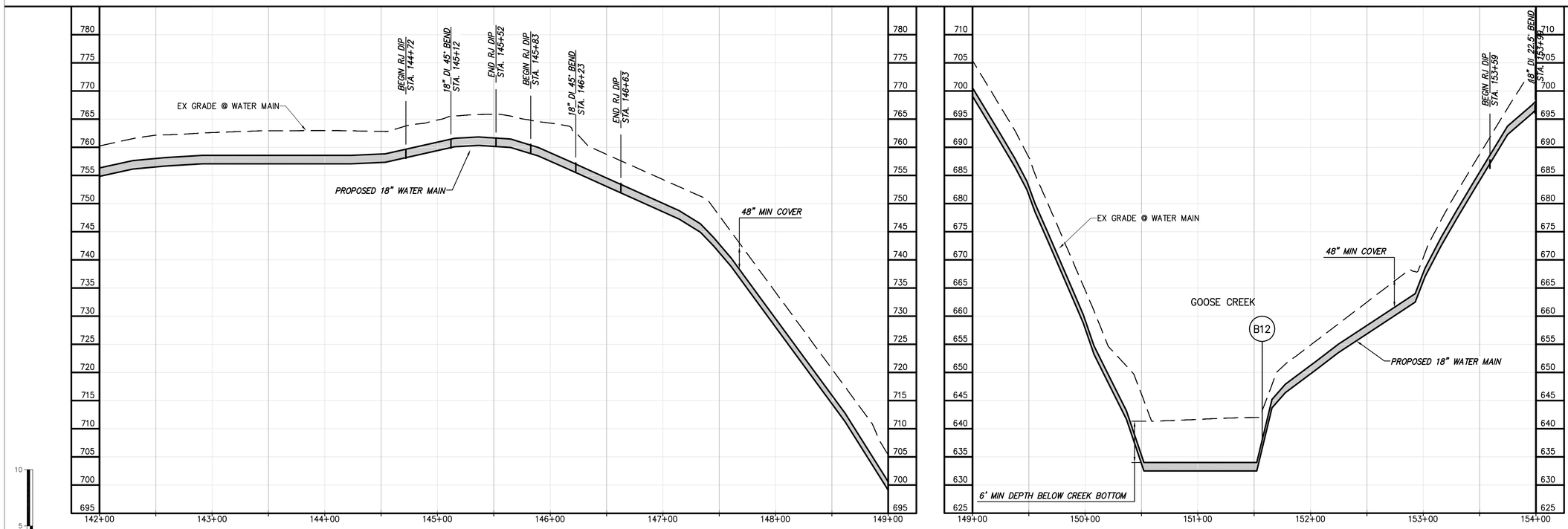
C-50B-113
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-112-116_27872.DWG
Saved: 6/4/2015 10:22:05 AM Plotted: 6/4/2015 11:47:16 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
6/26/14	FINAL GMP SUBMITTAL TO OWNER		
DATE	REVISIONS AND RECORD OF ISSUE		

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

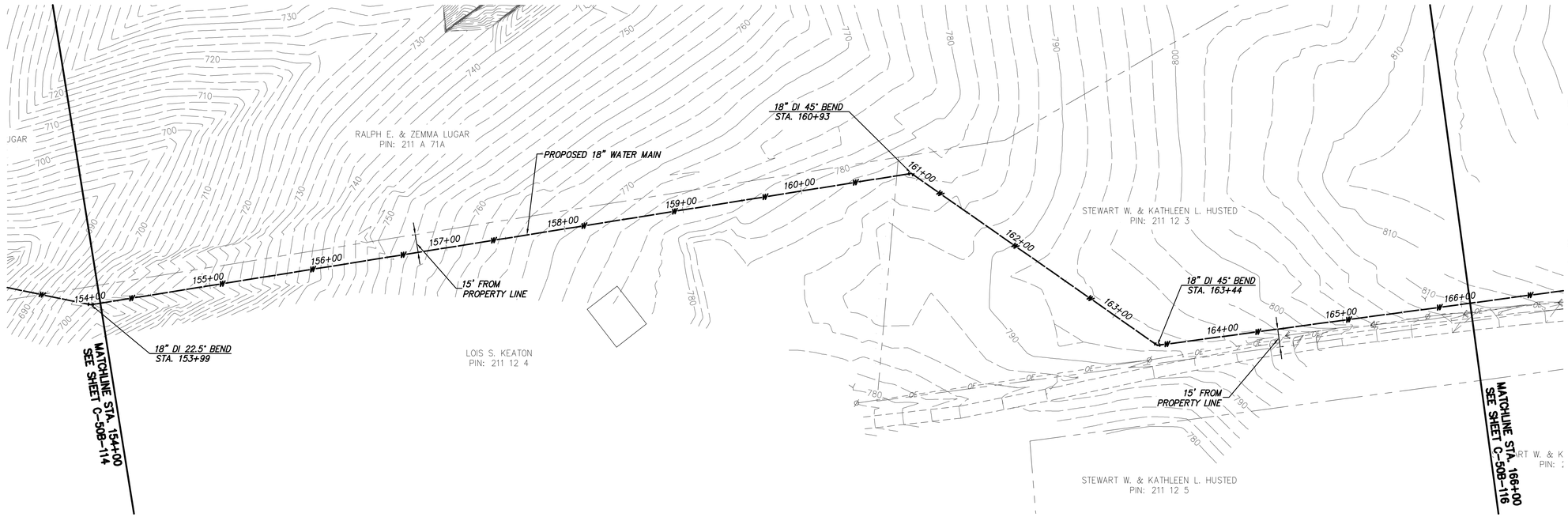
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

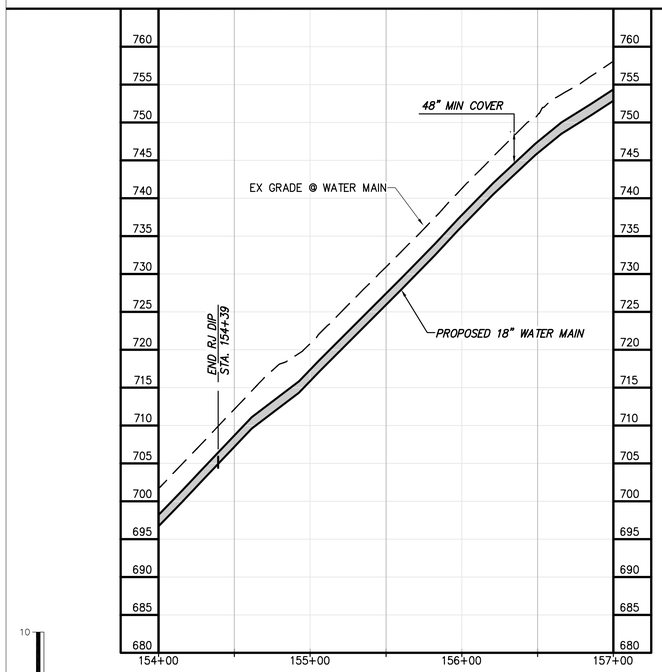
PROJECT NO.
27872

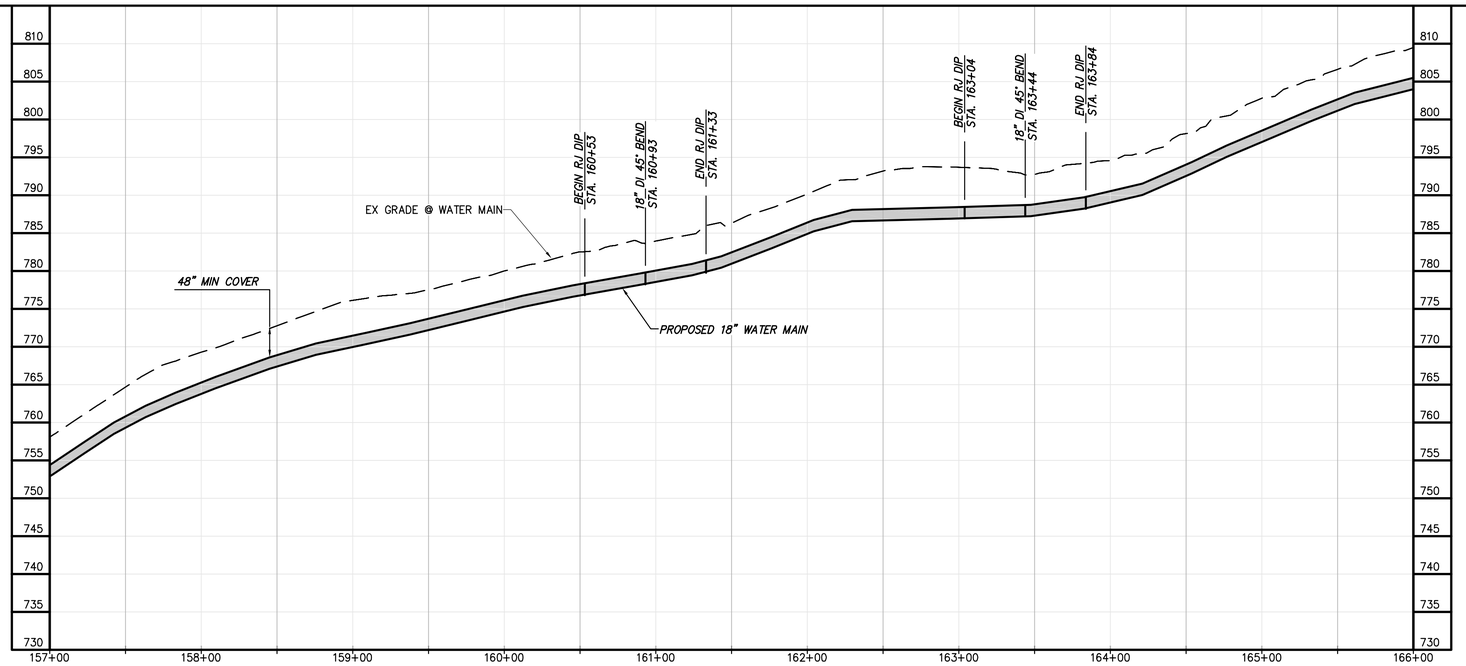
C-50B-114
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-112-116_27872.DWG
Saved: 6/4/2015 10:22:05 AM Plotted: 6/4/2015 11:48:12 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN





WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
DATE	REVISIONS AND RECORD OF ISSUE		
6/26/14	FINAL GMP SUBMITTAL TO OWNER		

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

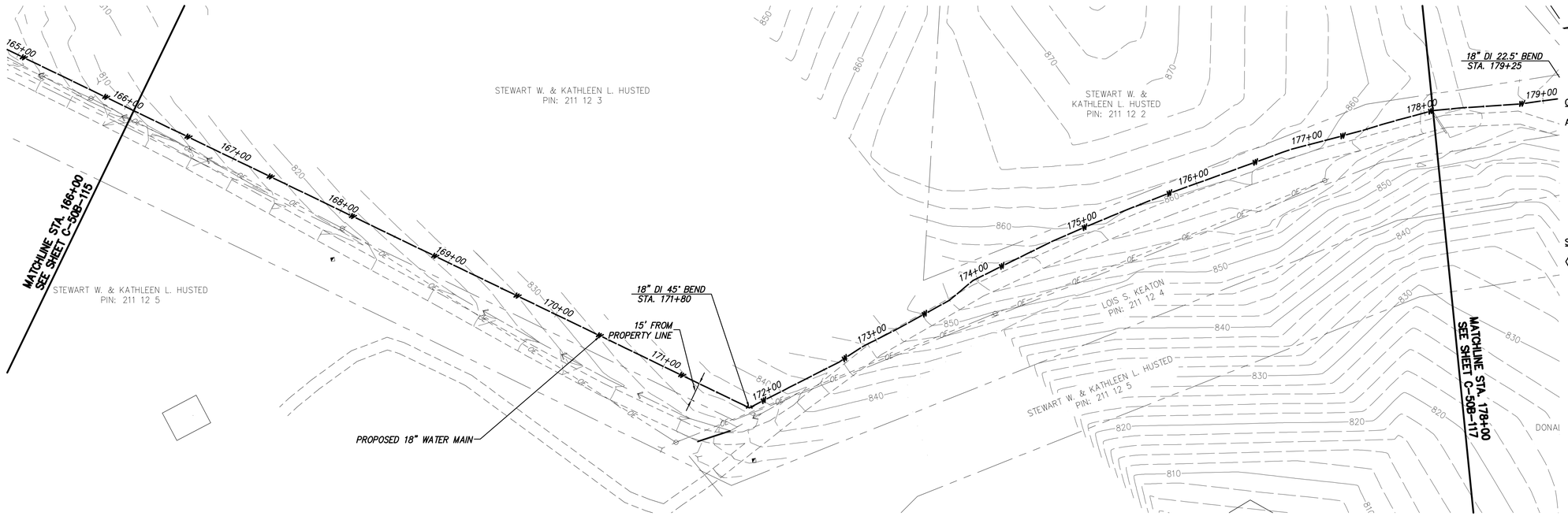
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

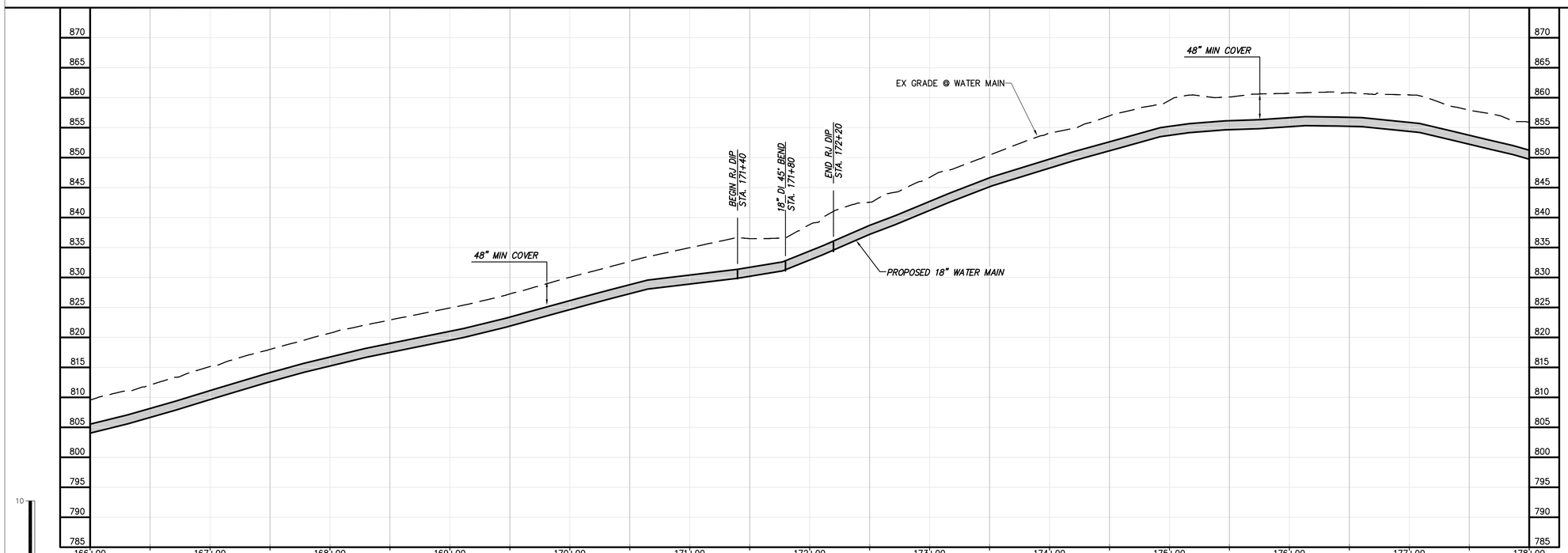
C-50B-115
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-112-116_27872.DWG
Saved: 6/4/2015 10:22:05 AM Plotted: 6/4/2015 11:49:06 AM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP

6/25/14 FINAL GMP SUBMITTAL TO OWNER
DATE REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0436 www.chacompanies.com

0 50 100
Scale in feet

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

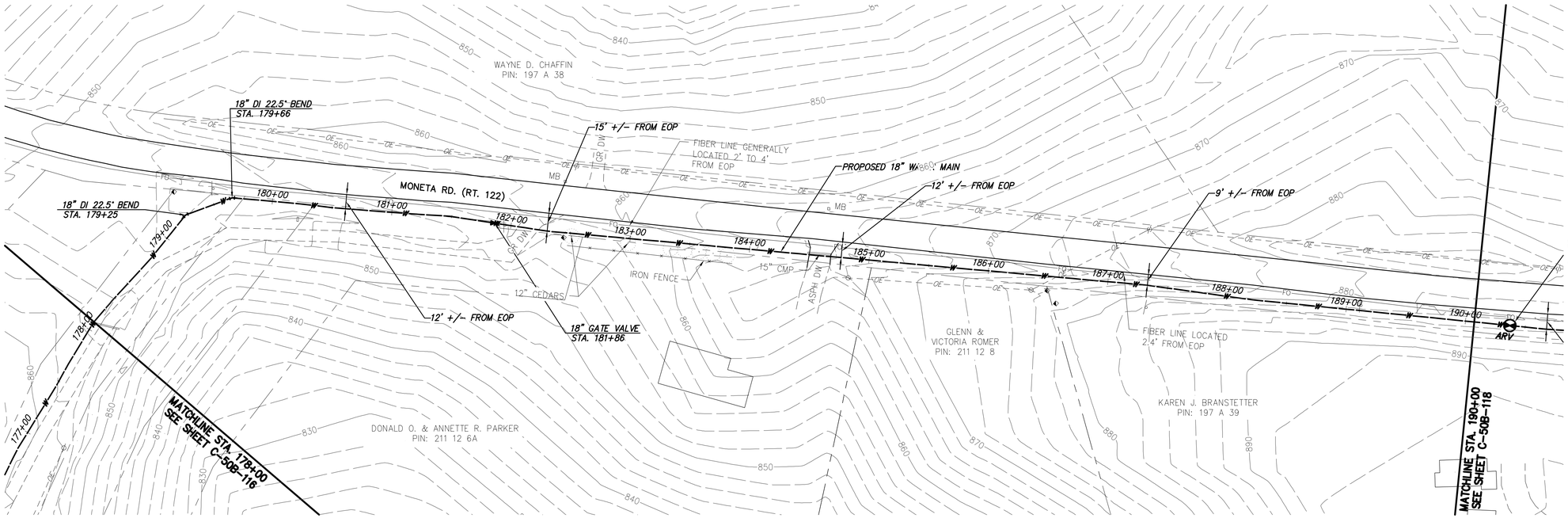
PROJECT NO.
27872

C-50B-116
SHEET
OF

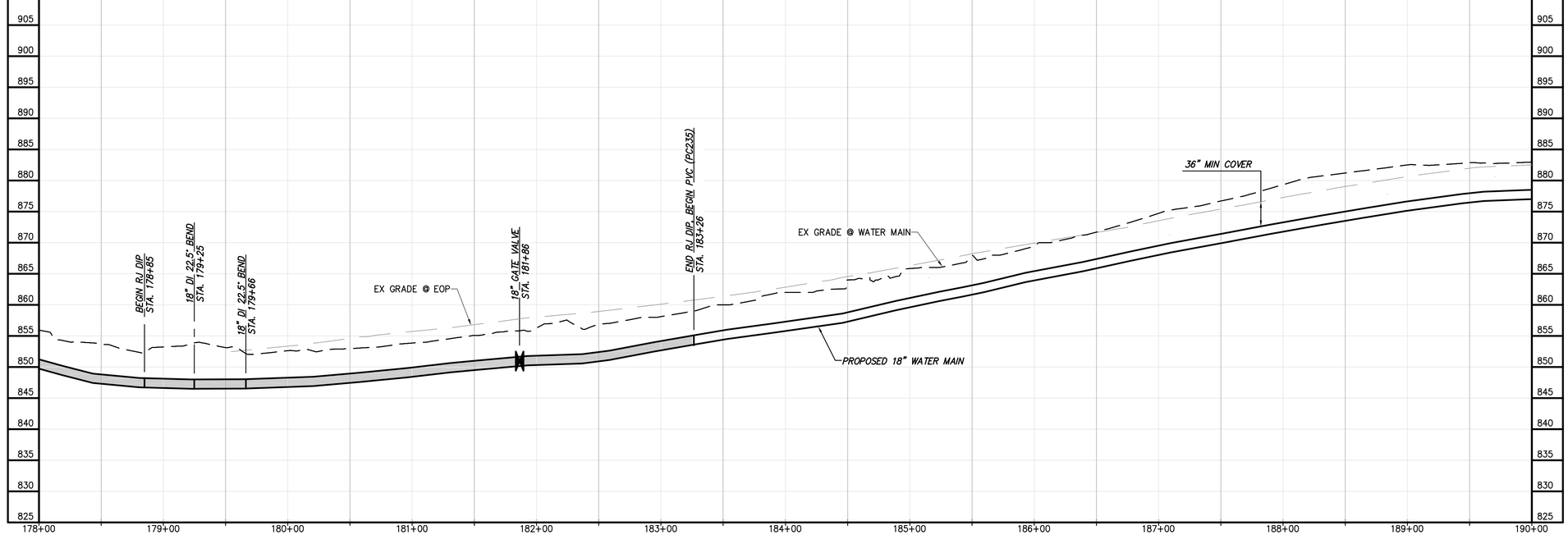
PRELIMINARY - NOT FOR CONSTRUCTION

10 5 0
0 50 100
Scale in feet

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-112-116_27872.DWG
Saved: 6/4/2015 10:22:05 AM Plotted: 6/4/2015 11:49:47 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

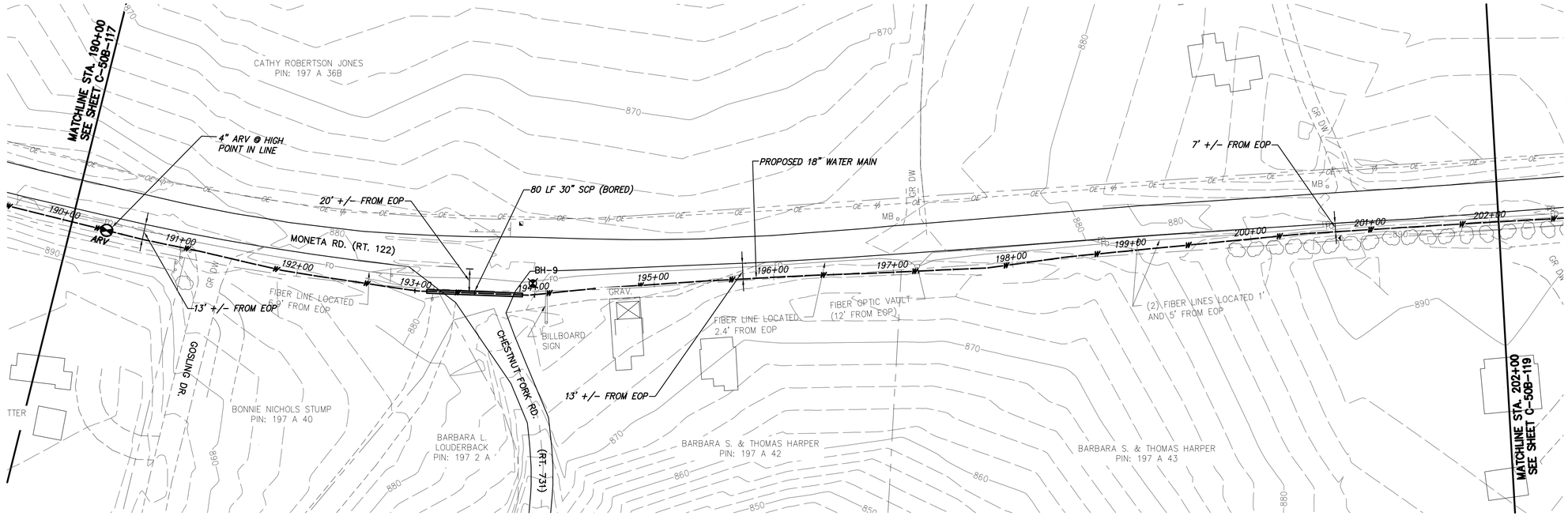
PROJECT NO.
27872

C-50B-117
SHEET
OF

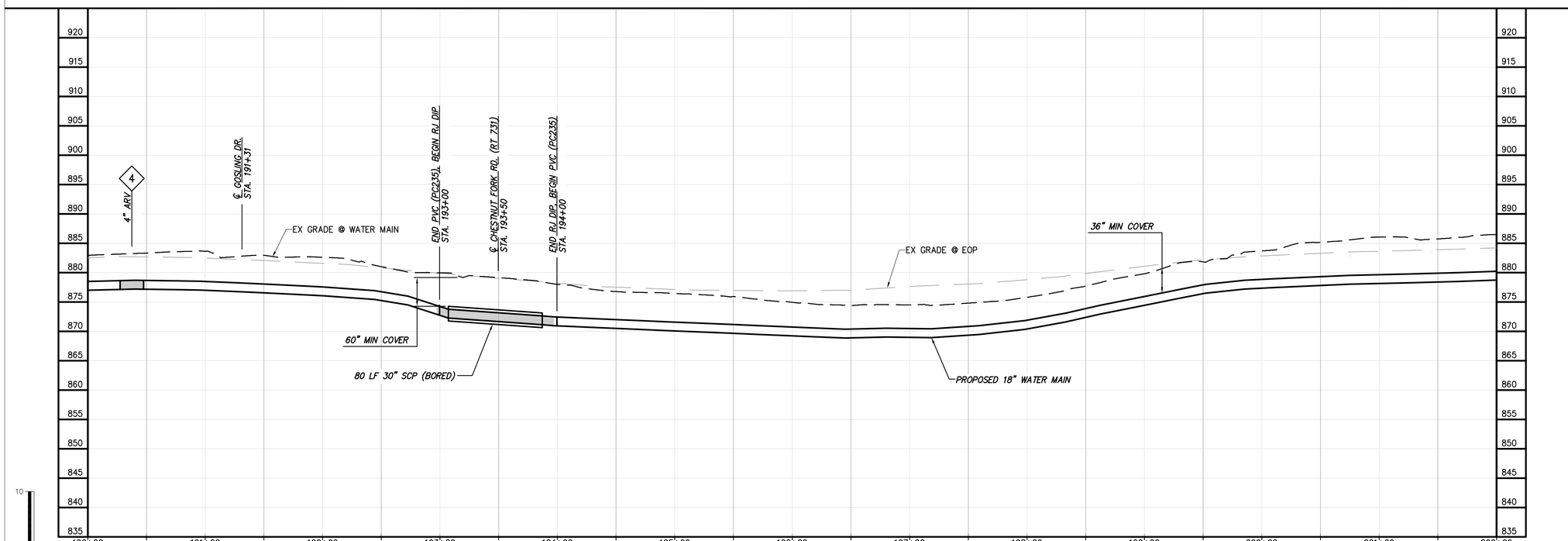
PRELIMINARY - NOT FOR CONSTRUCTION

0 50 100
Scale in feet

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-117-121_27872.DWG
Saved: 6/4/2015 10:22:45 AM Plotted: 6/4/2015 11:52:08 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/25/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

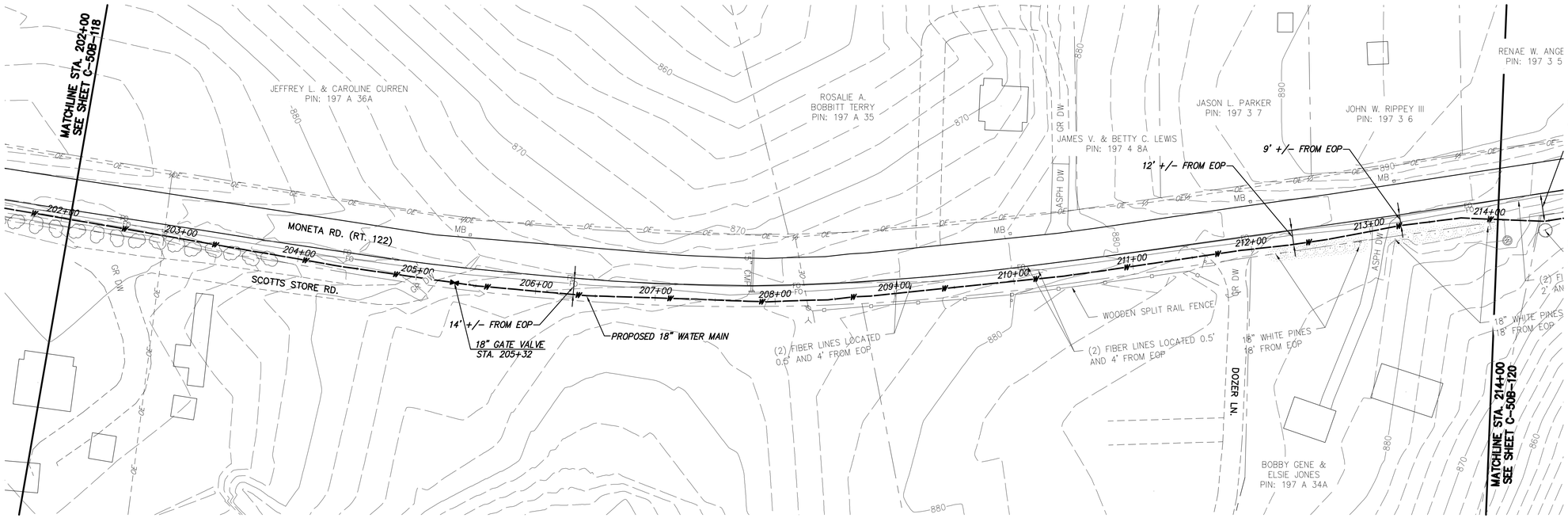
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

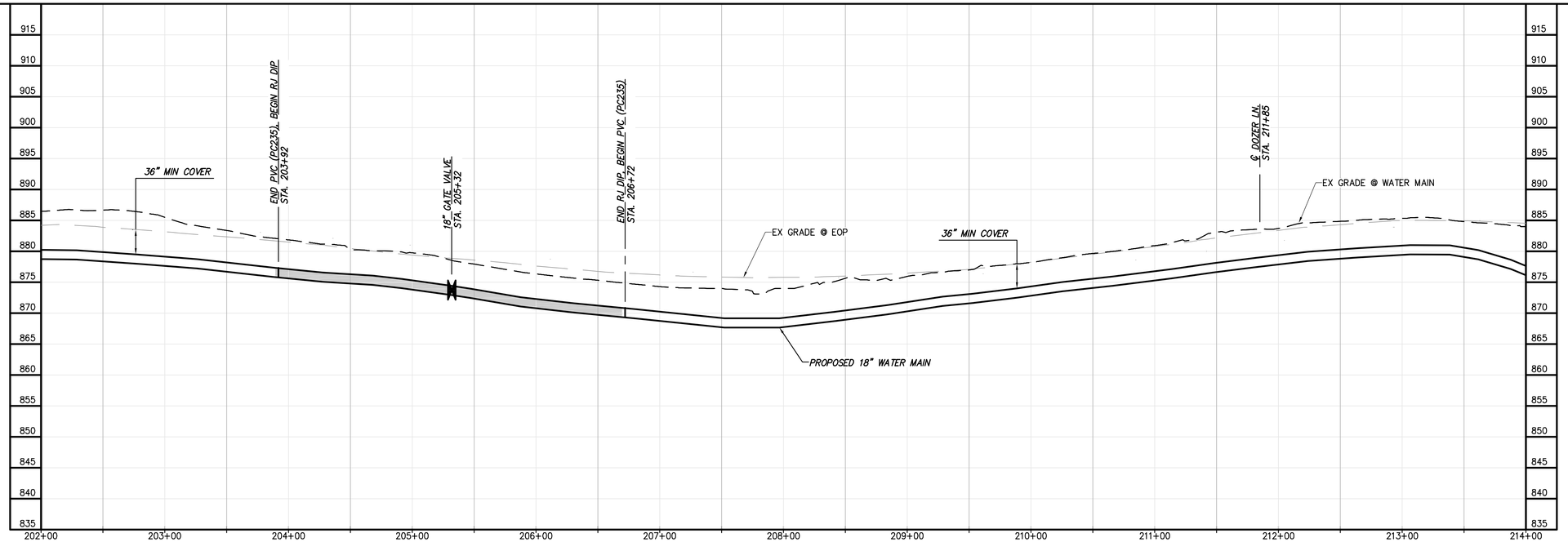
PROJECT NO.
27872

C-50B-118
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-117-121_27872.DWG
Saved: 6/4/2015 10:22:45 AM Plotted: 6/4/2015 11:52:50 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/25/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

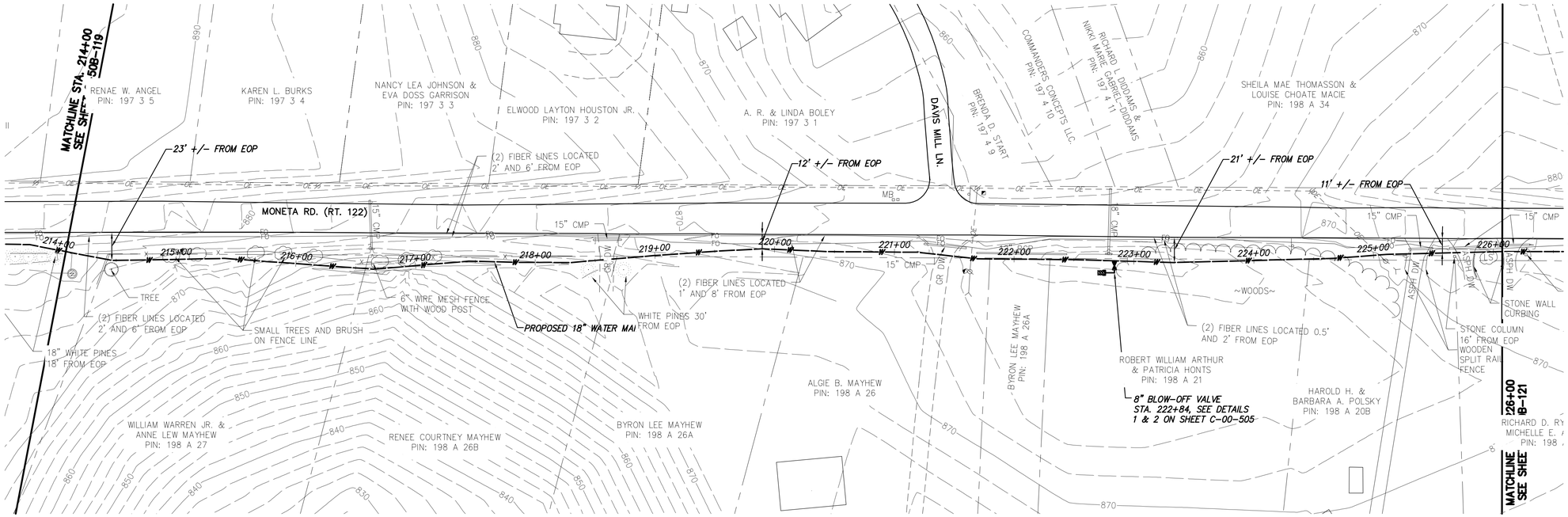
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

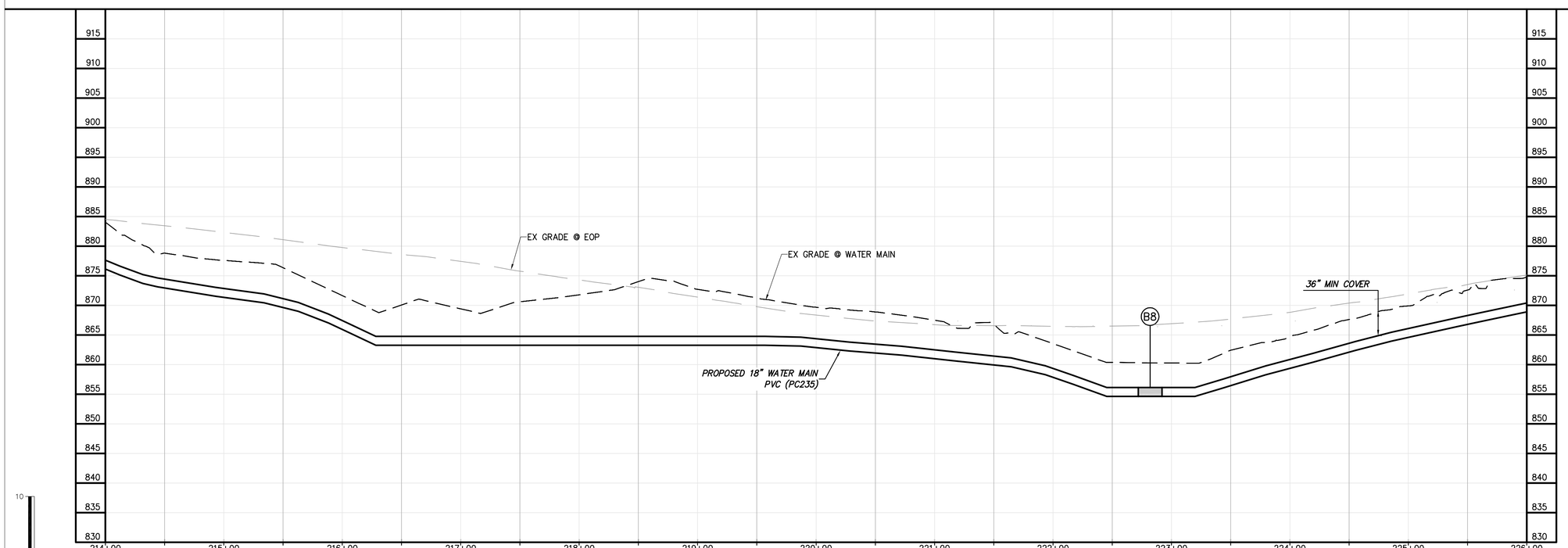
PROJECT NO.
27872

C-50B-119
SHEET
OF

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50B-117-121_27872.DWG
Saved: 6/4/2015 10:22:45 AM Plotted: 6/4/2015 11:53:31 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

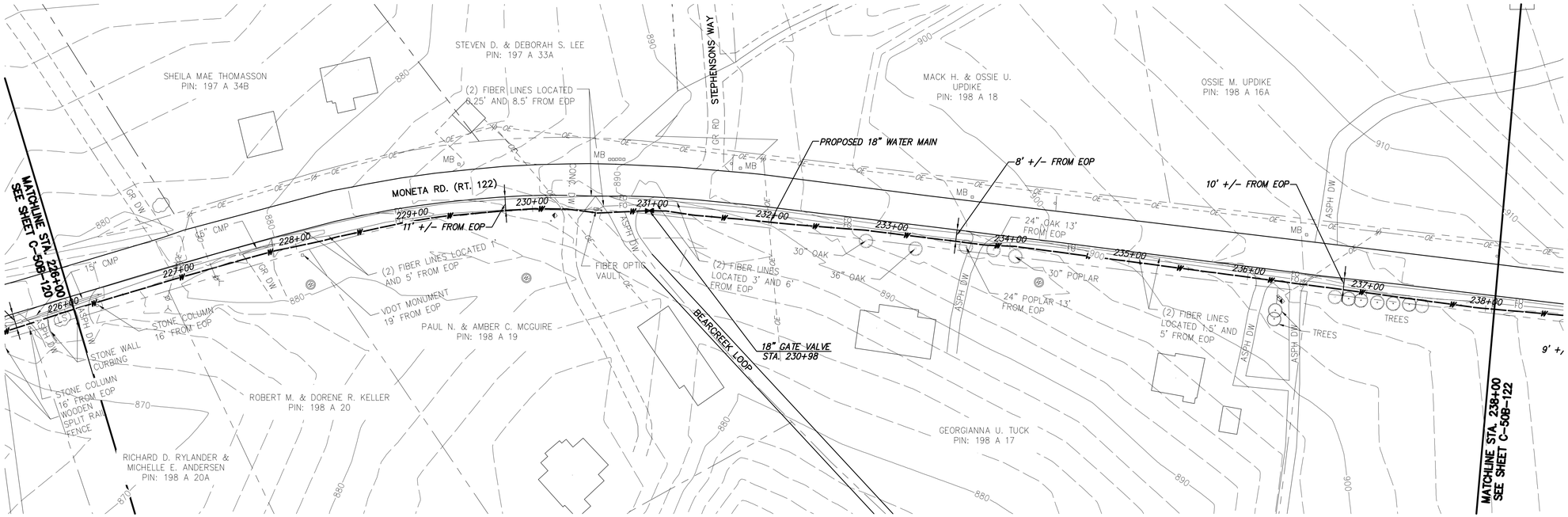
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

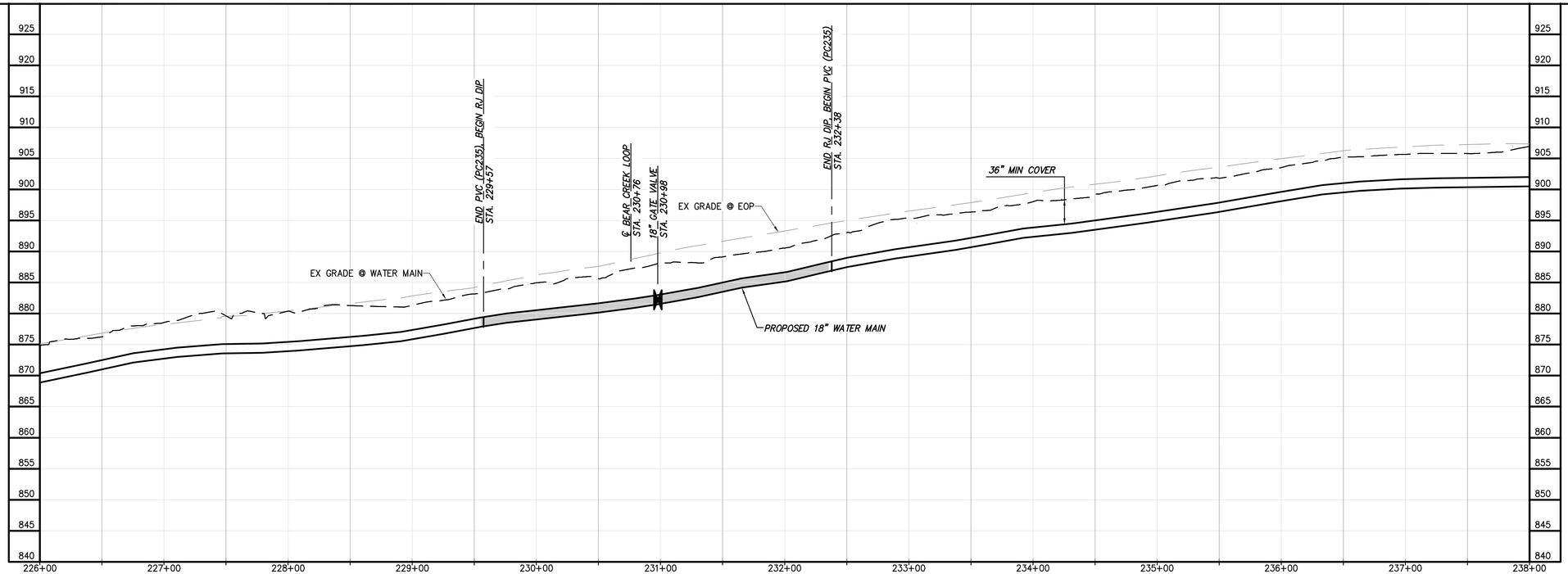
C-50B-120
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-117-121_27872.DWG
Saved: 6/4/2015 10:22:45 AM Plotted: 6/4/2015 11:54:12 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:
A.

SPECIFIC NOTES
1 ——

NO.	BY	CK	APP

DATE	REVISIONS AND RECORD OF ISSUE
6/25/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

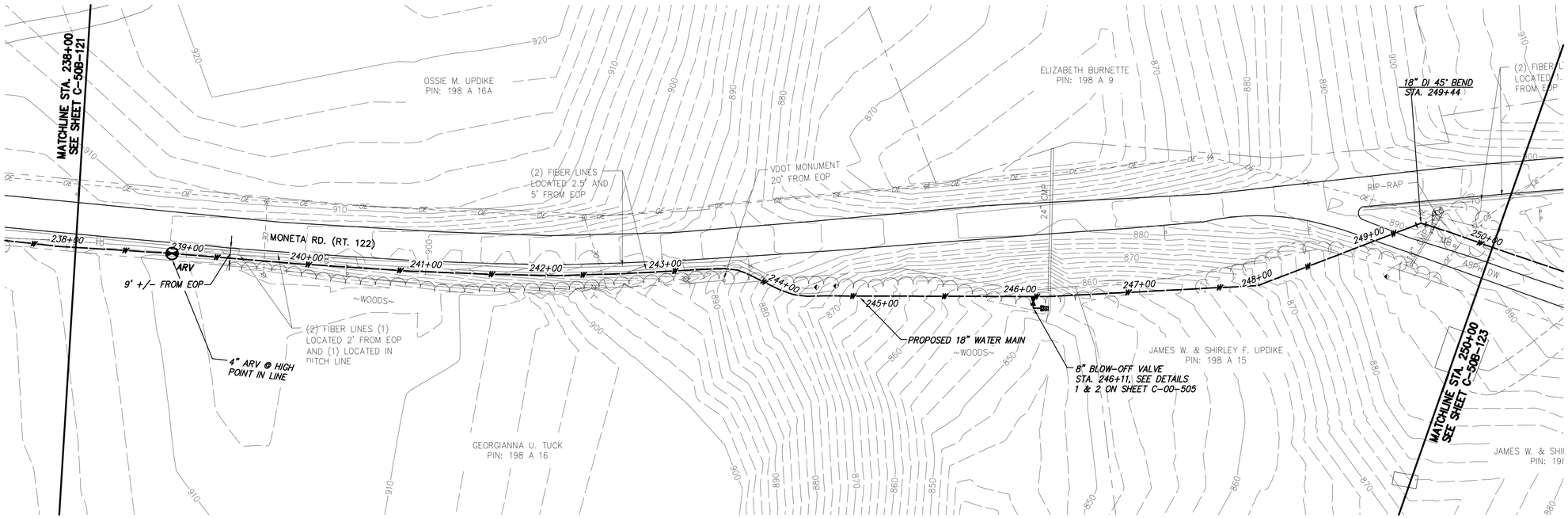
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

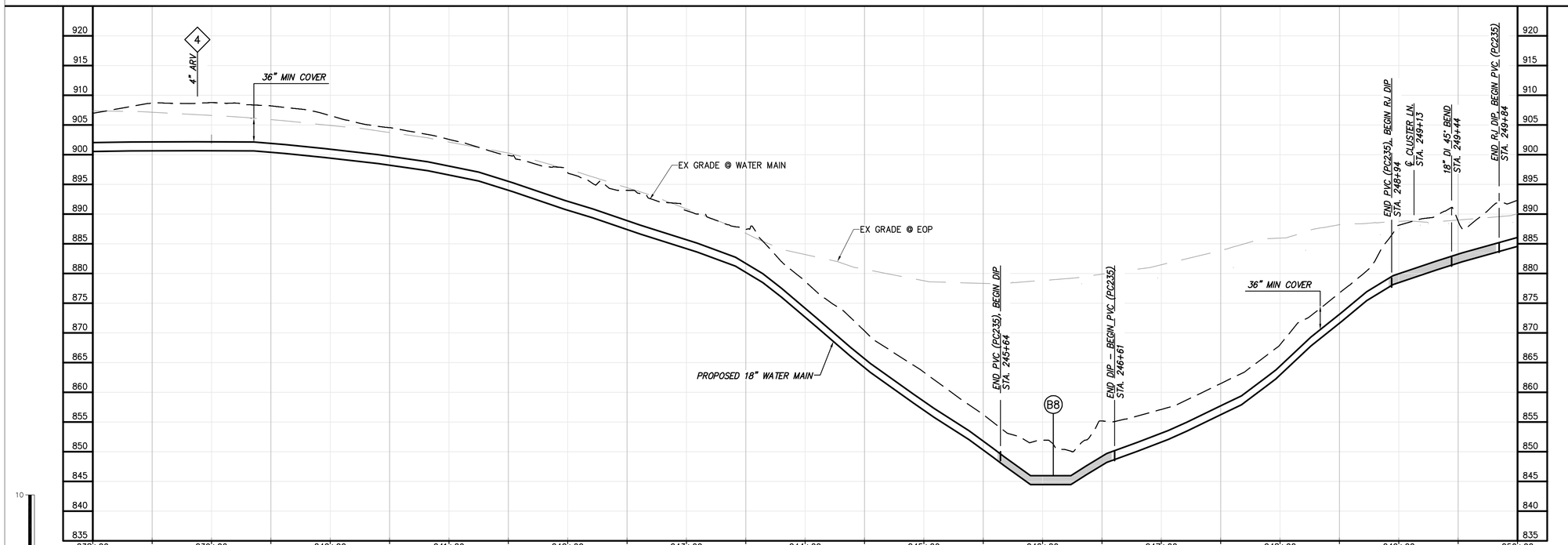
PROJECT NO.
27872

C-50B-121
SHEET
OF

File: V:\PROJECTS\VN62\PROJ\27872\CADD_ACAD\C-50B-117-121_27872.DWG
Saved: 6/4/2015 10:22:45 AM Plotted: 6/4/2015 11:54:53 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

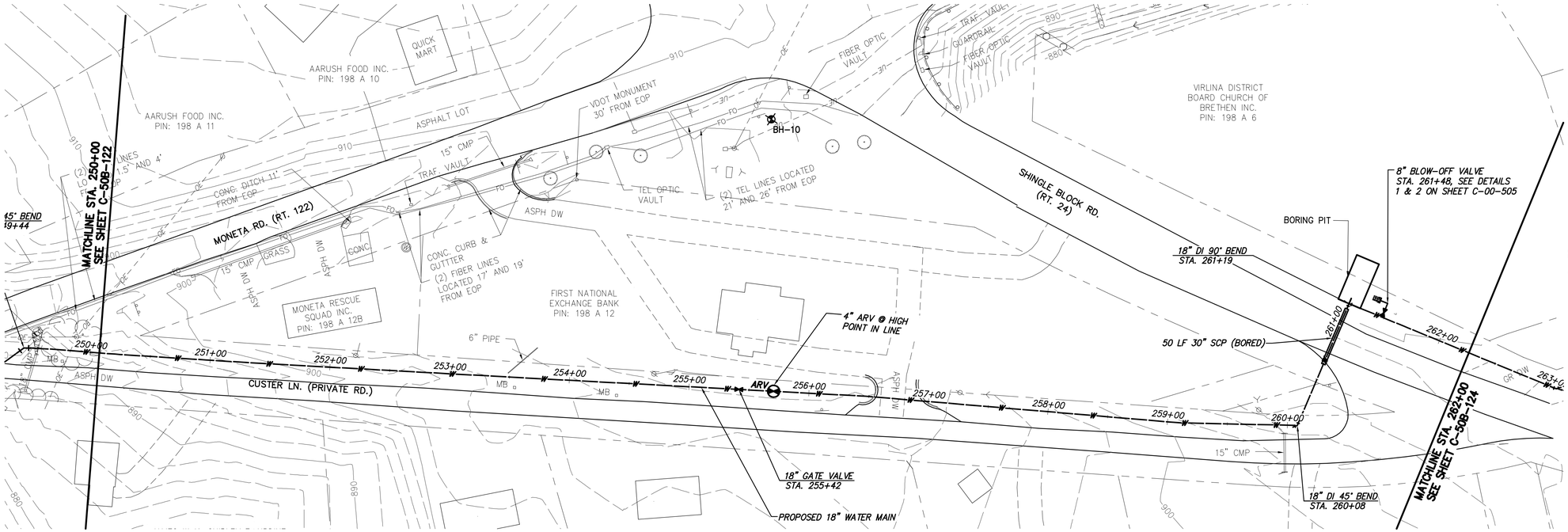
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

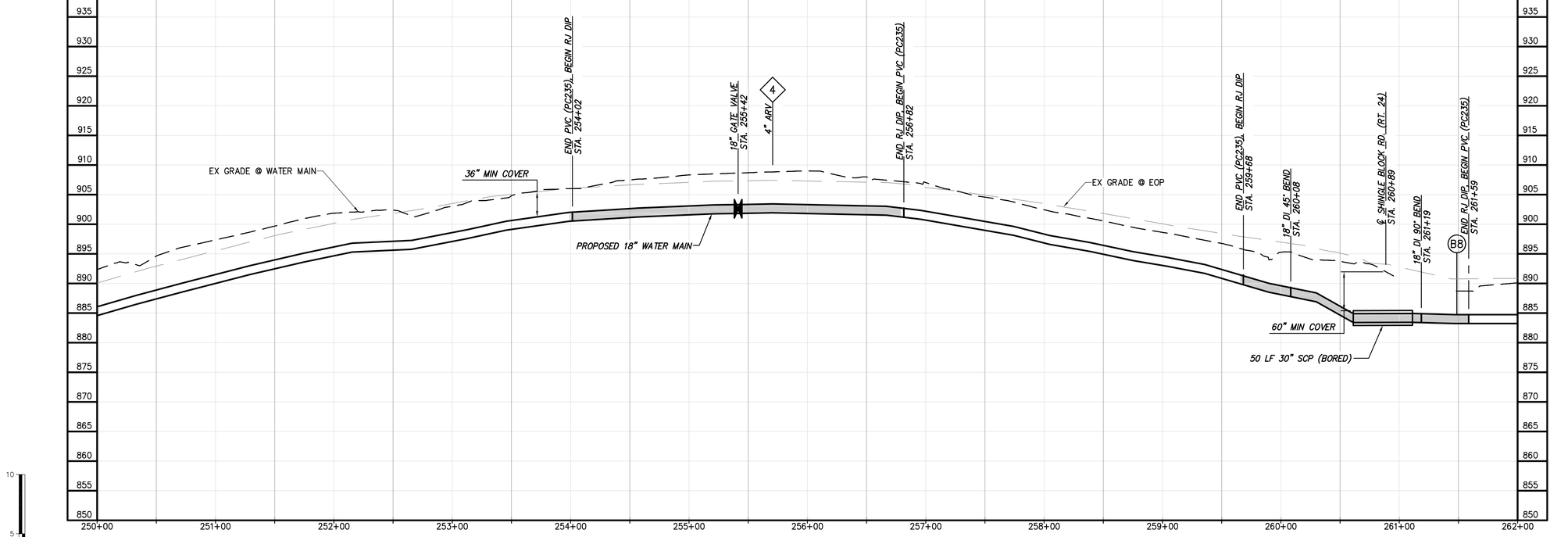
C-50B-122
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-122-126_27872.DWG
Saved: 6/4/2015 10:23:24 AM Plotted: 6/4/2015 11:57:24 AM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

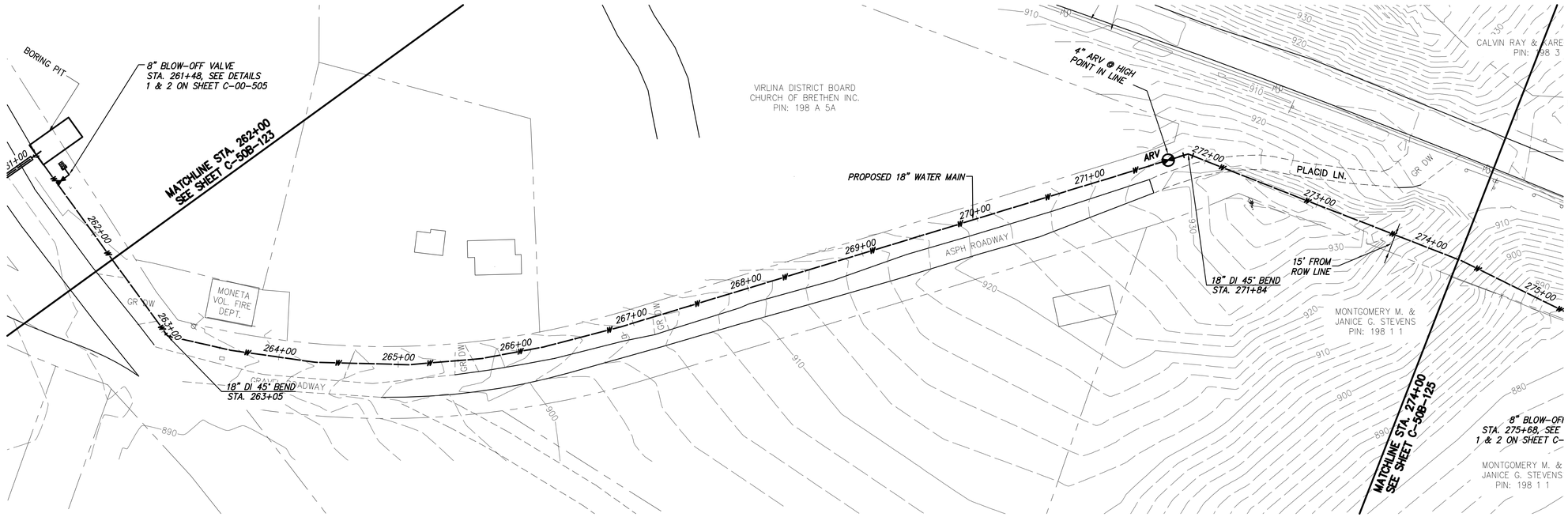
DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

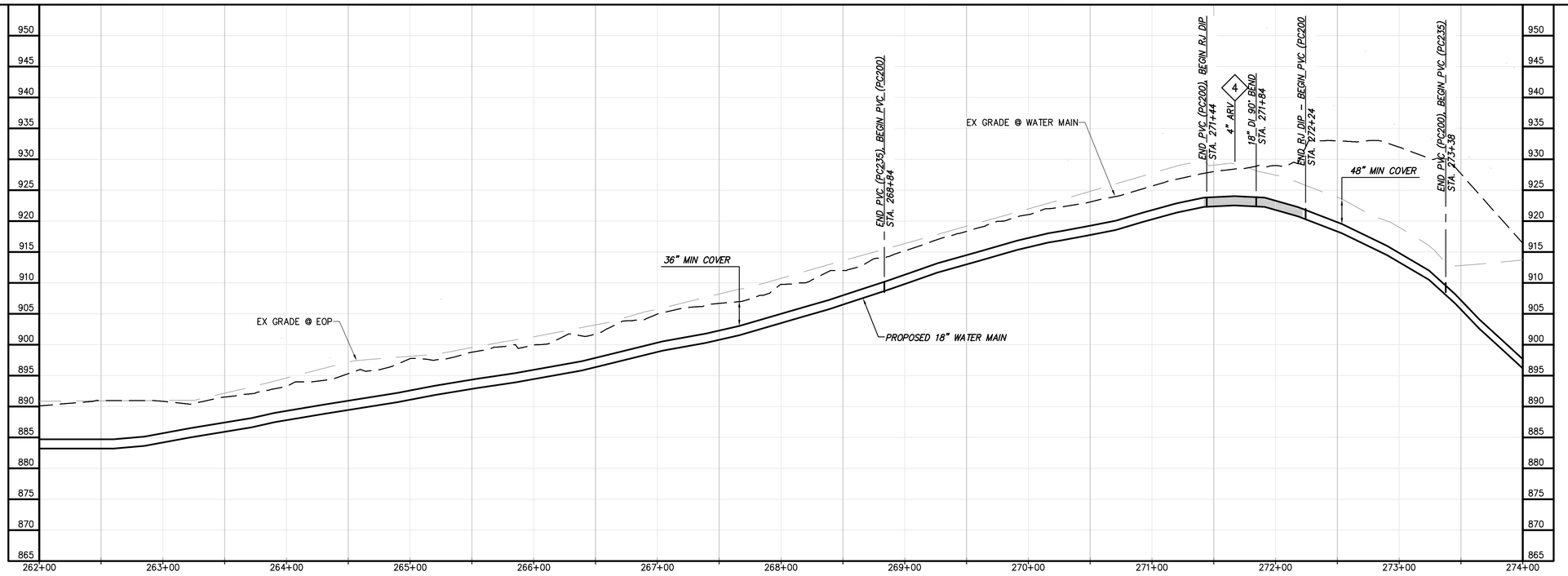
PROJECT NO.
27872

C-50B-123
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-122-126_27872.DWG
Saved: 6/4/2015 10:23:24 AM Plotted: 6/4/2015 11:58:04 AM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP

DATE	REVISIONS AND RECORD OF ISSUE
6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

0 50 100
Scale in feet

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

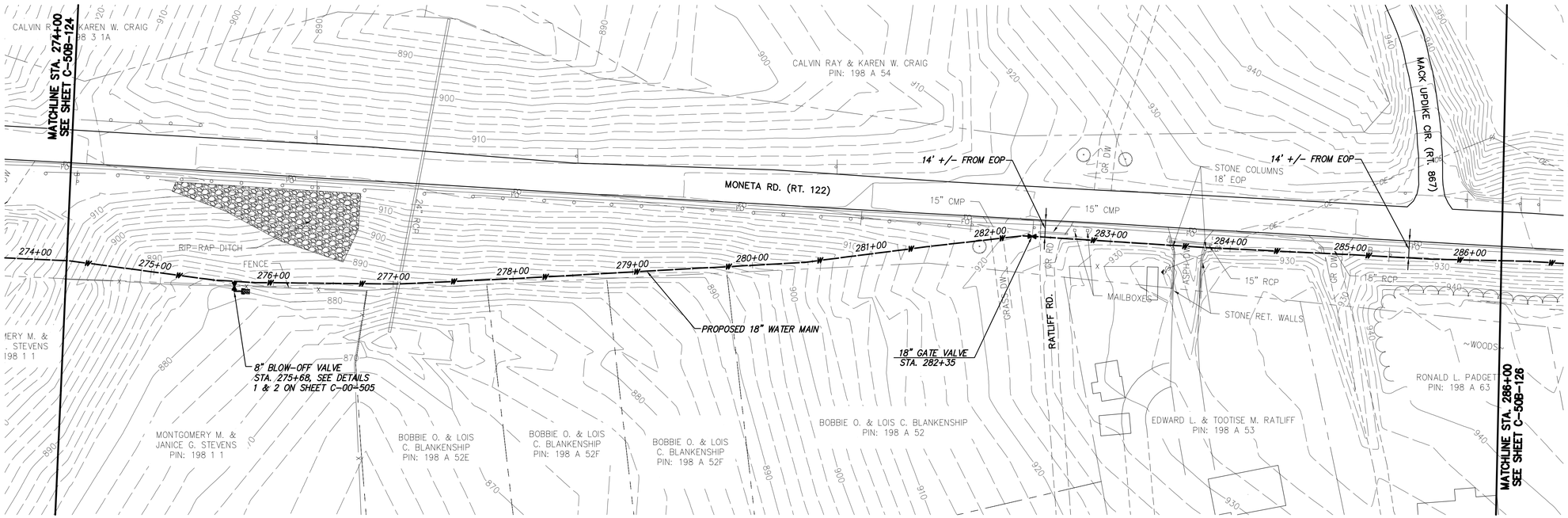
C-50B-124
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

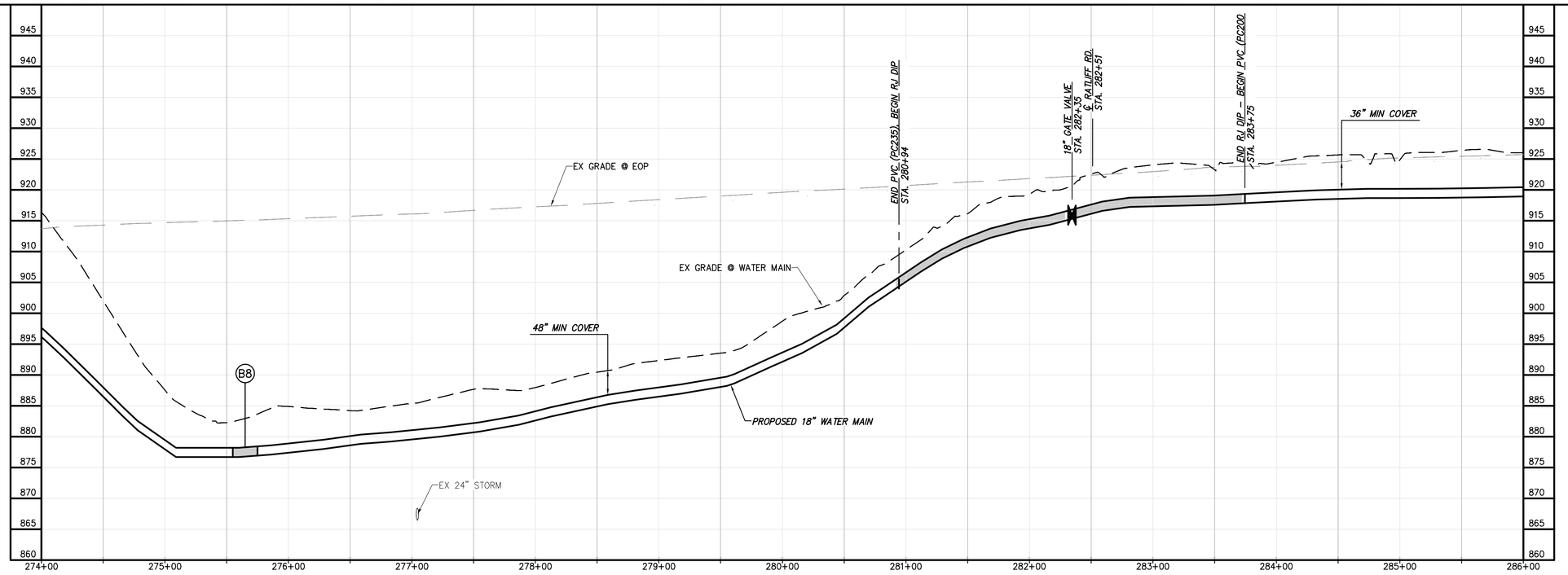
10 5 0
0 50 100
Scale in feet

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-122--126_27872.DWG
Saved: 6/4/2015 10:23:24 AM Plotted: 6/4/2015 11:58:44 AM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

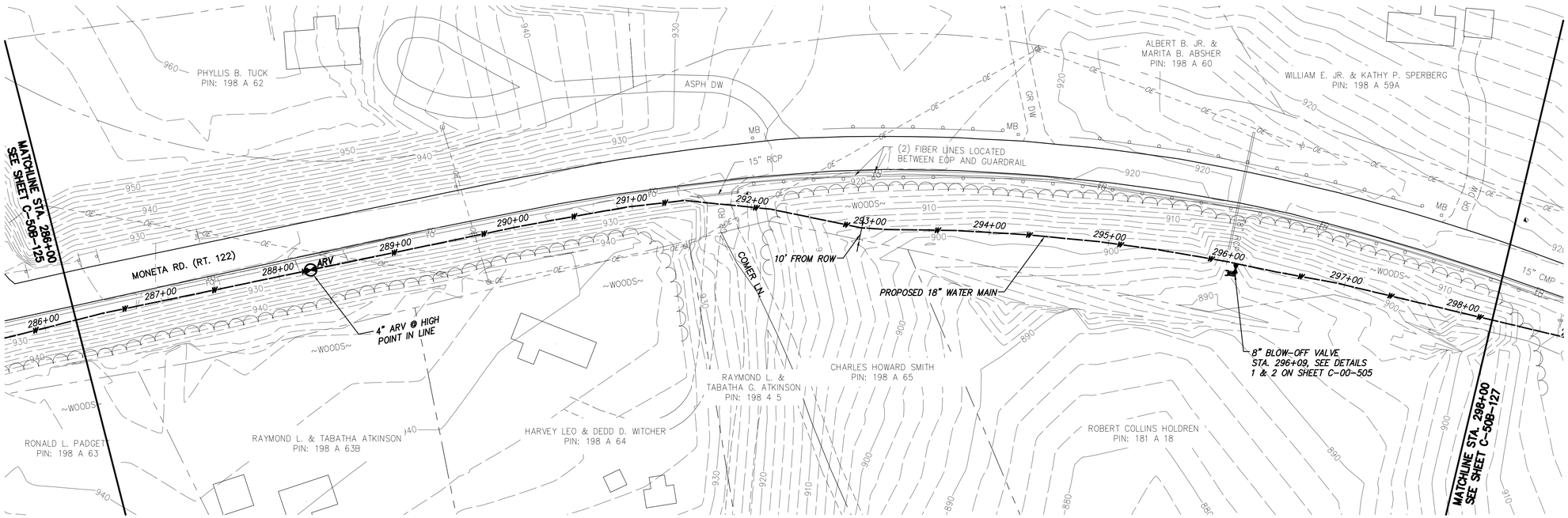
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

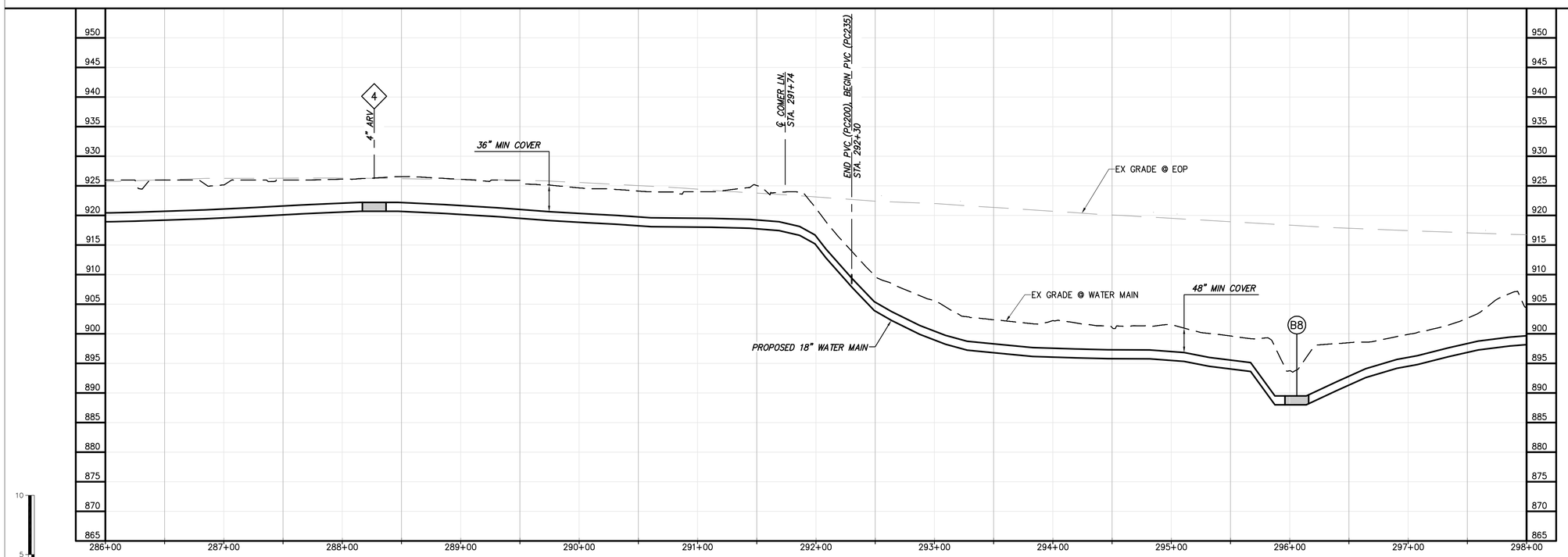
C-50B-125
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-122-126_27872.DWG
Saved: 6/4/2015 10:23:24 AM Plotted: 6/4/2015 11:59:29 AM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
DATE	REVISIONS AND RECORD OF ISSUE		
6/26/14	FINAL GMP SUBMITTAL TO OWNER		

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

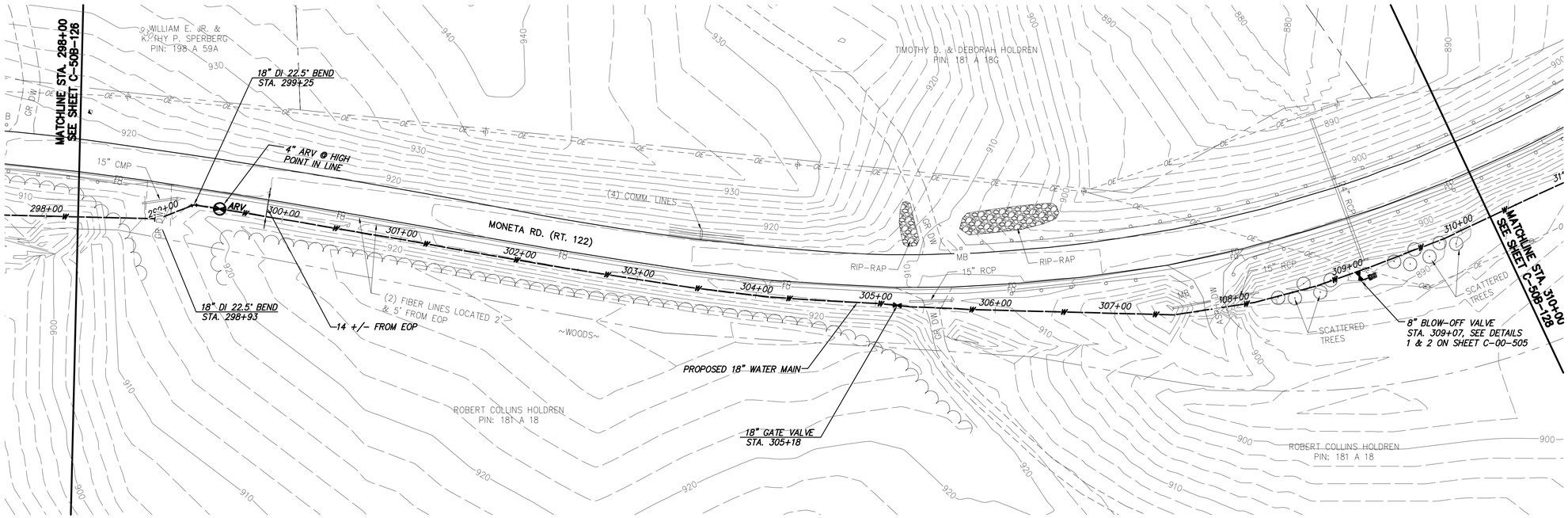
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50B-126
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-122-126_27872.DWG
Saved: 6/4/2015 10:23:24 AM Plotted: 6/4/2015 12:00:10 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



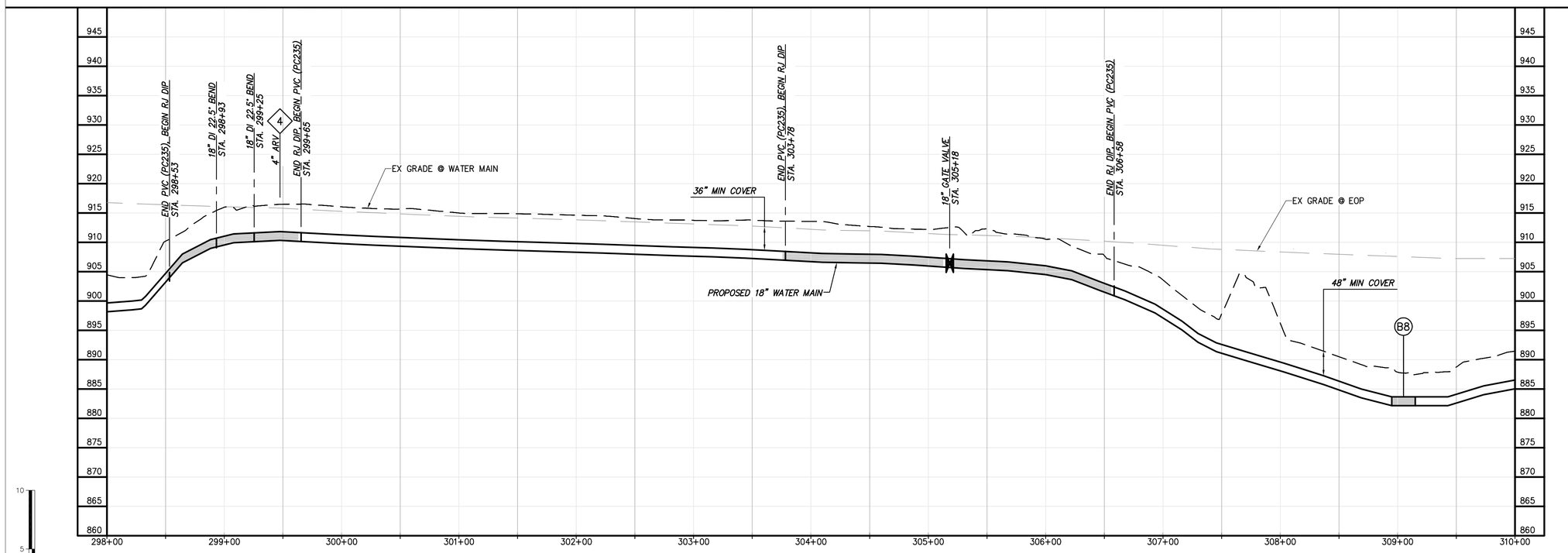
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

WATER MAIN PLAN



WATER MAIN PROFILE

10
5
0
0
50
100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

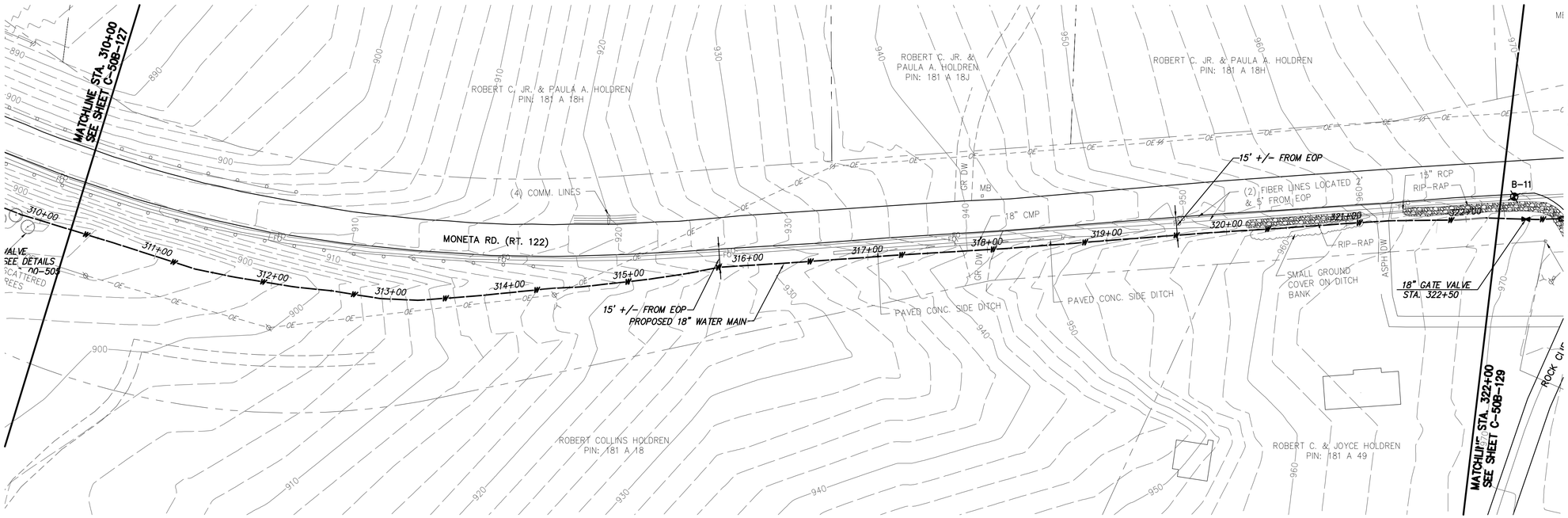
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

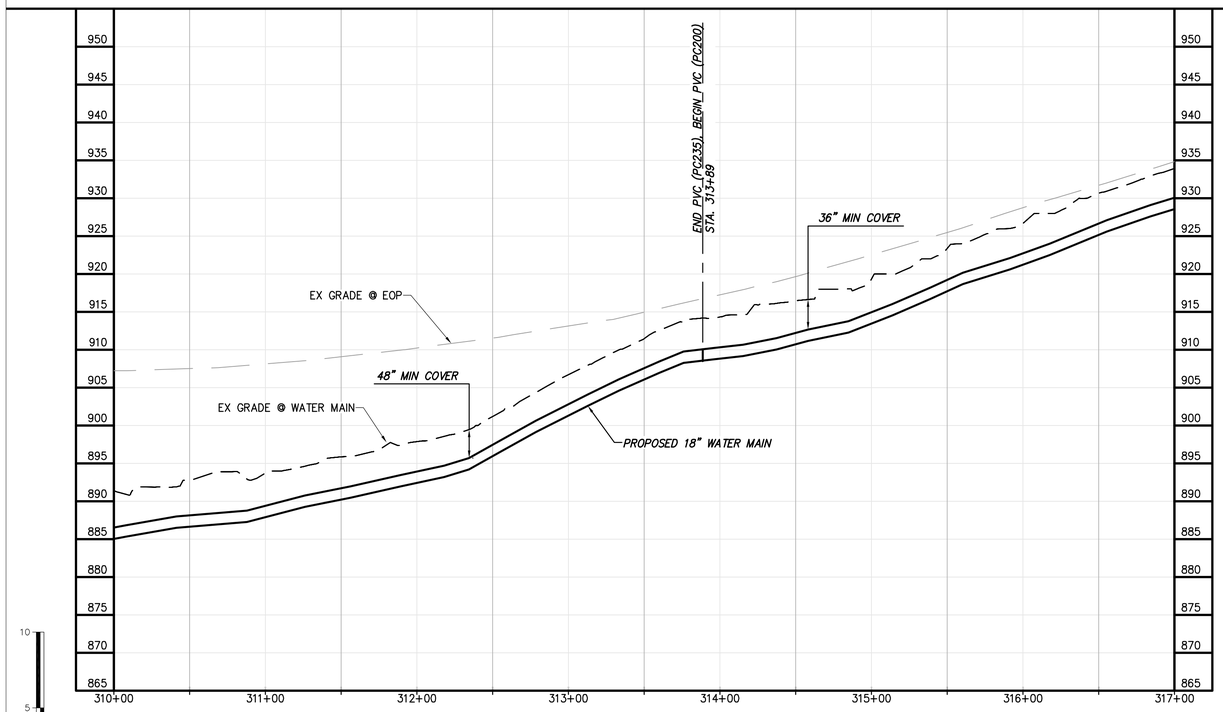
PROJECT NO.
27872

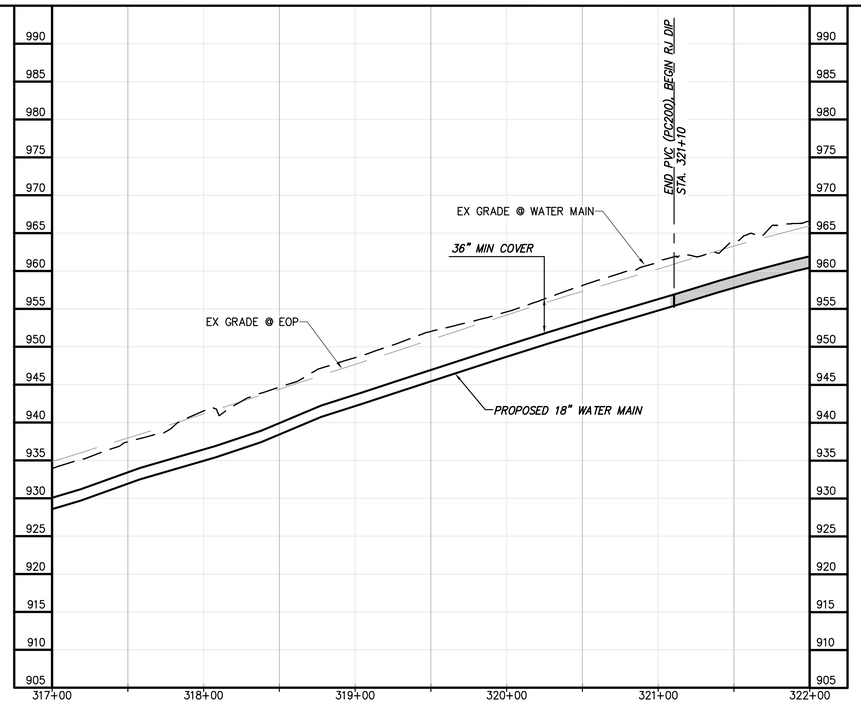
C-50B-127
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-127-131_27872.DWG
Saved: 6/4/2015 10:24:01 AM Plotted: 6/4/2015 12:02:35 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN





WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP
DATE	REVISIONS AND RECORD OF ISSUE		
6/25/14	FINAL GMP SUBMITTAL TO OWNER		

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

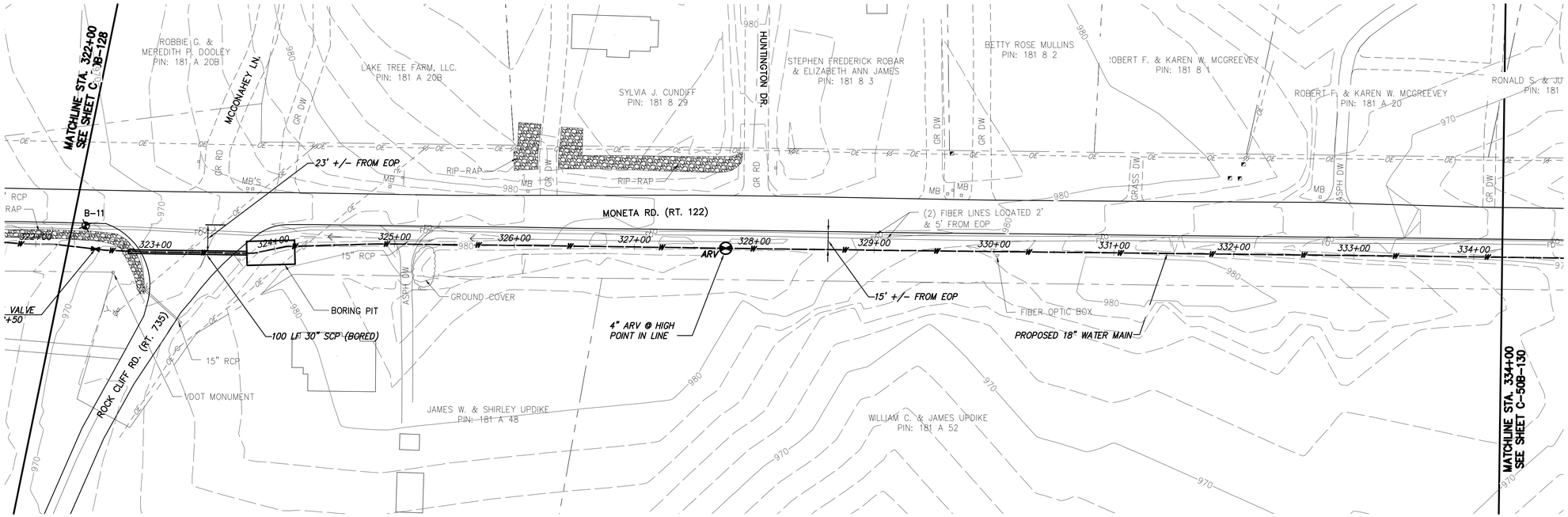
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

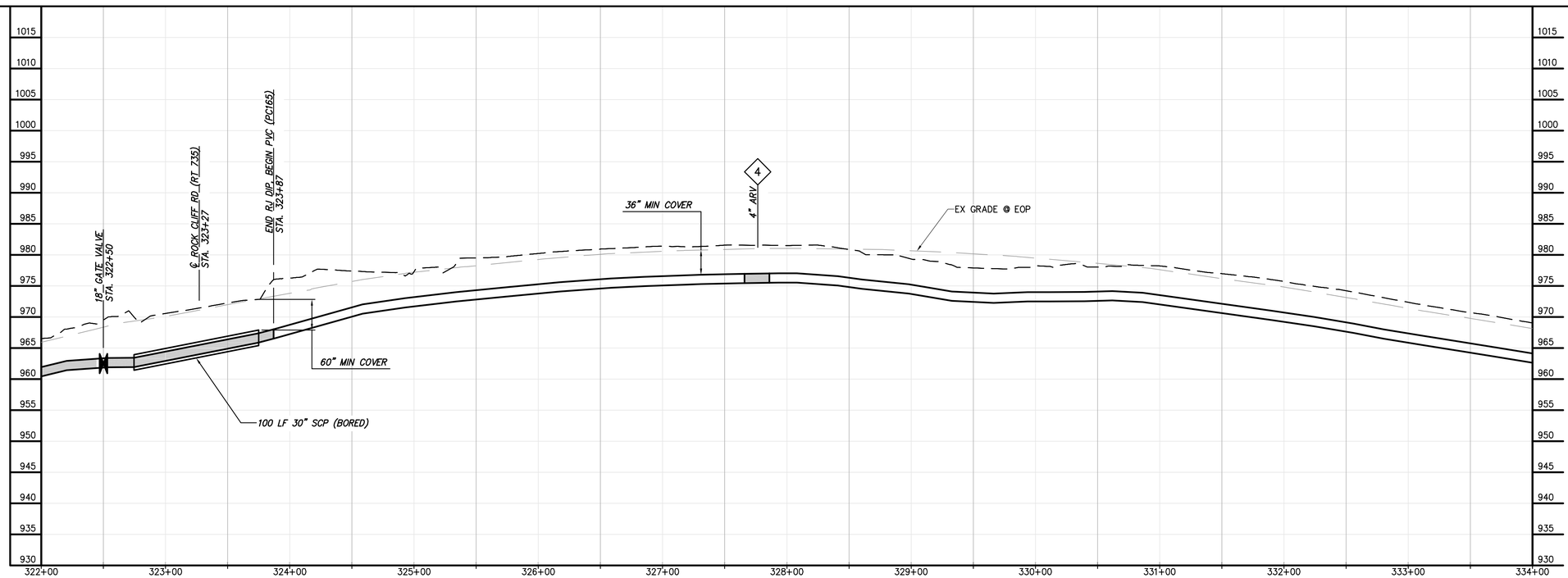
PROJECT NO.
27872

C-50B-128
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-127-131_27872.DWG
Saved: 6/4/2015 10:24:01 AM Plotted: 6/4/2015 12:03:29 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
6/25/14	FINAL GMP SUBMITTAL TO OWNER				

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

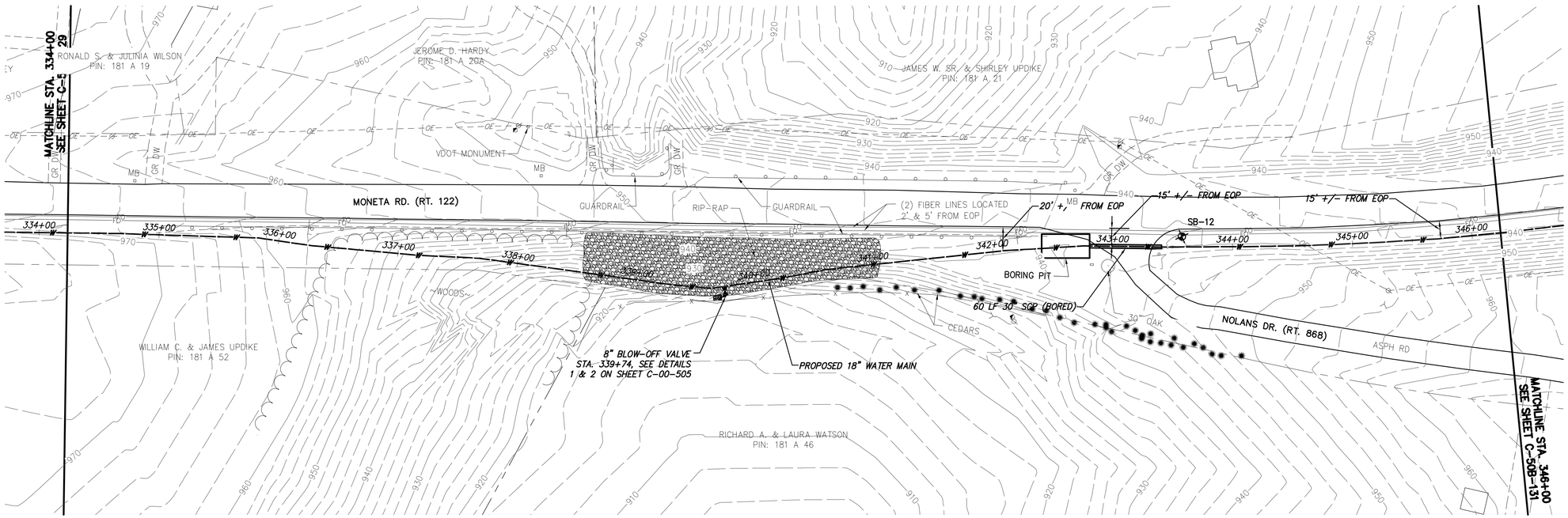
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

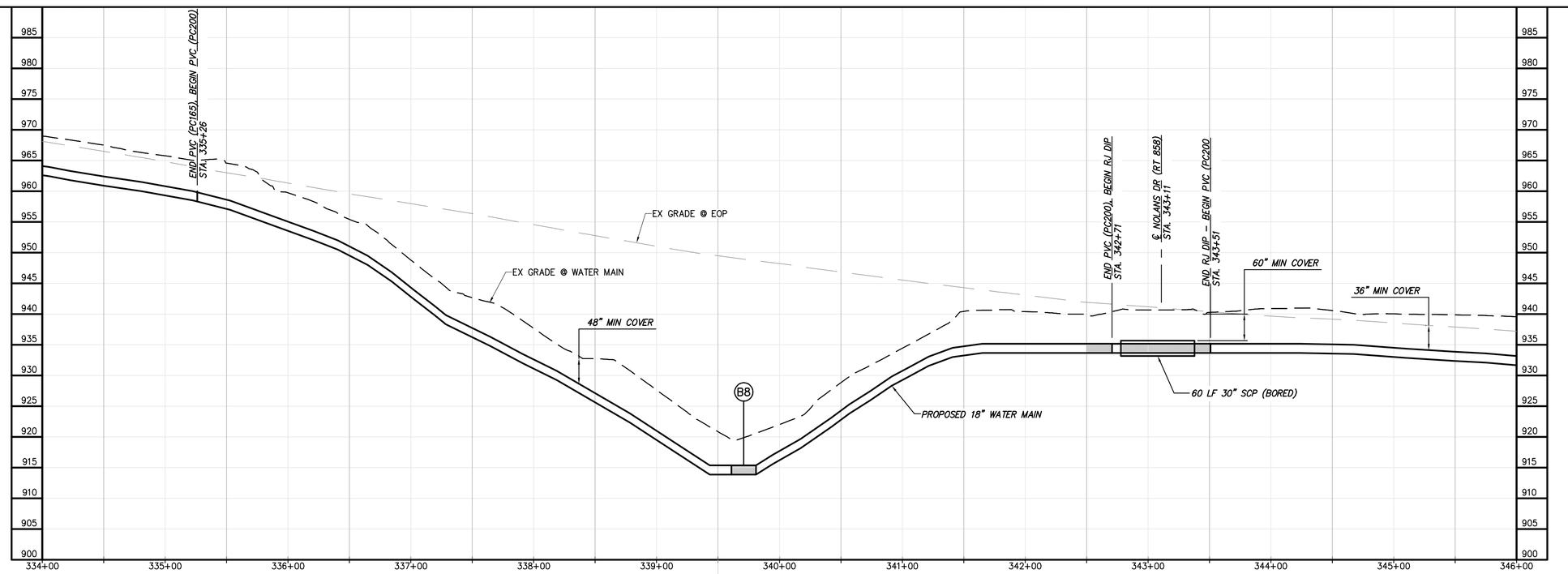
PROJECT NO.
27872

C-50B-129
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-127-131_27872.DWG
Saved: 6/4/2015 10:24:01 AM Plotted: 6/4/2015 12:04:11 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/25/14	FINAL GMP SUBMITTAL TO OWNER

SAVED: XREF1:
PLOTTED: XREF2:
USER: XREF3:
DWG VER: XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

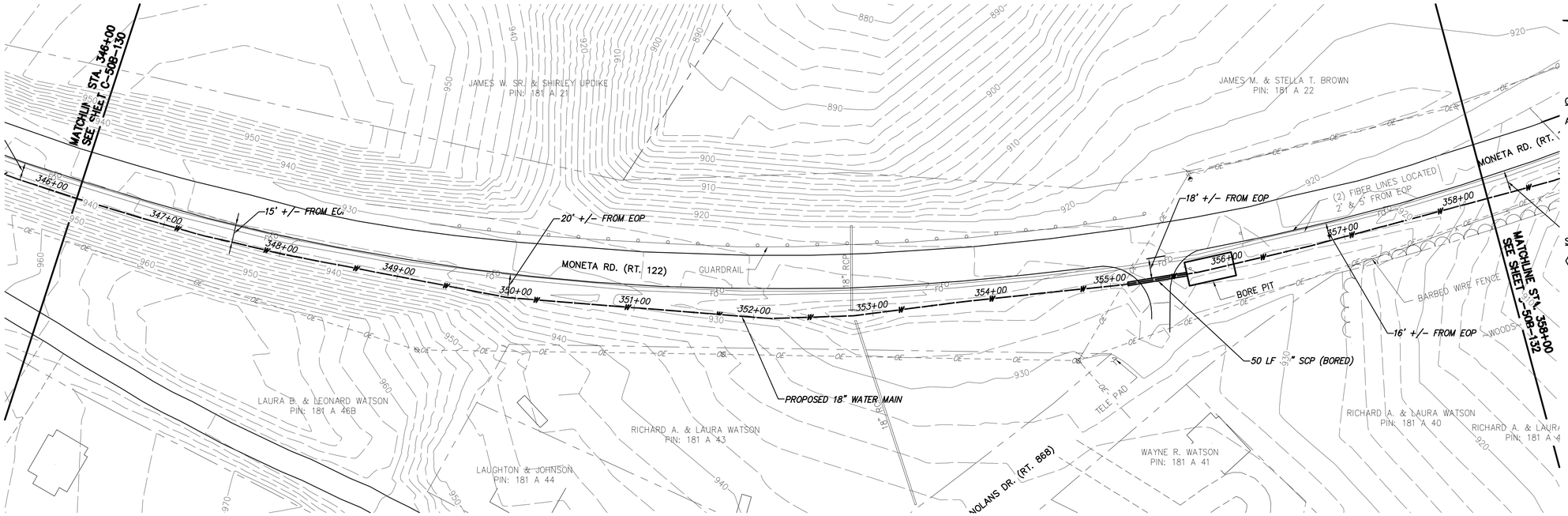
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

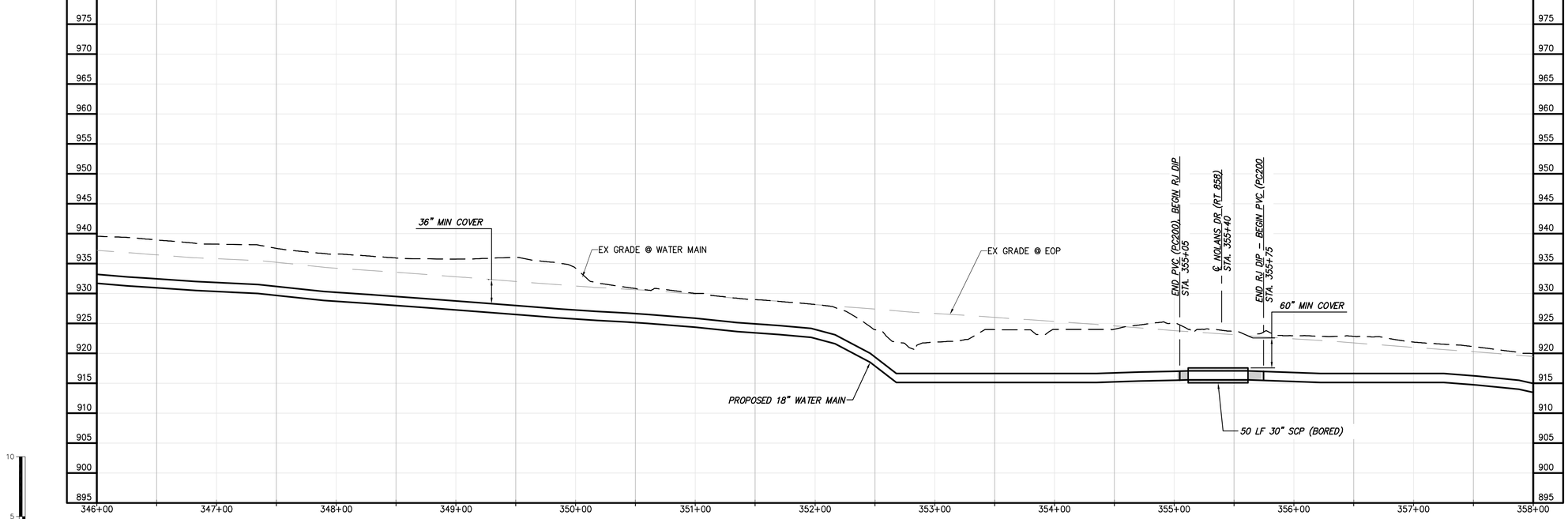
PROJECT NO.
27872

C-50B-130
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-127-131_27872.DWG
Saved: 6/4/2015 10:24:01 AM Plotted: 6/4/2015 12:04:51 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

0 5 10

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/26/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

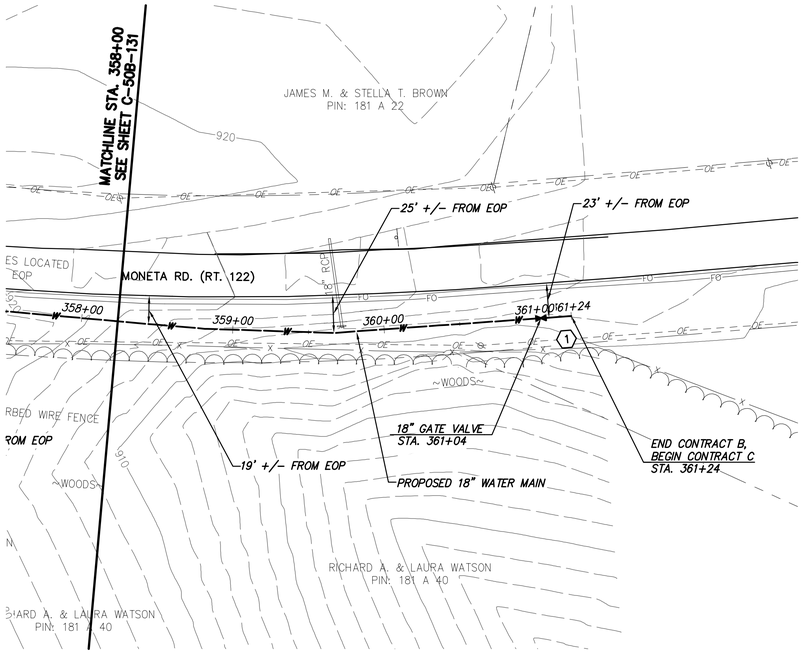
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

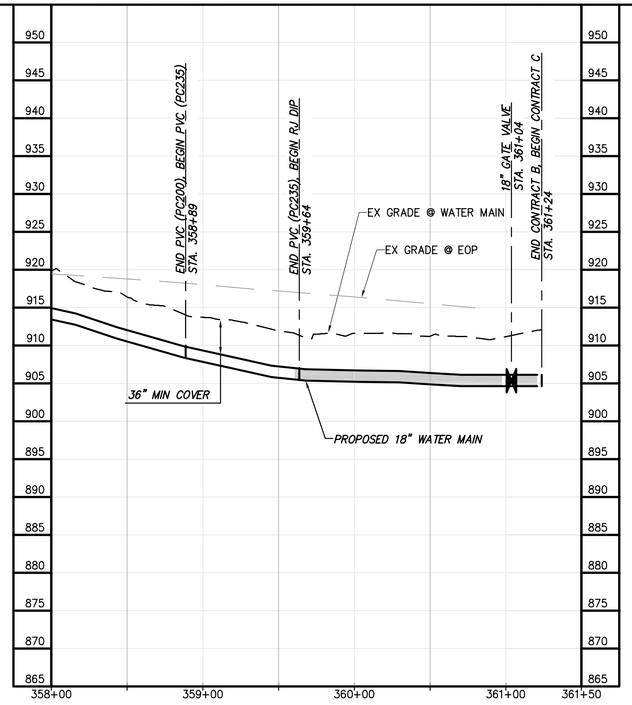
C-50B-131
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

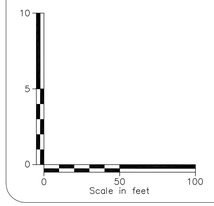
File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-127-131_27872.DWG
Saved: 6/4/2015 10:24:01 AM Plotted: 6/4/2015 12:05:34 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000

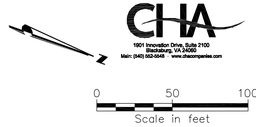


WATER MAIN PLAN



WATER MAIN PROFILE





CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COORDINATE TIE-IN AND TESTING WITH CONTRACTOR FOR CONTRACT C.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
				6/25/14	FINAL GMP SUBMITTAL TO OWNER

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE TO FOREST WATER MAIN EXTENSION PROJECT - CONTRACT B

CONTRACT B WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

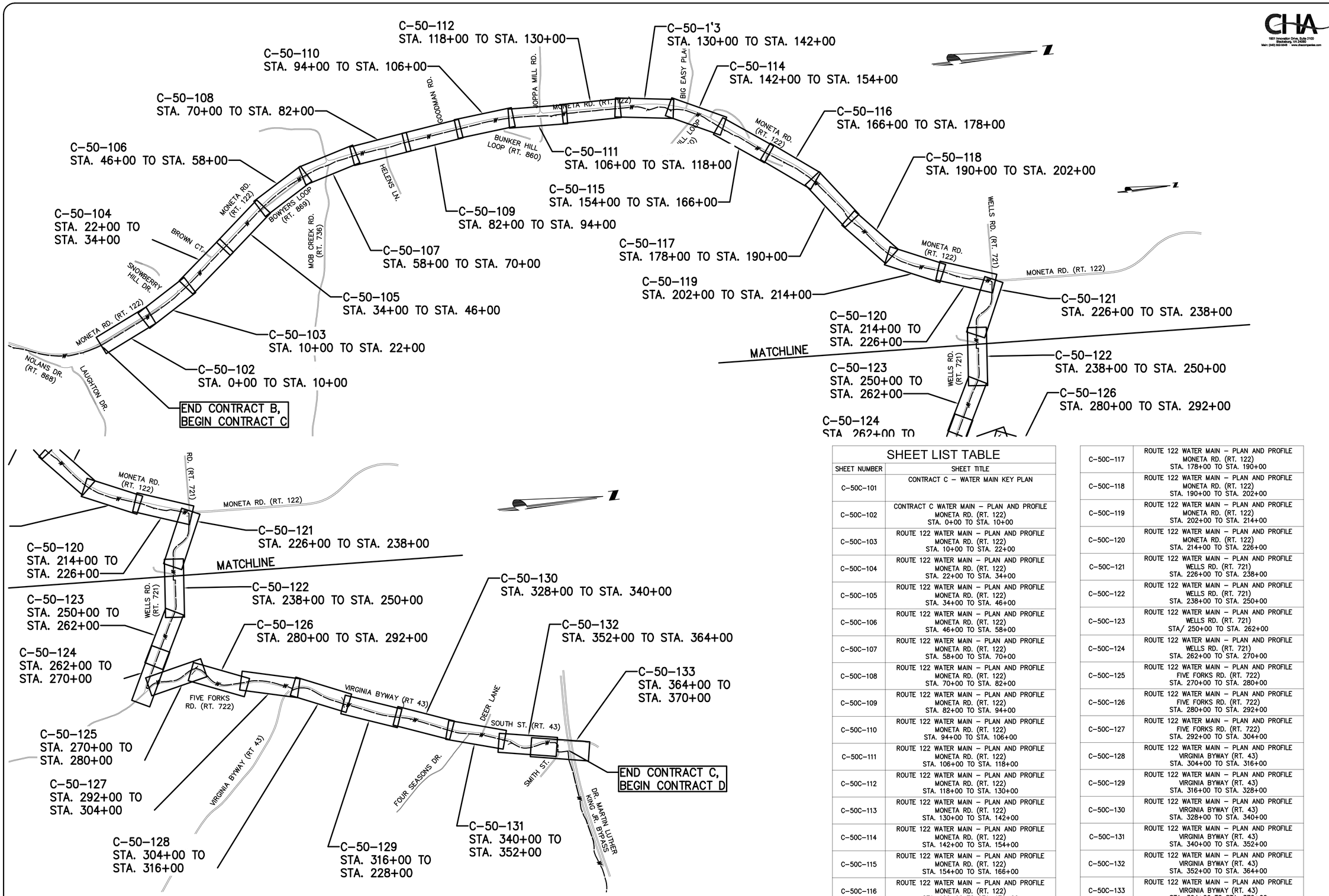
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50B-132
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50B-132_27872.DWG
Saved: 6/4/2015 10:24:08 AM Plotted: 6/4/2015 12:07:53 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C–50C–101	CONTRACT C – WATER MAIN KEY PLAN
C–50C–102	CONTRACT C WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 0+00 TO STA. 10+00
C–50C–103	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 10+00 TO STA. 22+00
C–50C–104	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 22+00 TO STA. 34+00
C–50C–105	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 34+00 TO STA. 46+00
C–50C–106	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 46+00 TO STA. 58+00
C–50C–107	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 58+00 TO STA. 70+00
C–50C–108	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 70+00 TO STA. 82+00
C–50C–109	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 82+00 TO STA. 94+00
C–50C–110	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 94+00 TO STA. 106+00
C–50C–111	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 106+00 TO STA. 118+00
C–50C–112	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 118+00 TO STA. 130+00
C–50C–113	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 130+00 TO STA. 142+00
C–50C–114	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 142+00 TO STA. 154+00
C–50C–115	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 154+00 TO STA. 166+00
C–50C–116	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 166+00 TO STA. 178+00
C–50C–117	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 178+00 TO STA. 190+00
C–50C–118	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 190+00 TO STA. 202+00
C–50C–119	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 202+00 TO STA. 214+00
C–50C–120	ROUTE 122 WATER MAIN – PLAN AND PROFILE MONETA RD. (RT. 122) STA. 214+00 TO STA. 226+00
C–50C–121	ROUTE 122 WATER MAIN – PLAN AND PROFILE WELLS RD. (RT. 721) STA. 226+00 TO STA. 238+00
C–50C–122	ROUTE 122 WATER MAIN – PLAN AND PROFILE WELLS RD. (RT. 721) STA. 238+00 TO STA. 250+00
C–50C–123	ROUTE 122 WATER MAIN – PLAN AND PROFILE WELLS RD. (RT. 721) STA/ 250+00 TO STA. 262+00
C–50C–124	ROUTE 122 WATER MAIN – PLAN AND PROFILE WELLS RD. (RT. 721) STA. 262+00 TO STA. 270+00
C–50C–125	ROUTE 122 WATER MAIN – PLAN AND PROFILE FIVE FORKS RD. (RT. 722) STA. 270+00 TO STA. 280+00
C–50C–126	ROUTE 122 WATER MAIN – PLAN AND PROFILE FIVE FORKS RD. (RT. 722) STA. 280+00 TO STA. 292+00
C–50C–127	ROUTE 122 WATER MAIN – PLAN AND PROFILE FIVE FORKS RD. (RT. 722) STA. 292+00 TO STA. 304+00
C–50C–128	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 304+00 TO STA. 316+00
C–50C–129	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 316+00 TO STA. 328+00
C–50C–130	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 328+00 TO STA. 340+00
C–50C–131	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 340+00 TO STA. 352+00
C–50C–132	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 352+00 TO STA. 364+00
C–50C–133	ROUTE 122 WATER MAIN – PLAN AND PROFILE VIRGINIA BYWAY (RT. 43) STA. 364+00 TO STA. 370+00

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DRG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri
LEVEL 3 DESIGN DOCUMENTS

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C - WATER MAIN KEY PLAN

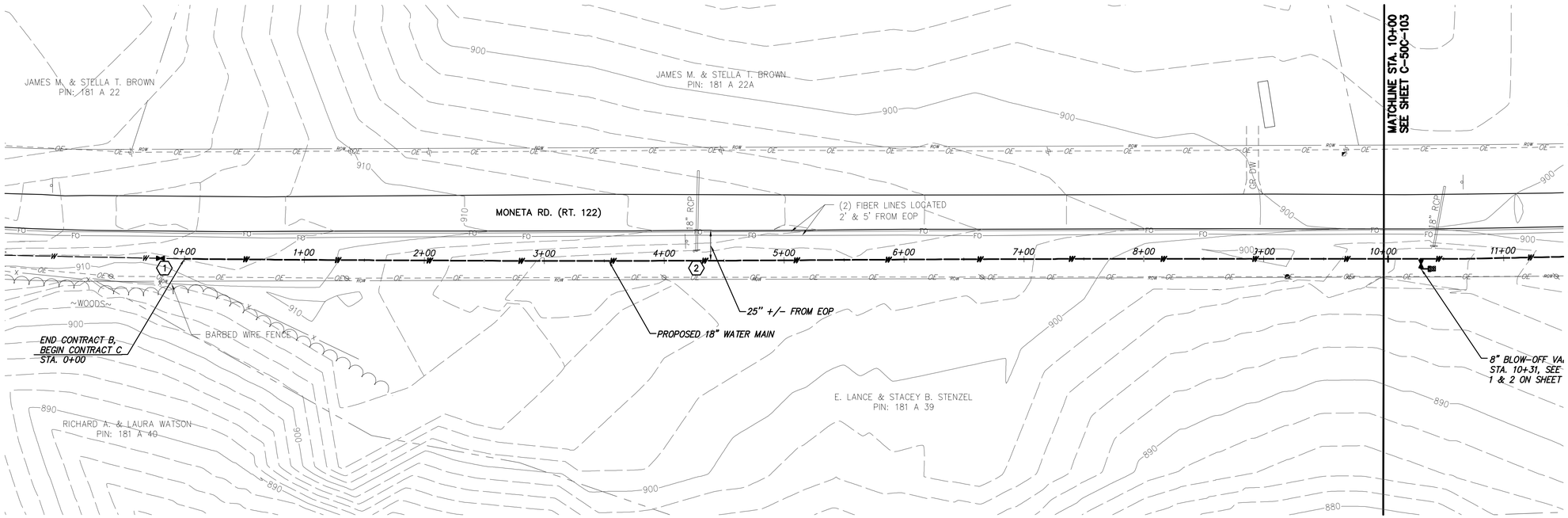
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE: 01-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-101

File: V:\PROJECTS\VN62\PROJ1\27872\CADD_ACAD\C-50C-101-27872.DWG
Saved: 6/4/2015 11:10:45 AM Plotted: 6/4/2015 12:15:51 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



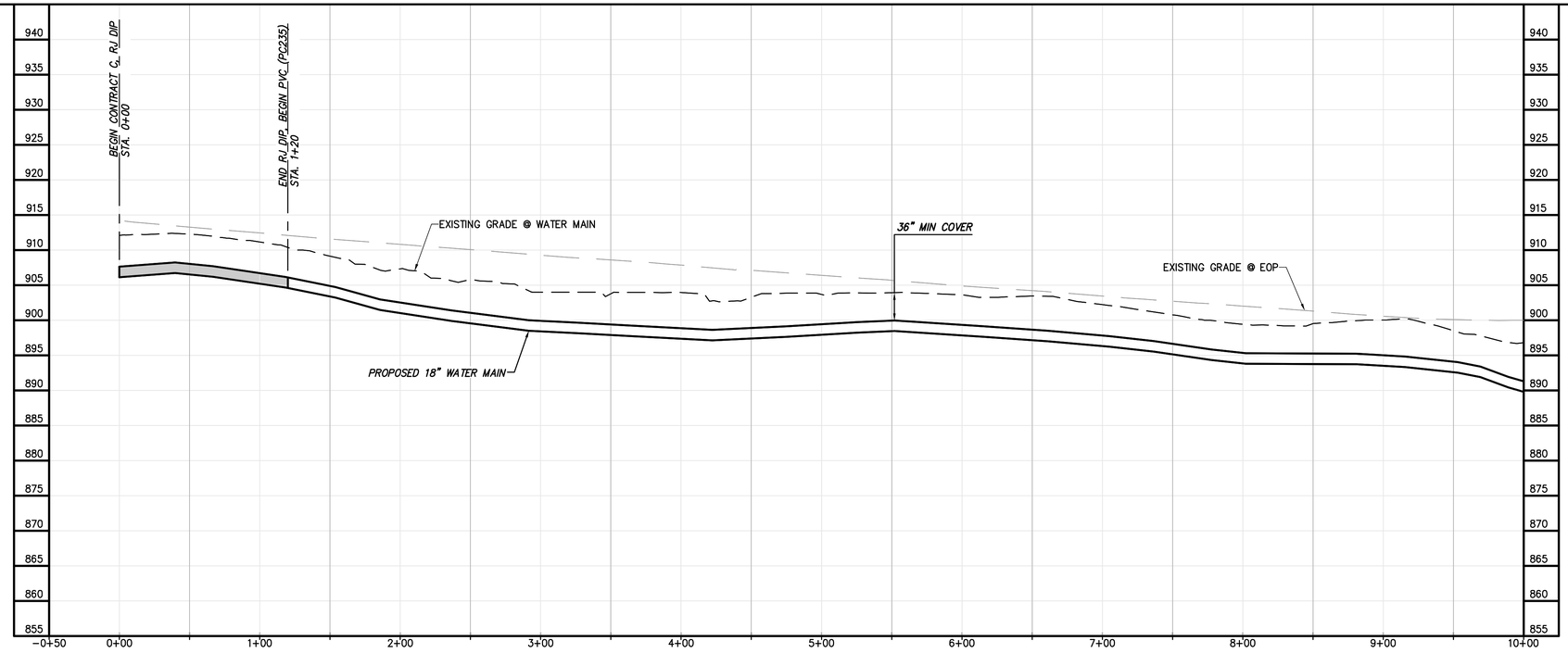
WATER MAIN PLAN

GENERAL NOTES:

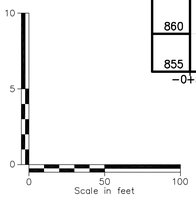
A.

SPECIFIC NOTES

1. COORDINATE TIE-IN AND TESTING WITH CONTRACTOR FOR CONTRACT B.
2. RIP RAP CULVERT DISCHARGE.



WATER MAIN PROFILE



PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

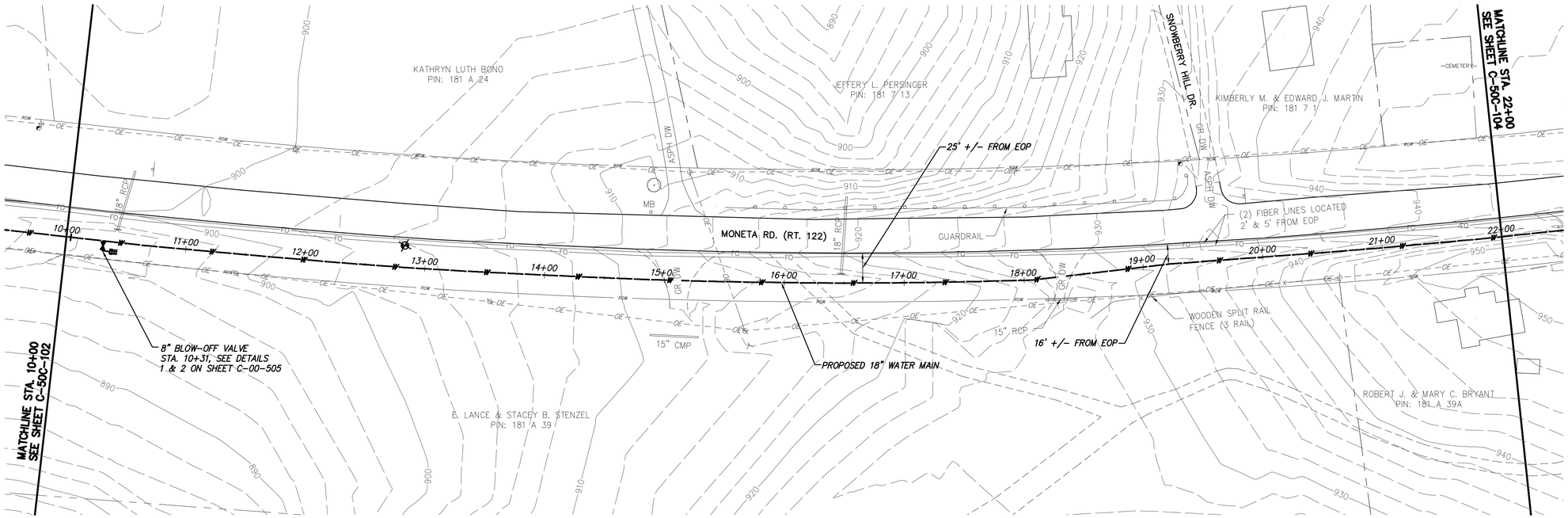
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

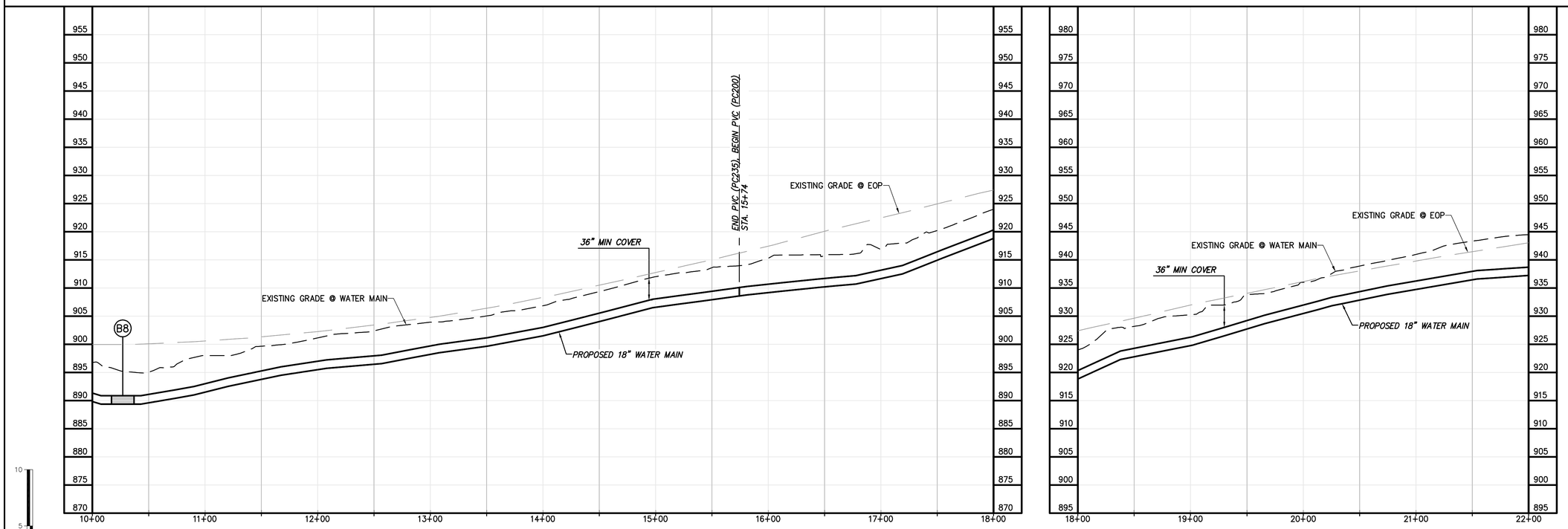
C-50C-102
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-102-107_27872.DWG
Saved: 6/4/2015 10:25:26 AM Plotted: 6/4/2015 12:19:02 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

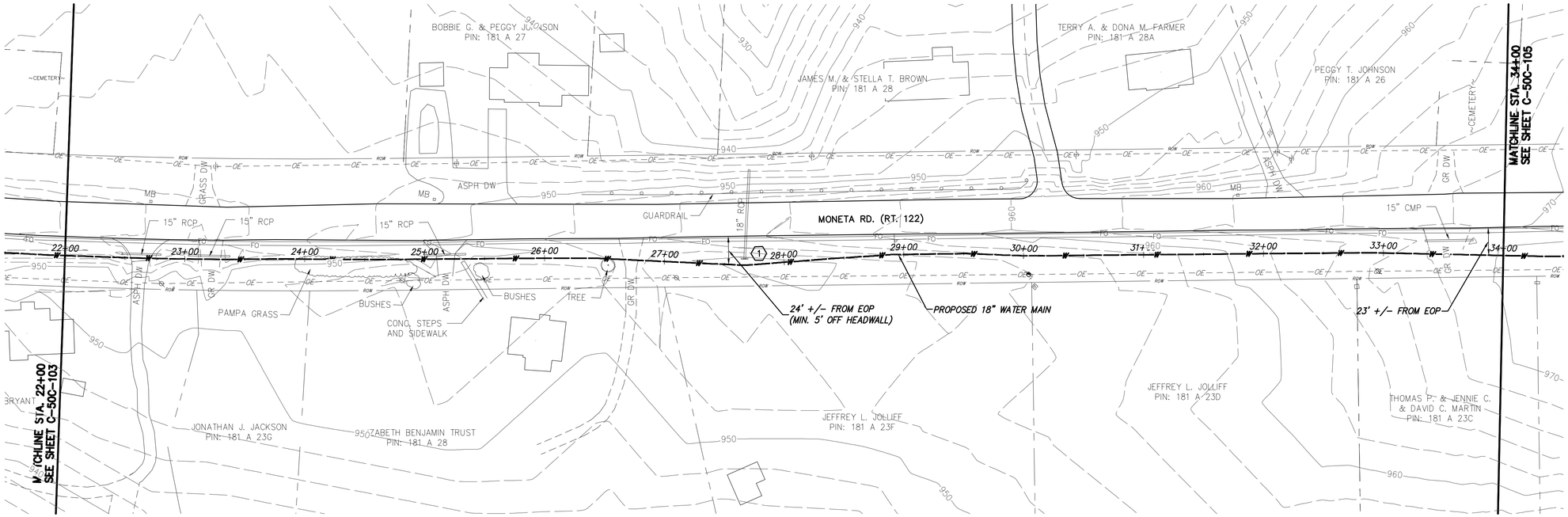
PROJECT NO.
27872

C-50C-103
SHEET
OF

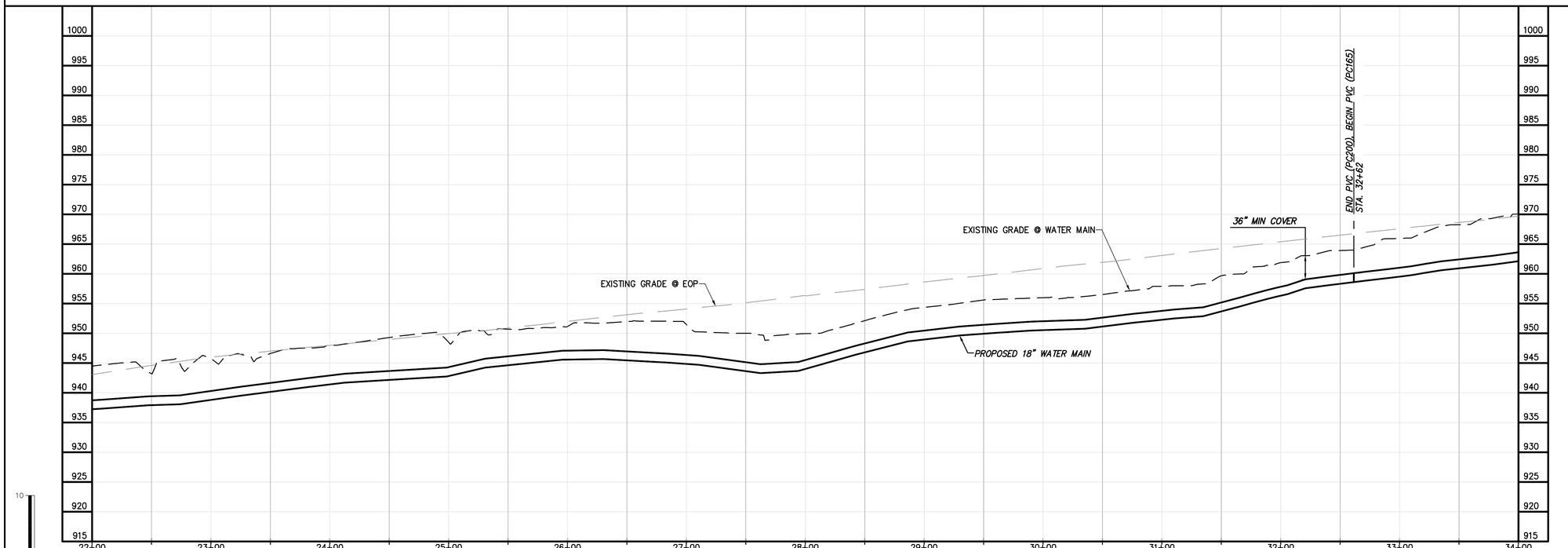
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-102-107_27872.DWG
Saved: 6/4/2015 10:25:26 AM Plotted: 6/4/2015 12:20:12 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) RIP RAP CULVERT DISCHARGE.

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

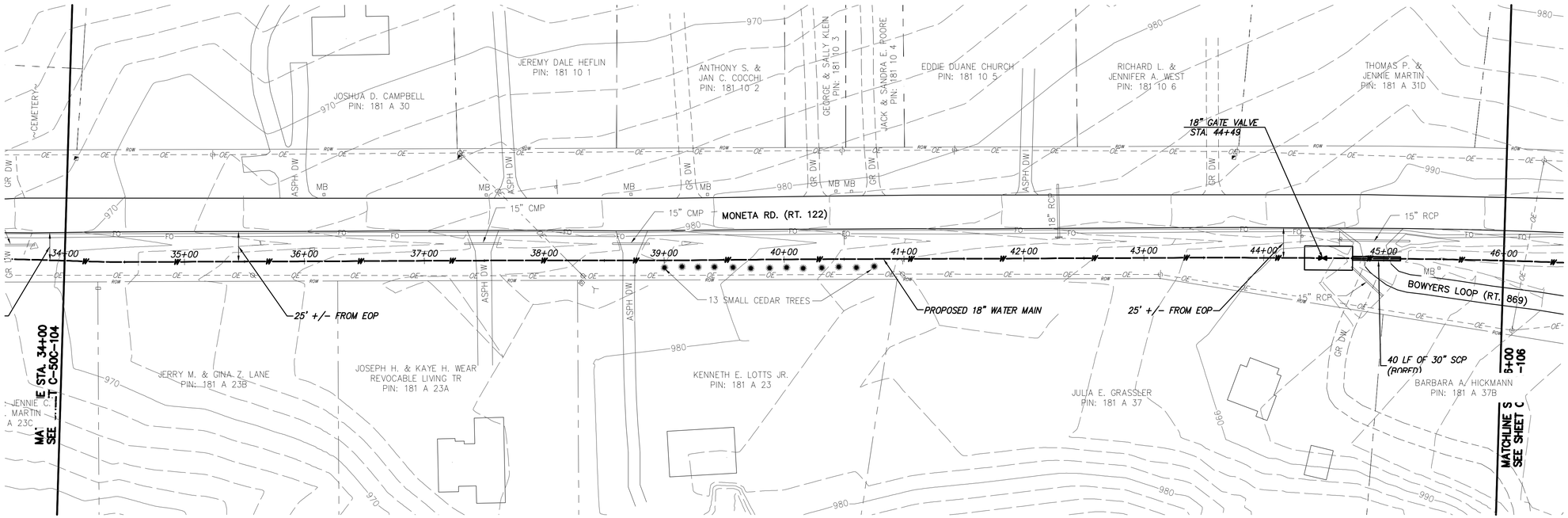
PROJECT NO.
27872

C-50C-104
SHEET
OF

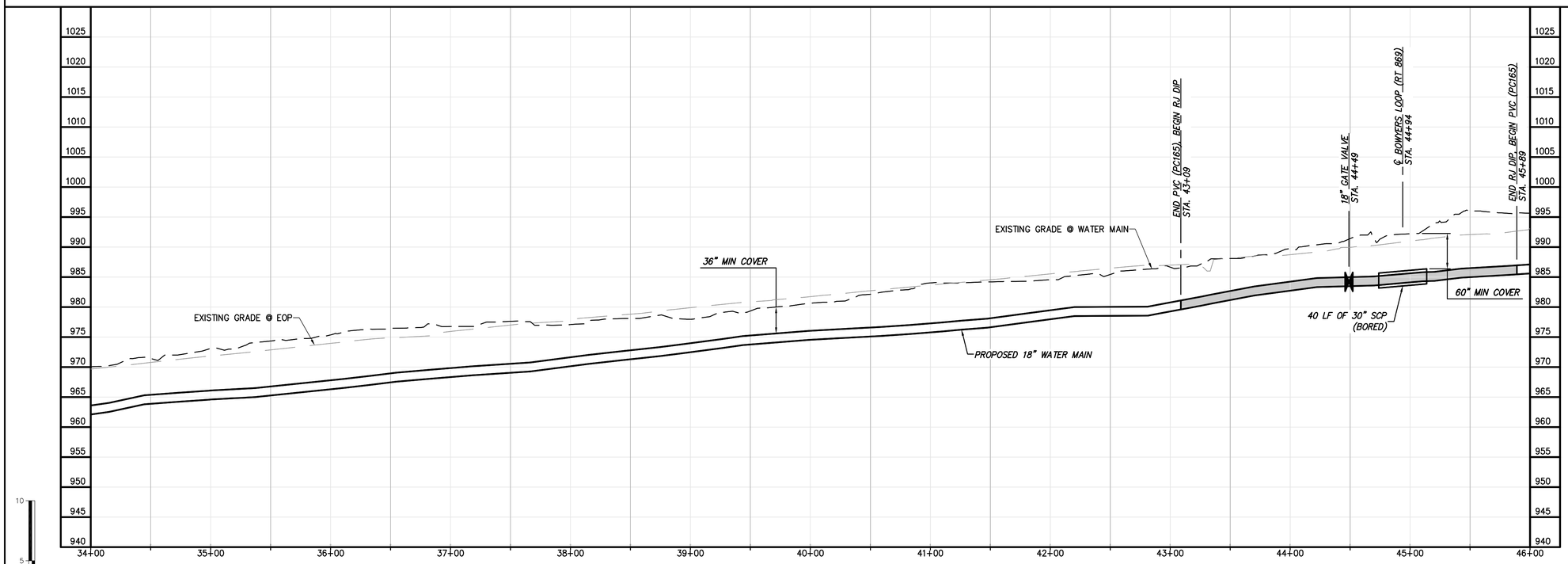
PRELIMINARY - NOT FOR CONSTRUCTION

FD7000
DT000

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-102-107_27872.DWG
Saved: 6/4/2015 10:25:26 AM Plotted: 6/4/2015 12:21:02 PM User: Miller, Gary LastSavedBy: 4646



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

0 50 100
Scale in feet

0 5 10
0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

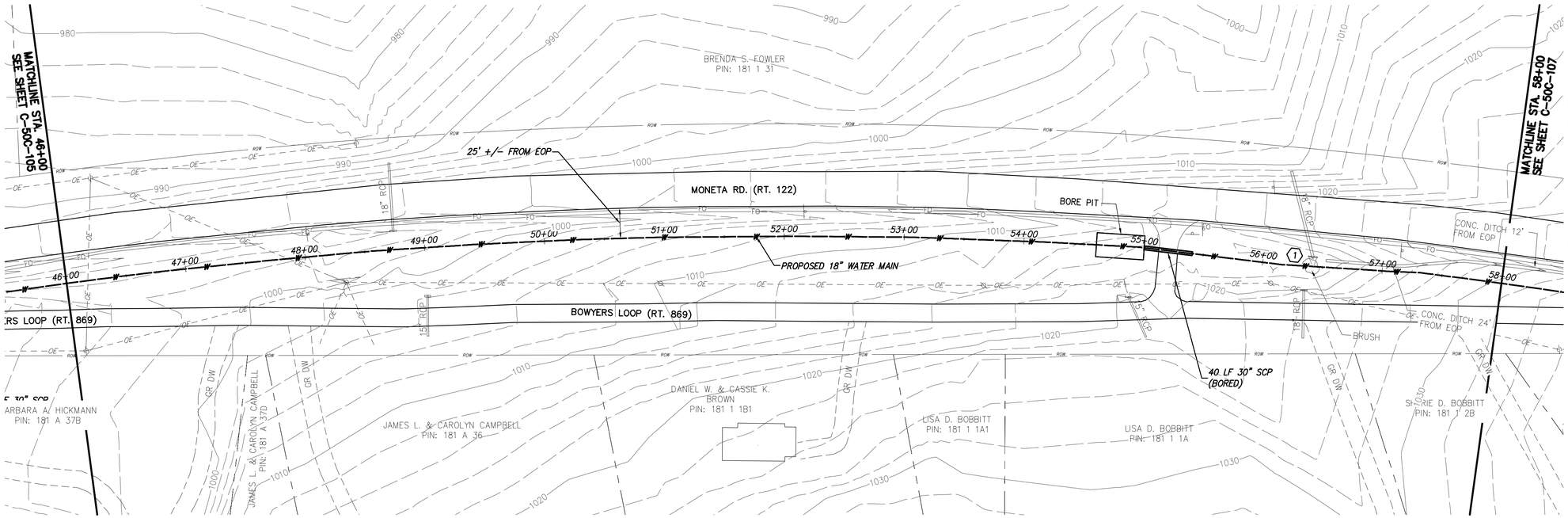
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

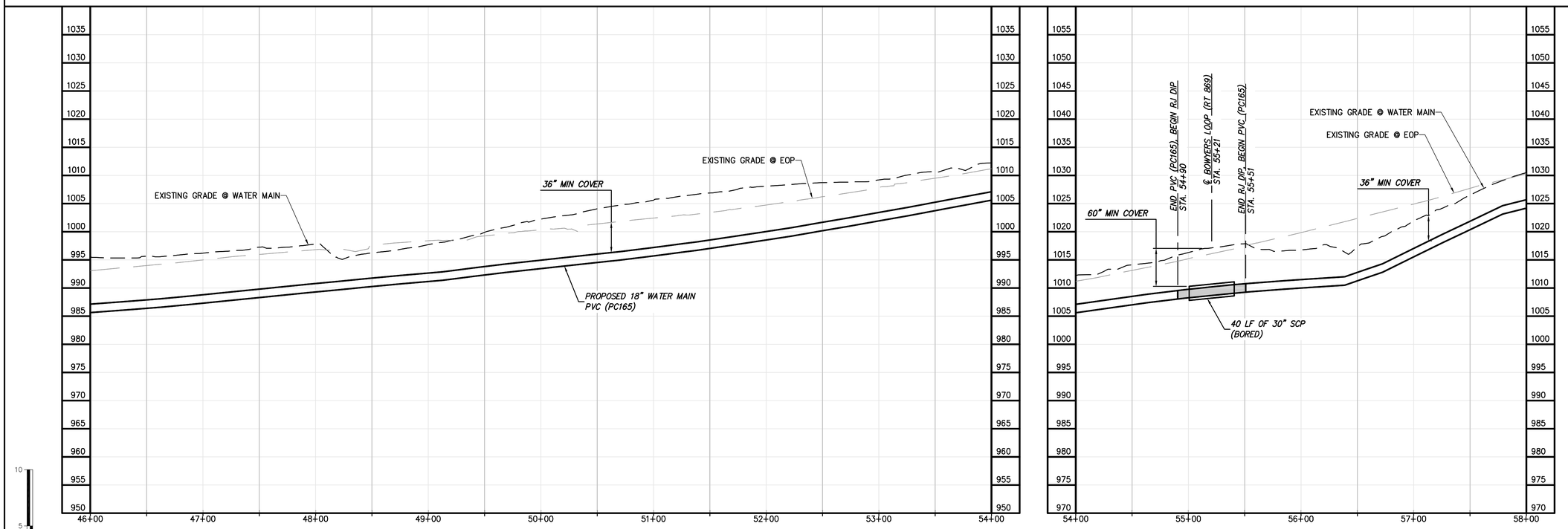
C-50C-105
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-102-107_27872.DWG
Saved: 6/4/2015 10:25:26 AM Plotted: 6/4/2015 12:21:51 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) RIP RAP CULVERT DISCHARGE.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

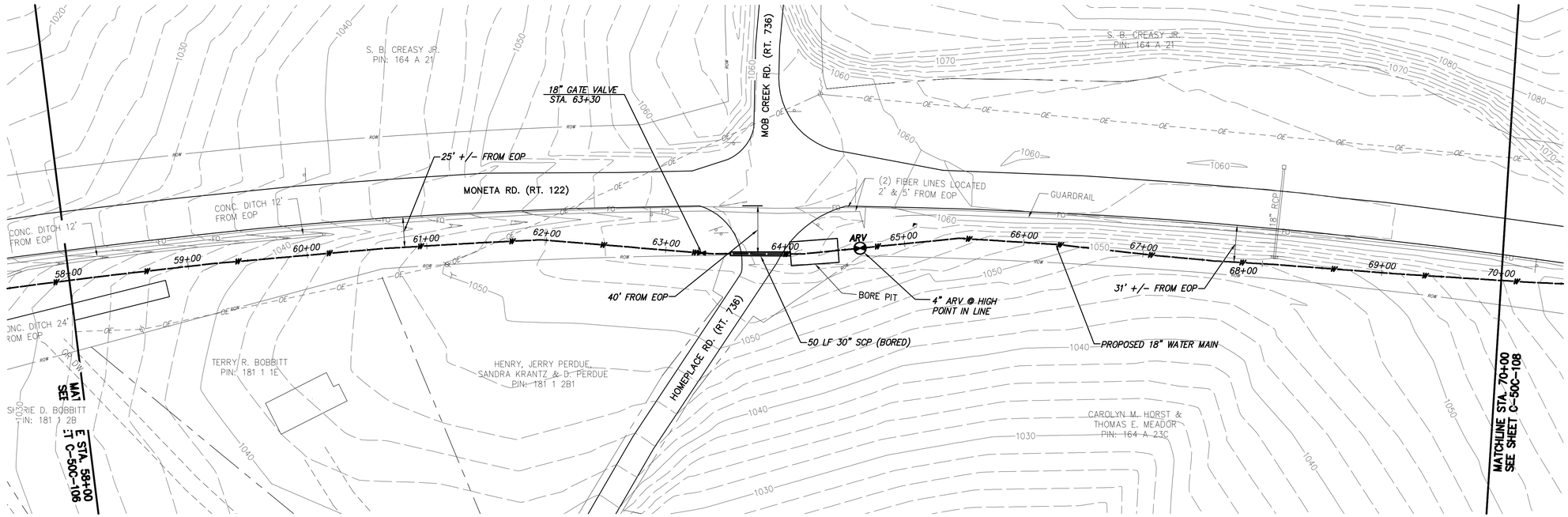
PROJECT NO.
27872

C-50C-106
SHEET
OF

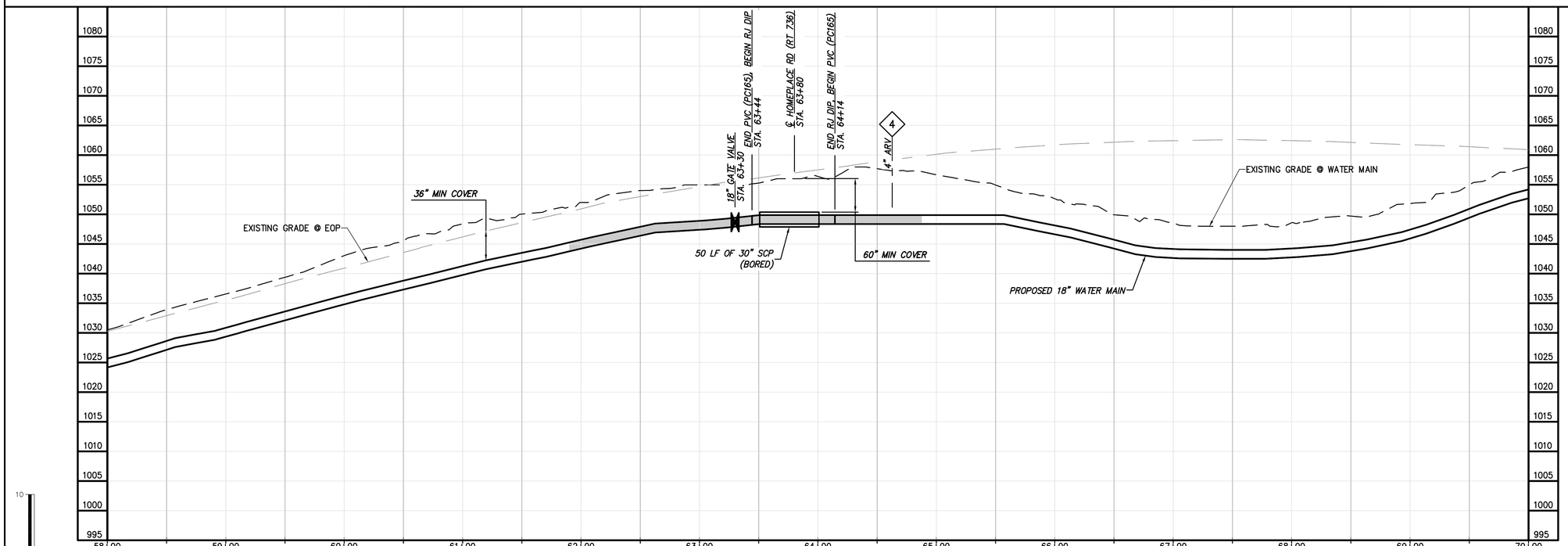
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-102-107_27872.DWG
Saved: 6/4/2015 10:25:26 AM Plotted: 6/4/2015 12:23:01 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

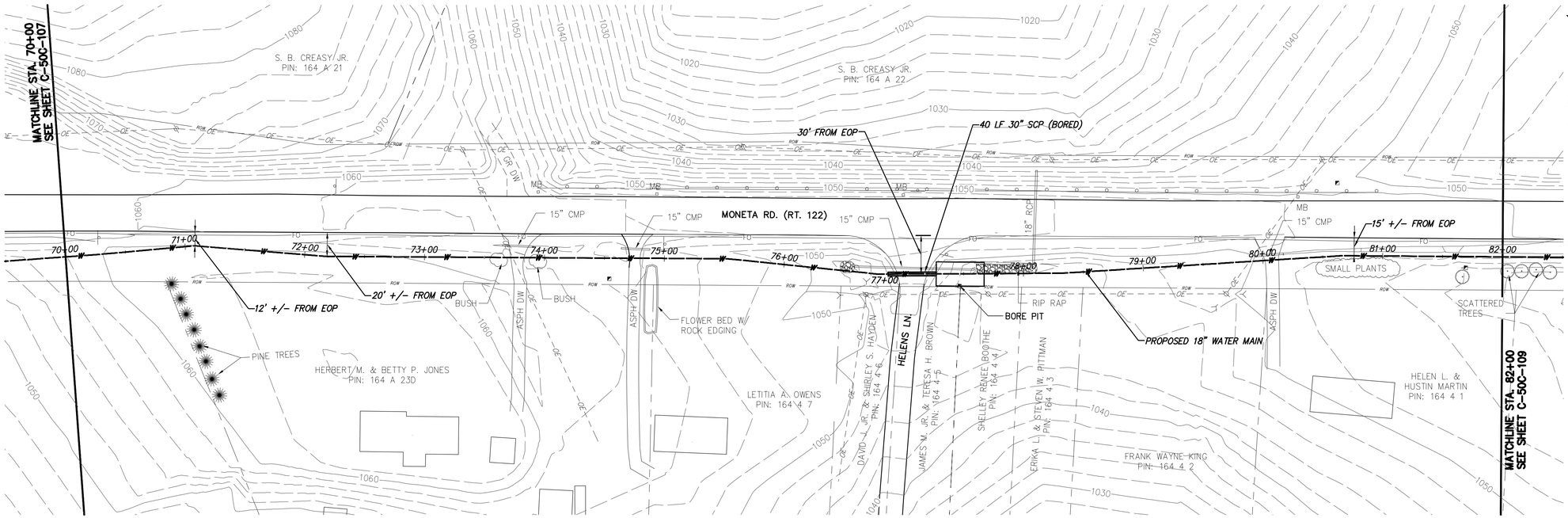
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-107
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-107-111_27872.DWG
Saved: 6/4/2015 10:26:02 AM Plotted: 6/4/2015 12:26:11 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



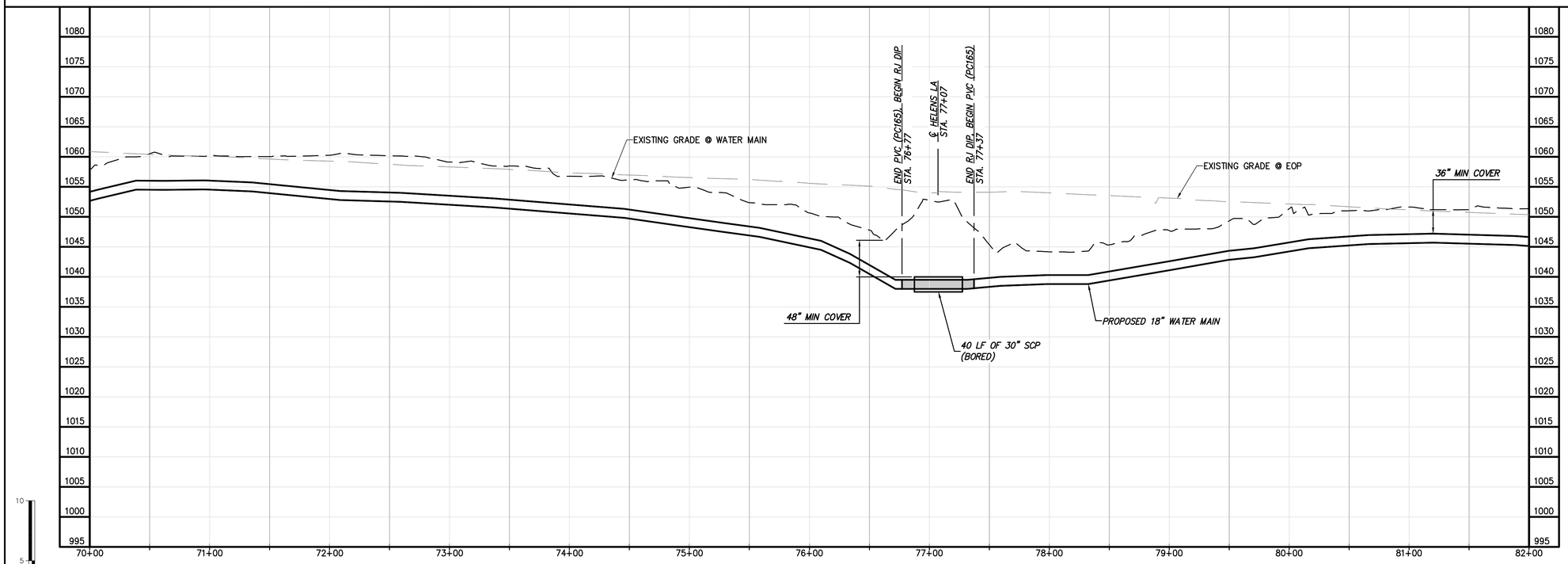
GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

WATER MAIN PLAN



WATER MAIN PROFILE

0 5 10

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:

DWG VER:

SAVED:
PLOTTED:
USER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

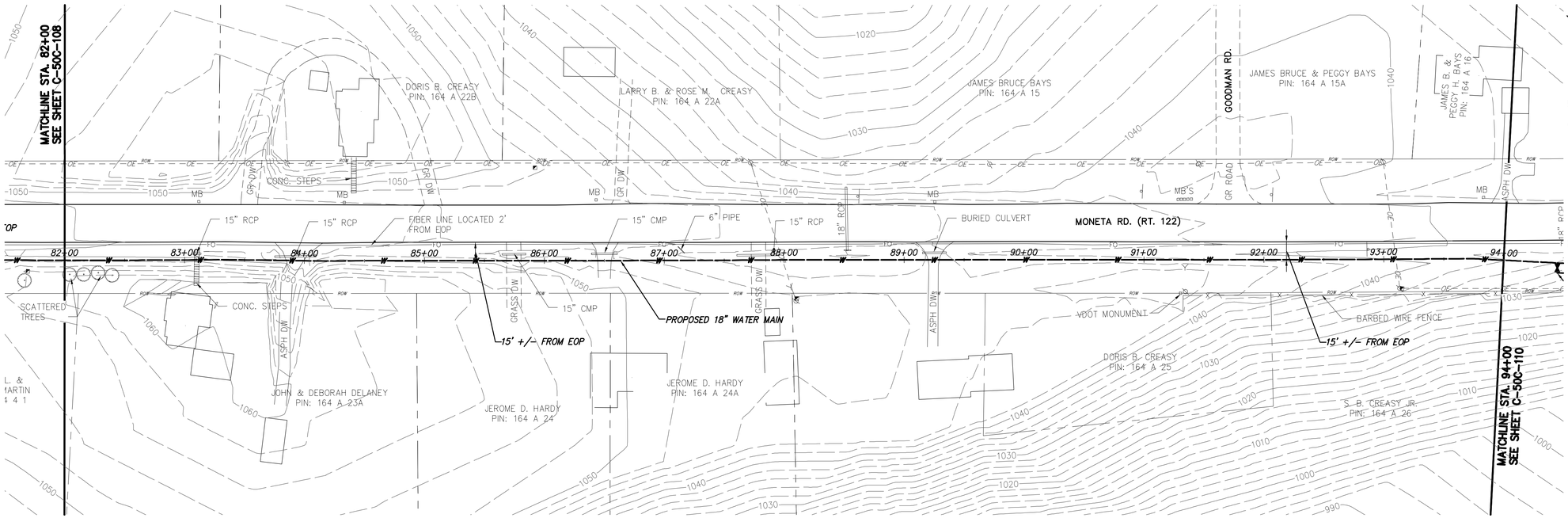
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-108
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-107-111_27872.DWG
Saved: 6/4/2015 10:26:02 AM Plotted: 6/4/2015 12:27:01 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



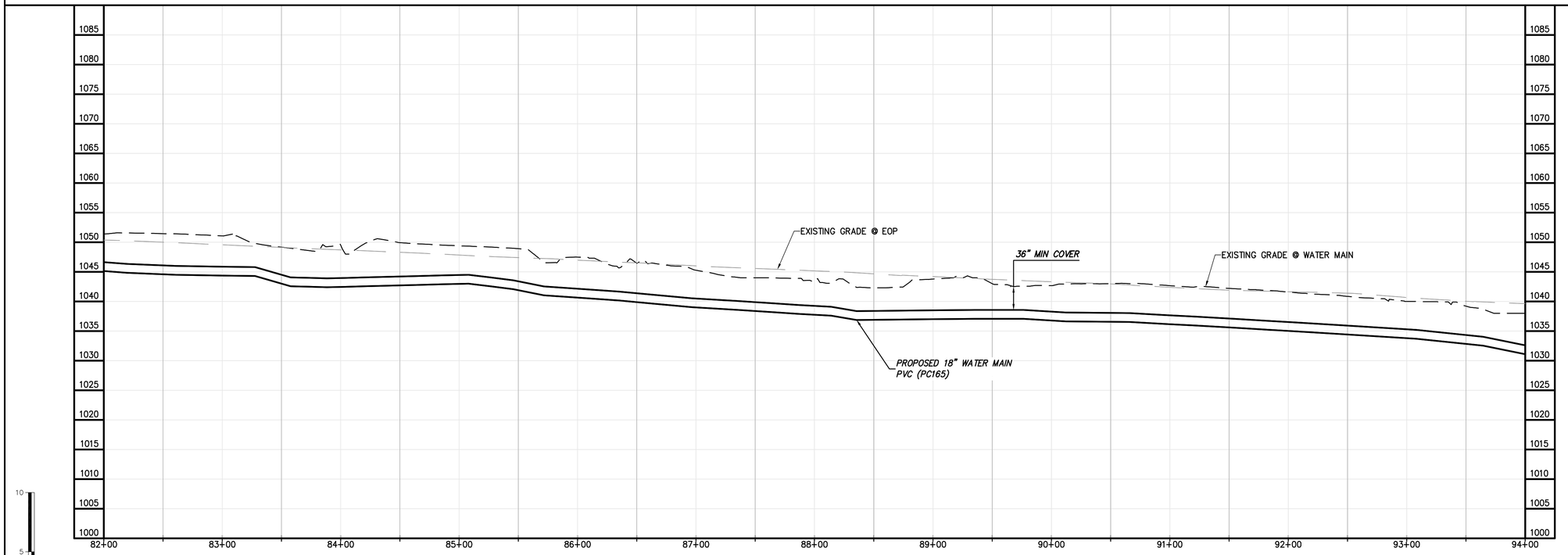
GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

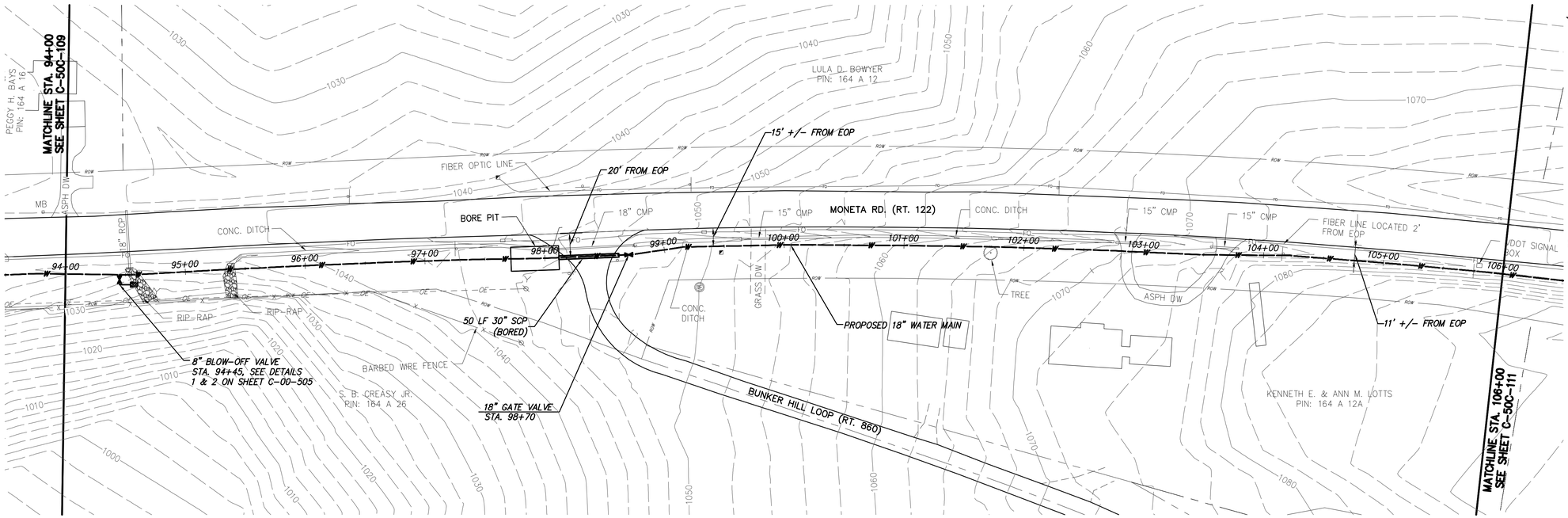
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

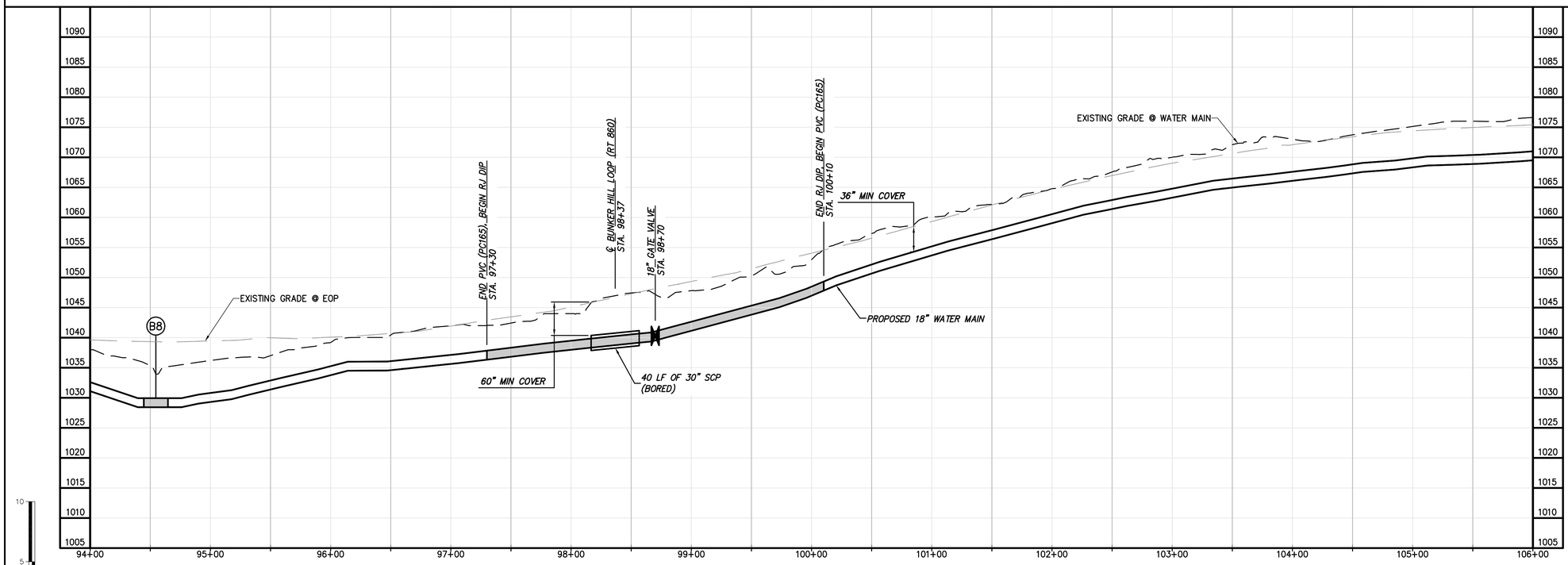
C-50C-109
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-107-111_27872.DWG
Saved: 6/4/2015 10:26:02 AM Plotted: 6/4/2015 12:27:50 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
6/4/2015
DATE

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:
SAVED:
PLOTTED:
USER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

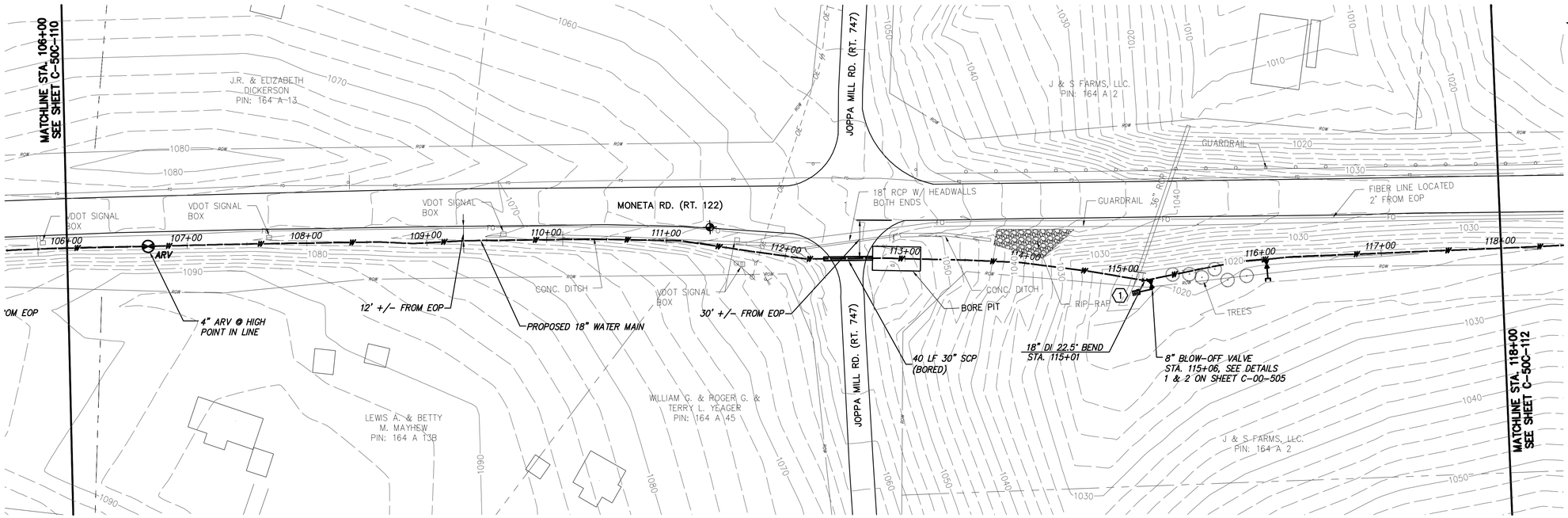
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

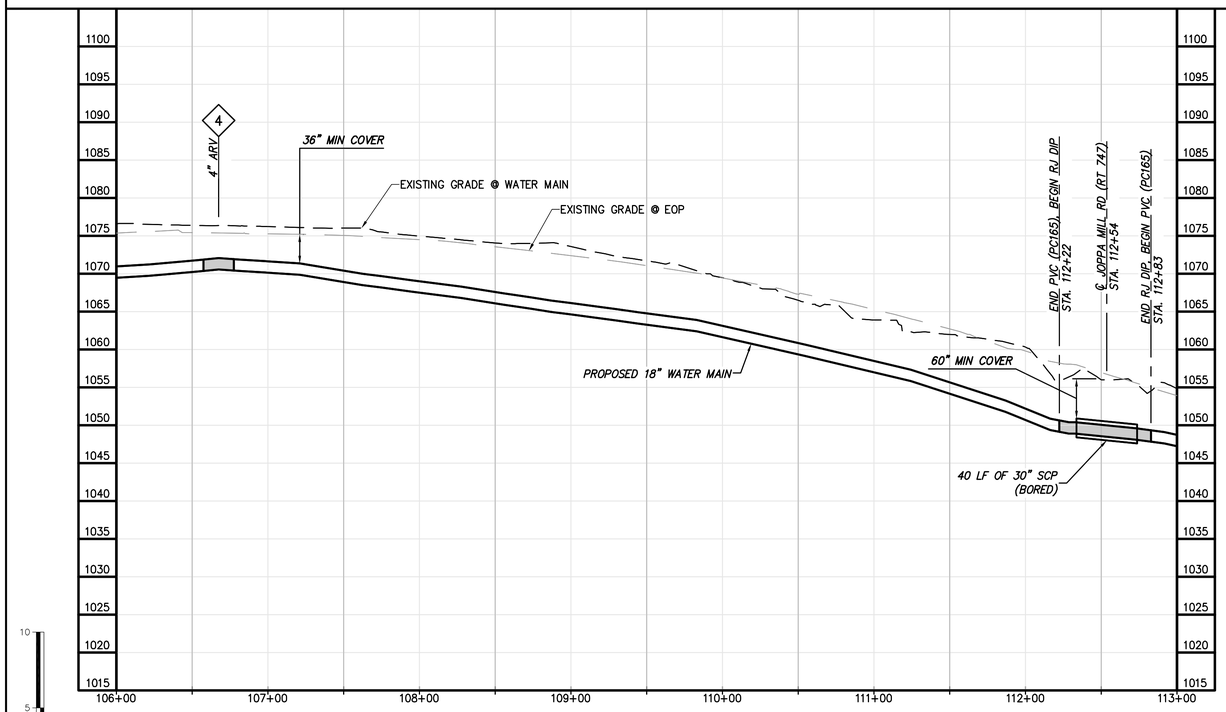
C-50C-110
SHEET
OF

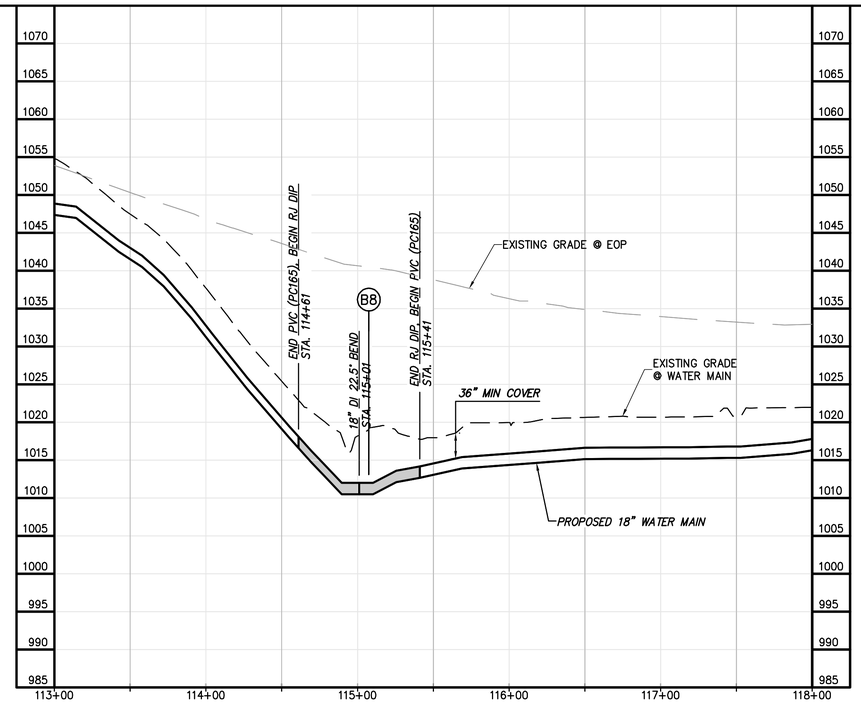
File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-107-111_27872.DWG
Saved: 6/4/2015 10:26:02 AM Plotted: 6/4/2015 12:28:40 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN





WATER MAIN PROFILE

Scale in feet: 0, 50, 100

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) RIP RAP CULVERT DISCHARGE.

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE: 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

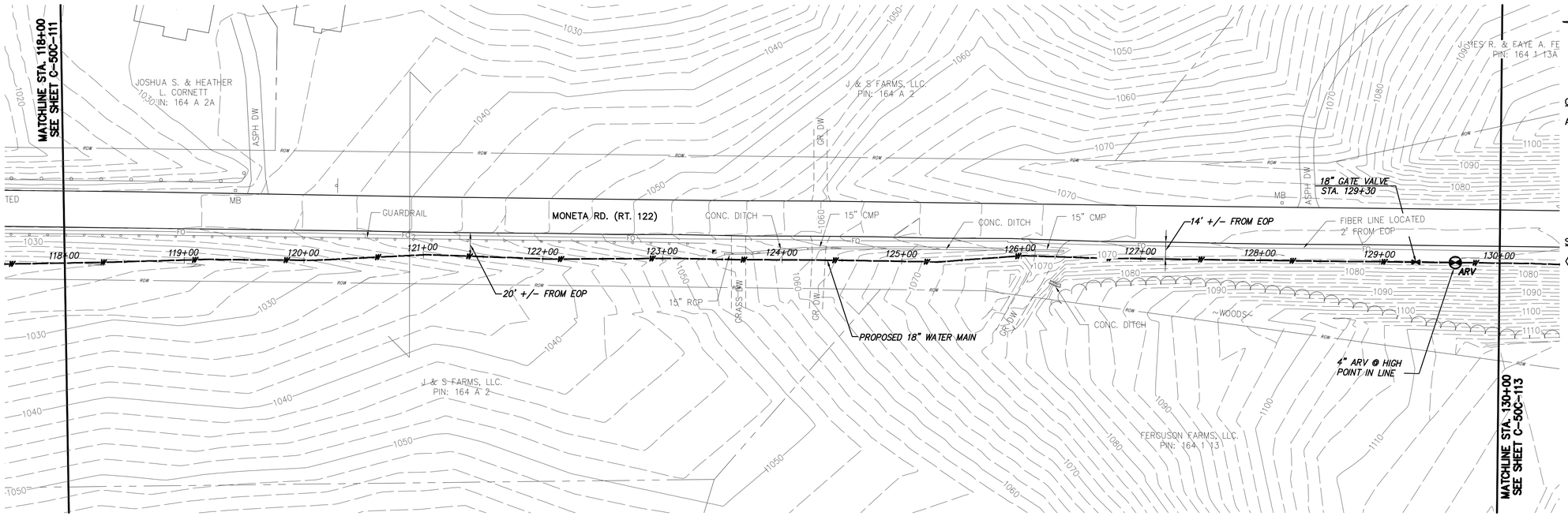
PROJECT NO.
27872

C-50C-111
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-107-111_27872.DWG
Saved: 6/4/2015 10:26:02 AM Plotted: 6/4/2015 12:29:51 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN

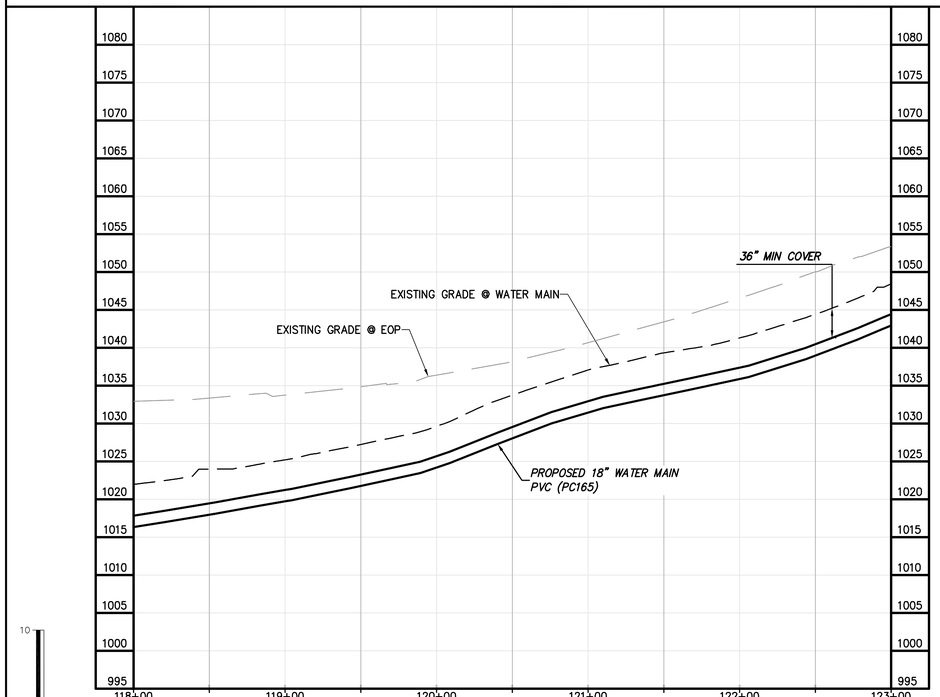
0 50 100
Scale in feet

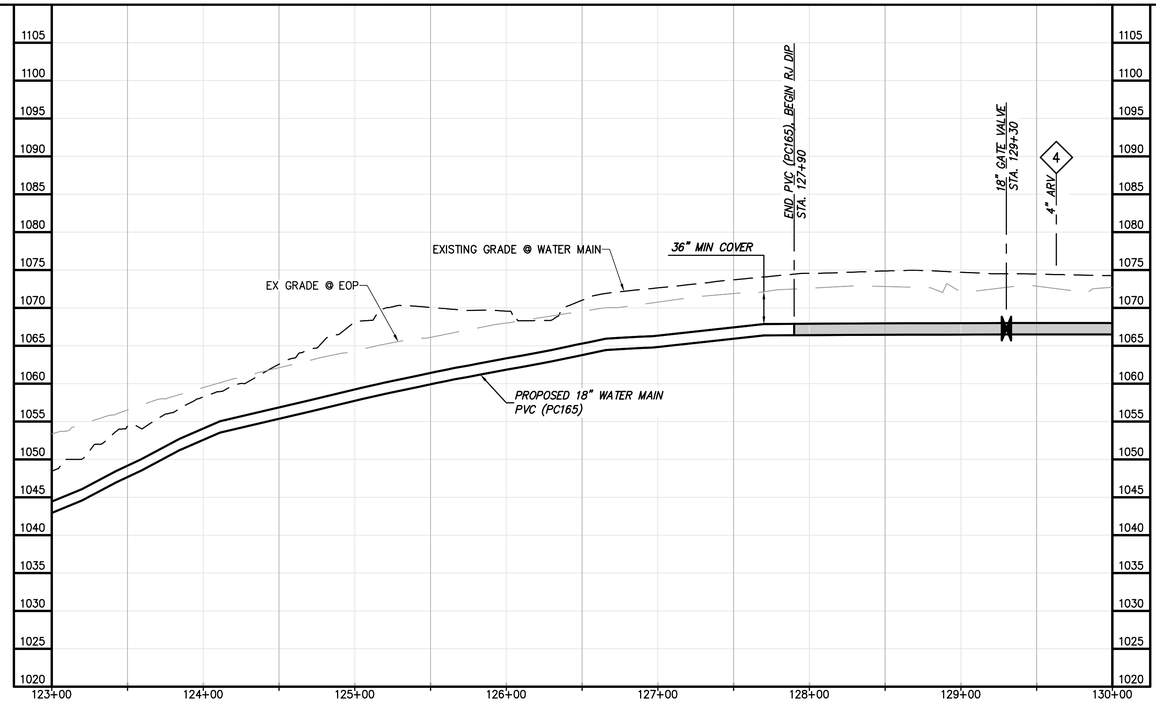
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——





WATER MAIN PROFILE

10 5 0
0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE: 6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:

XREF1:
XREF2:
XREF3:
XREF4:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

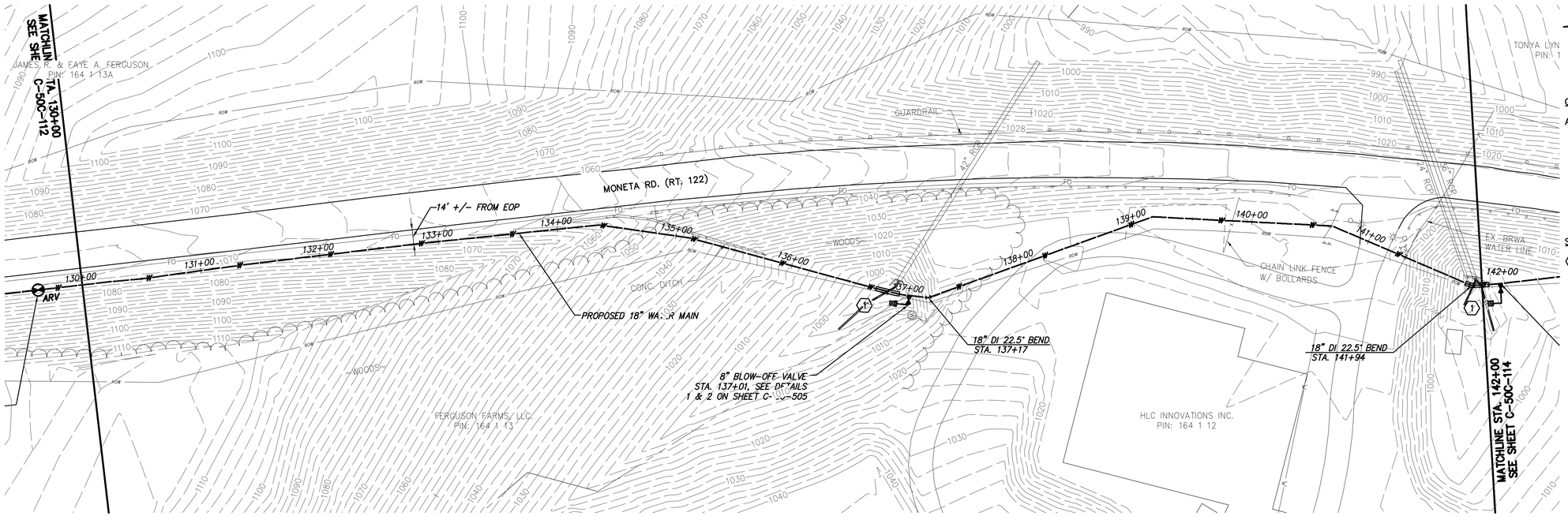
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

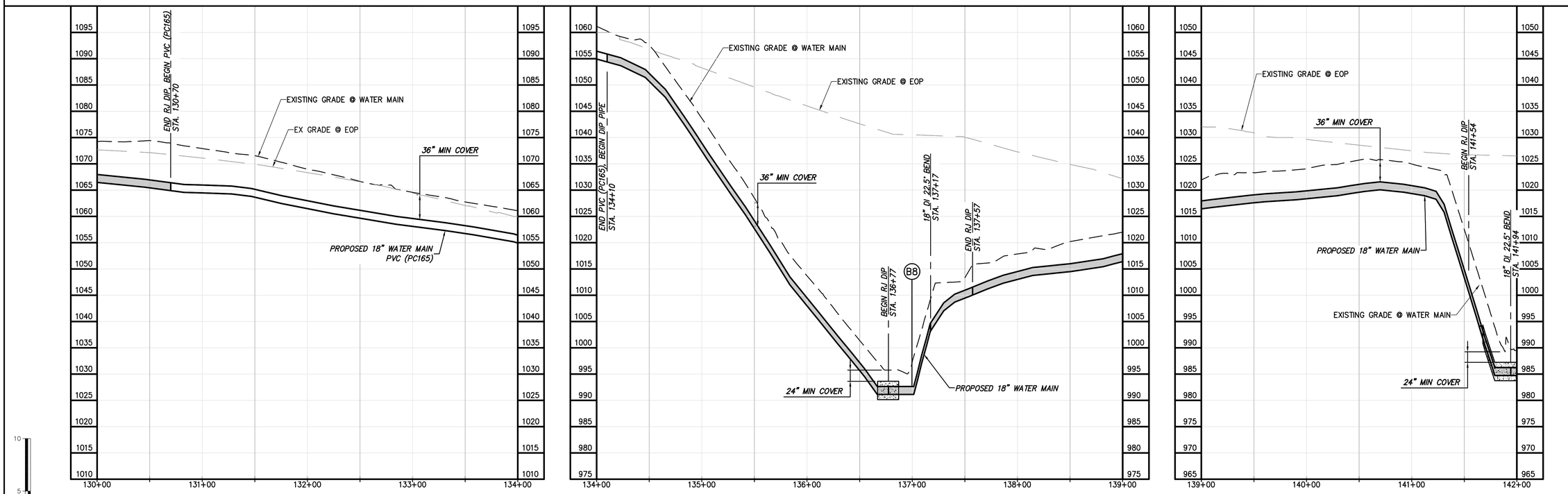
C-50C-112
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-112-116_27872.DWG
Saved: 6/4/2015 10:26:38 AM Plotted: 6/4/2015 12:33:03 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:

XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

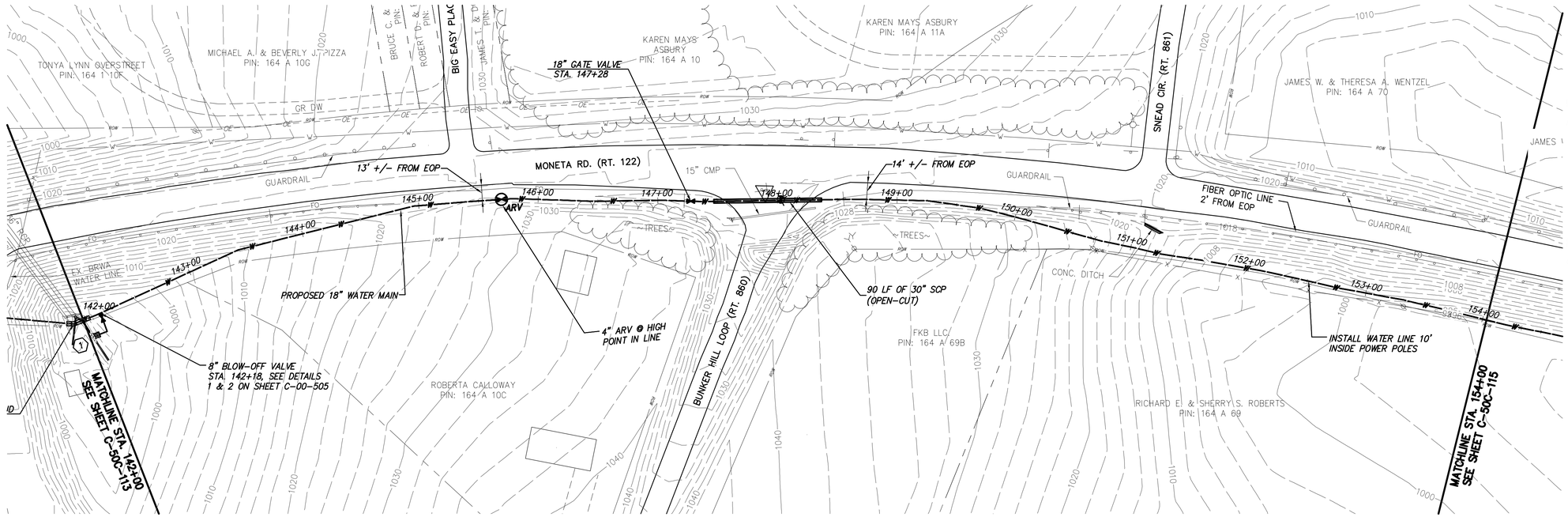
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-113
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-112-116_27872.DWG
Saved: 6/4/2015 10:26:38 AM Plotted: 6/4/2015 12:34:34 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



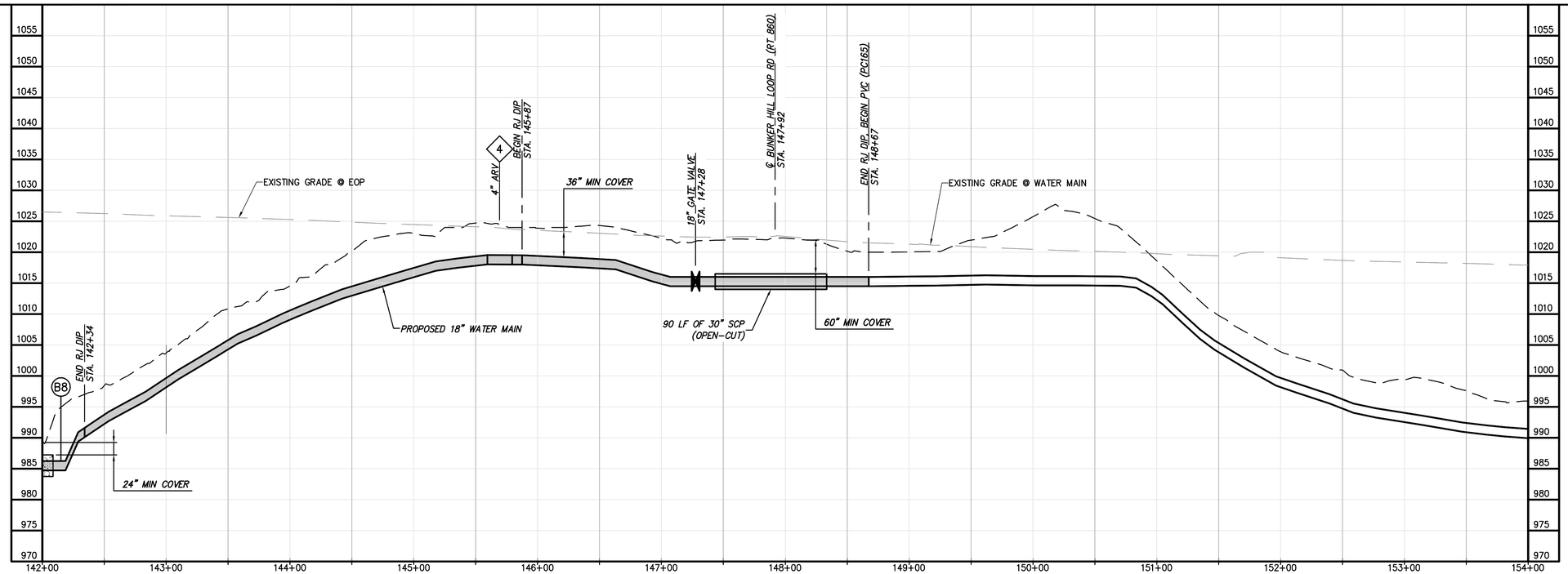
WATER MAIN PLAN

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——



WATER MAIN PROFILE

0 5 10

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS 6/4/2015

LEVEL 3 DESIGN DOCUMENTS

DATE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

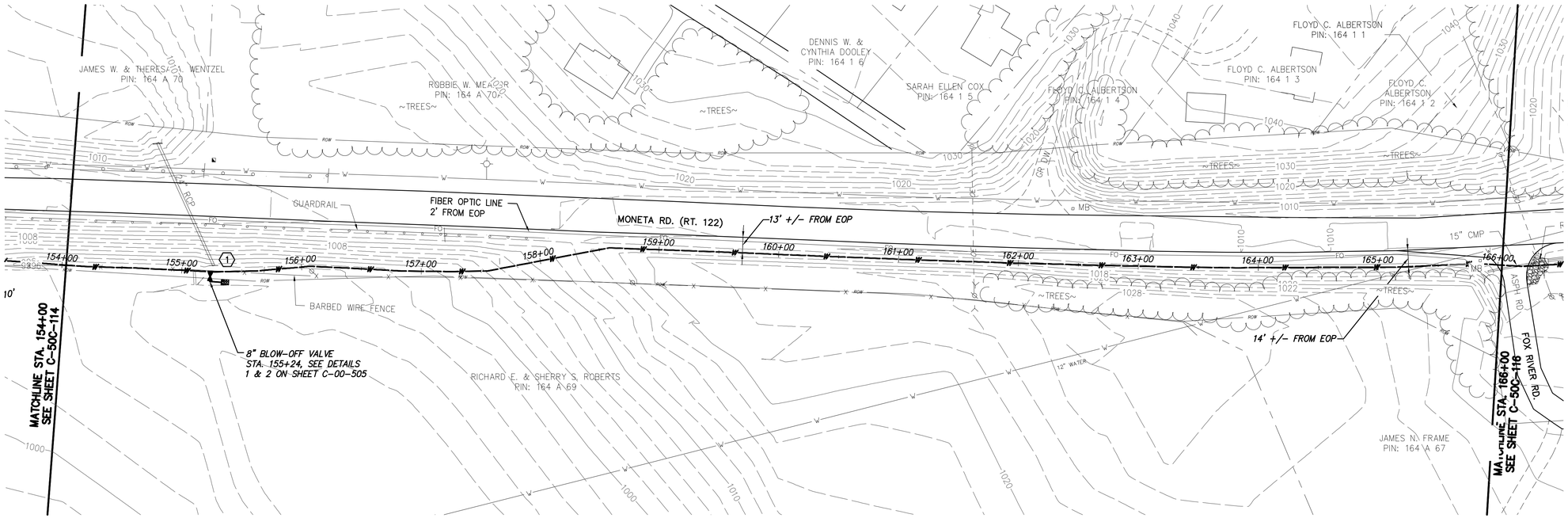
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

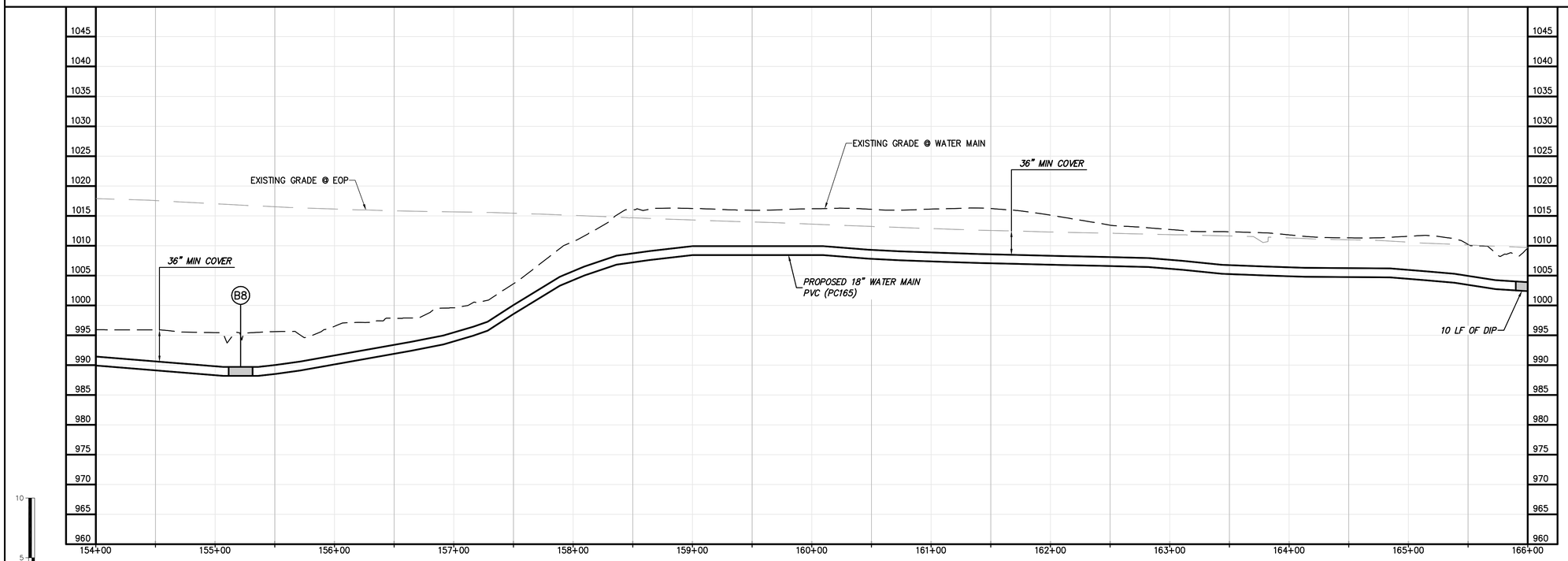
C-50C-114
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-112-116_27872.DWG
Saved: 6/4/2015 10:26:38 AM Plotted: 6/4/2015 12:35:25 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 RIP RAP CULVERT DISCHARGE.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5648 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

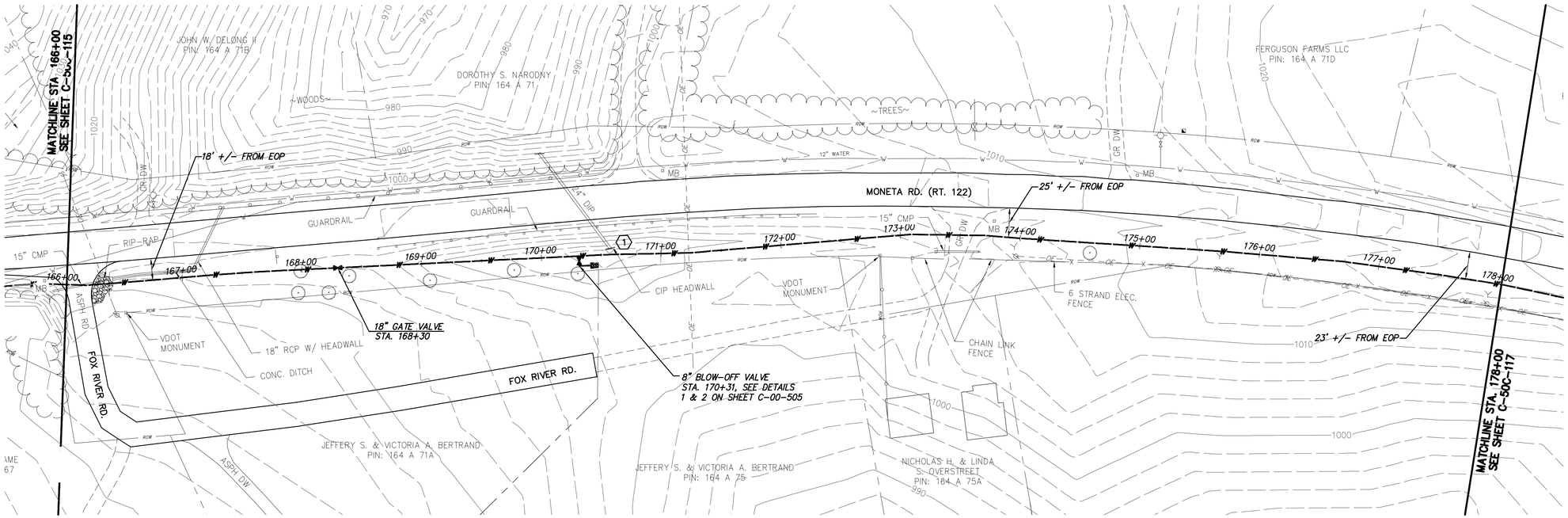
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

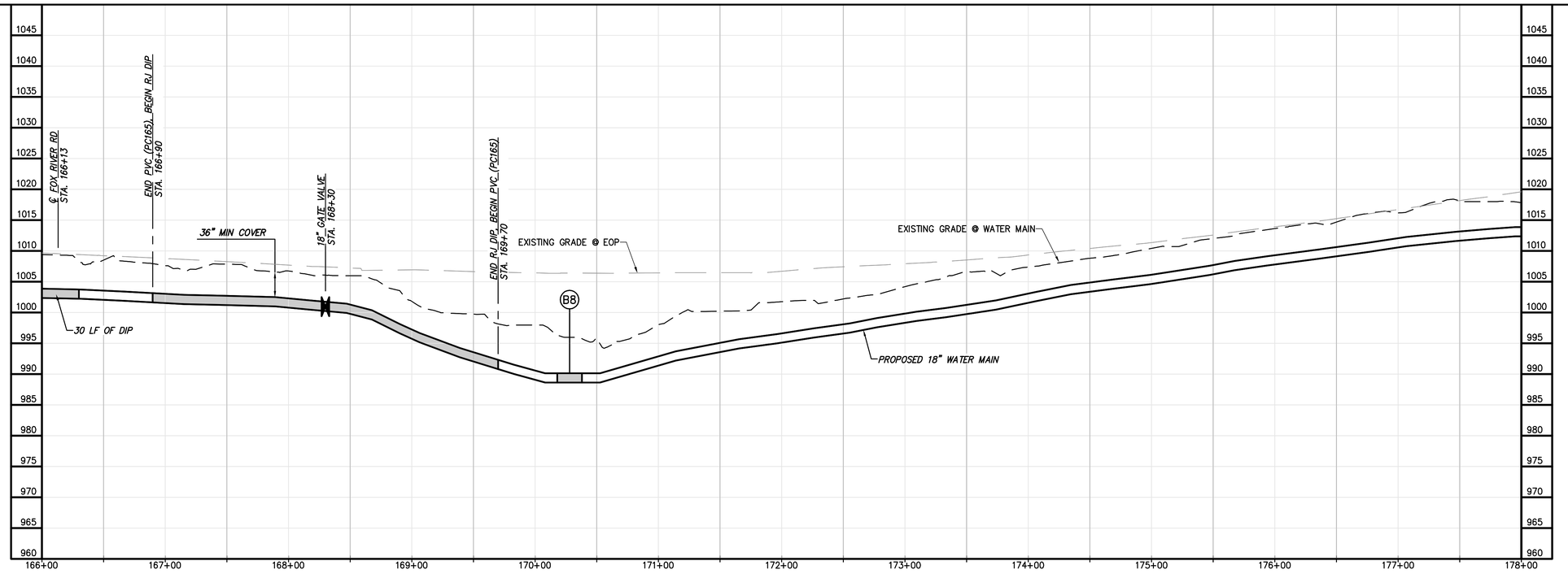
C-50C-115
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ1\27872\CADD_ACAD\C-50C-112-116_27872.DWG
Saved: 6/4/2015 10:26:38 AM Plotted: 6/4/2015 12:36:16 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) RIP RAP CULVERT DISCHARGE.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

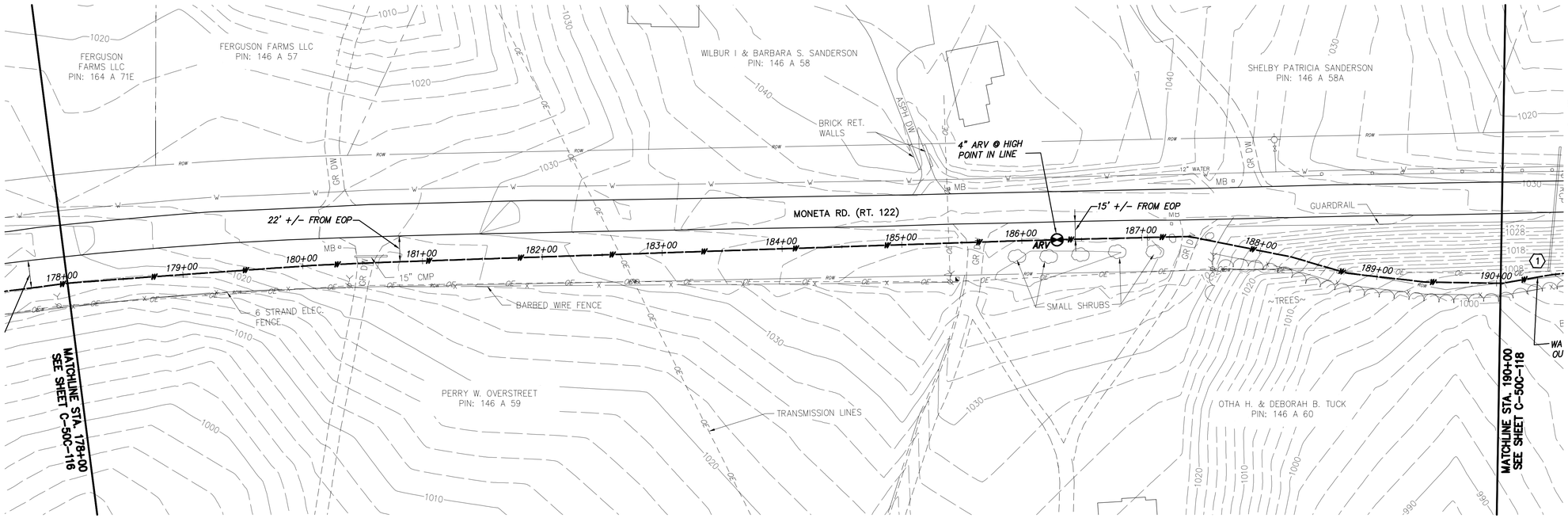
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

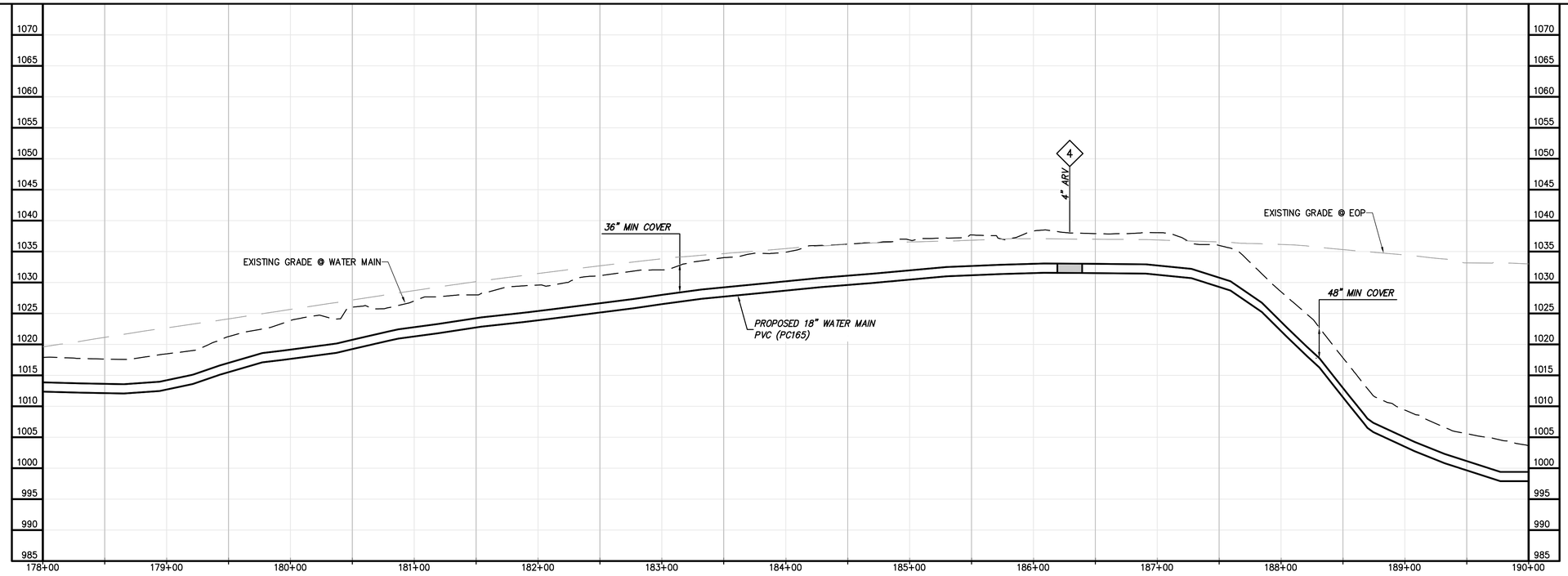
C-50C-116
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-112-116_27872.DWG
Saved: 6/4/2015 10:26:38 AM Plotted: 6/4/2015 12:37:10 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

0 5 10

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

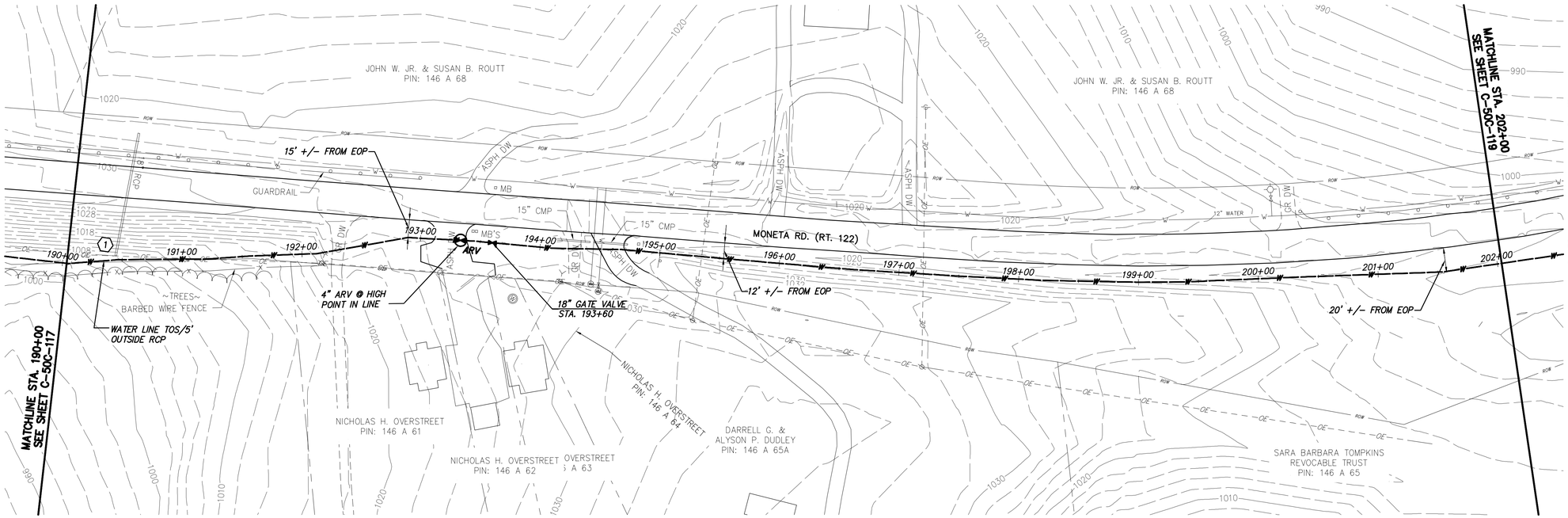
PROJECT NO.
27872

C-50C-117
SHEET
OF

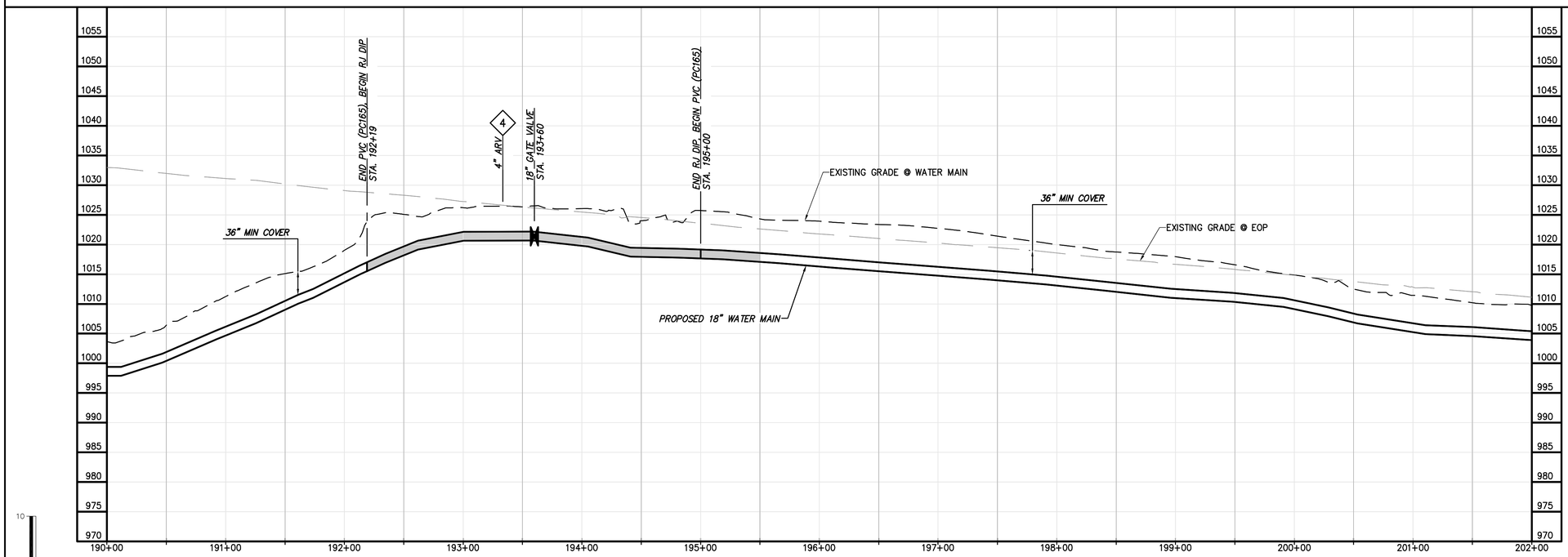
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-117-121_27872.DWG
Saved: 6/4/2015 10:27:13 AM Plotted: 6/4/2015 12:40:01 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

Scale in feet: 0, 50, 100

GENERAL NOTES:

A.

SPECIFIC NOTES

1. RIP RAP CULVERT DISCHARGE.

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

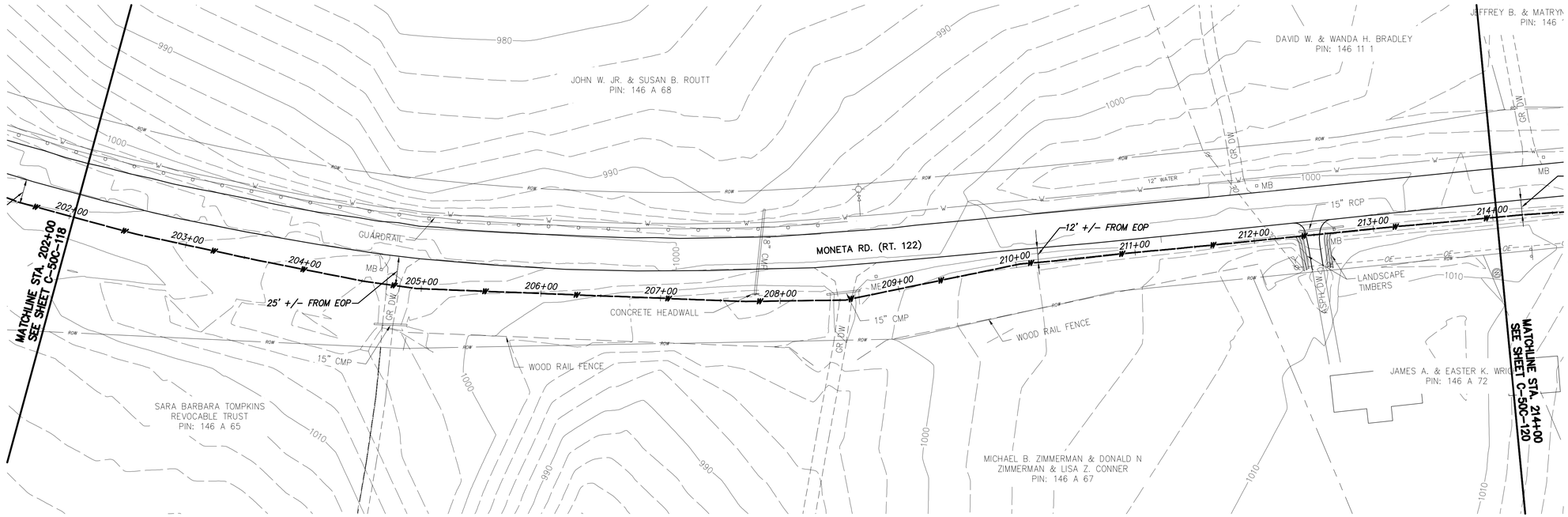
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

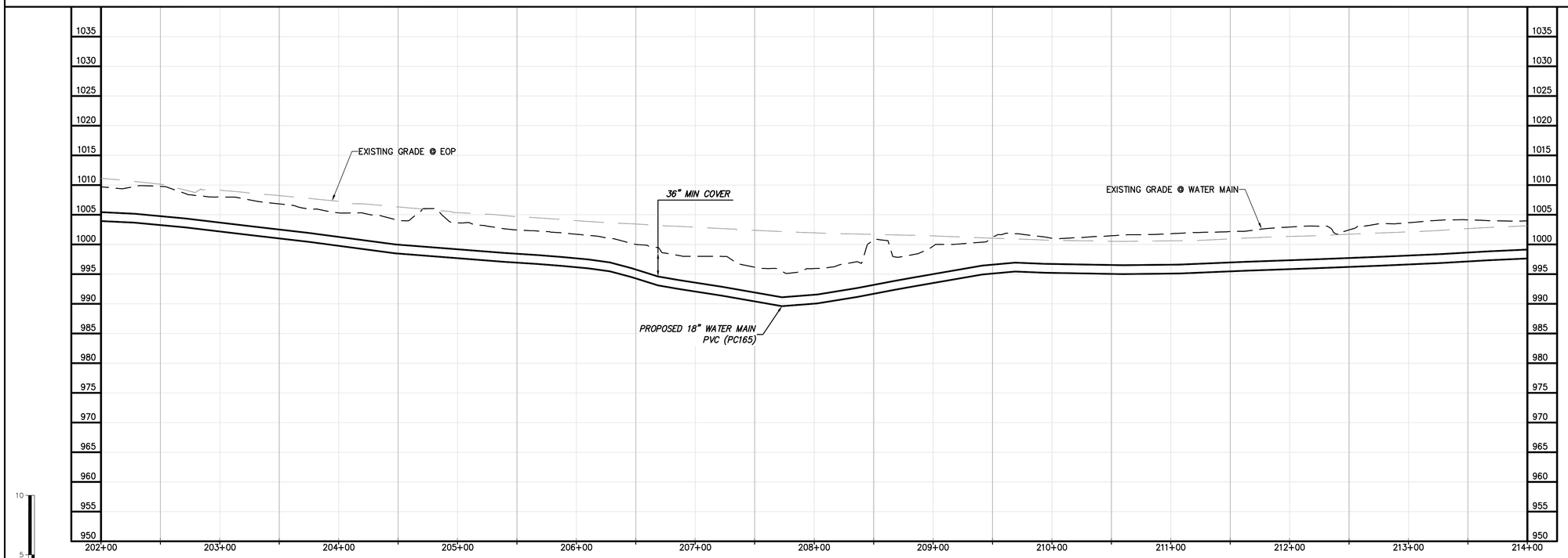
C-50C-118
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-117-121_27872.DWG
Saved: 6/4/2015 10:27:13 AM Plotted: 6/4/2015 12:40:53 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

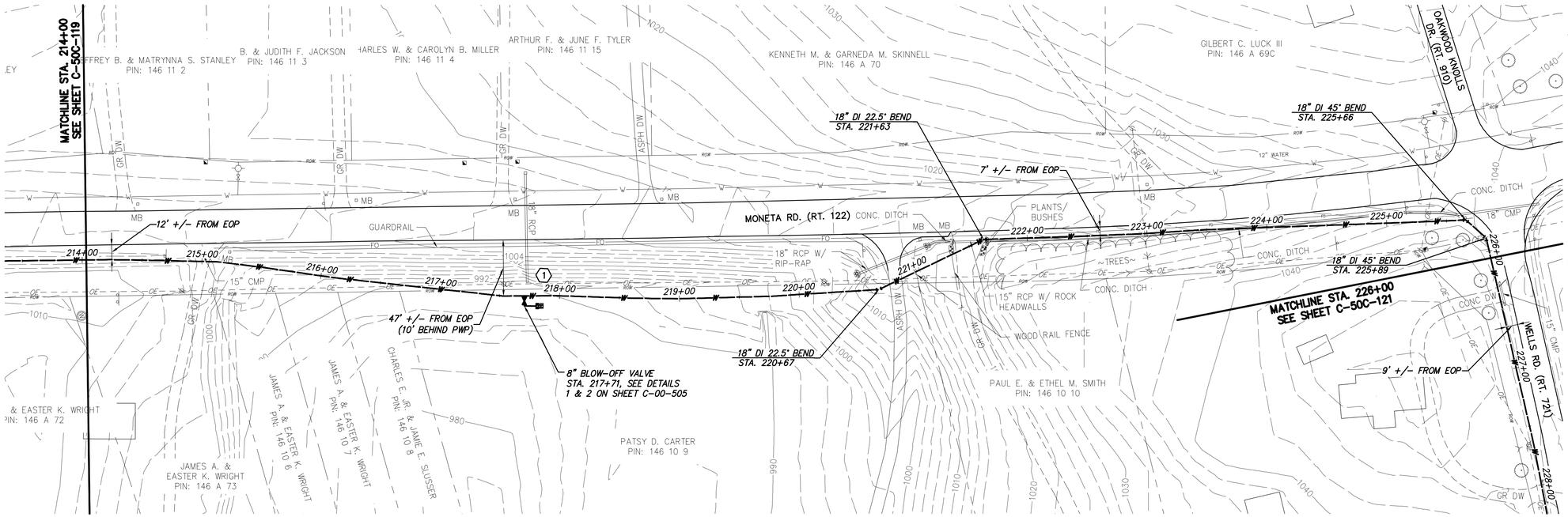
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-119
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-117-121_27872.DWG
Saved: 6/4/2015 10:27:13 AM Plotted: 6/4/2015 12:41:42 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



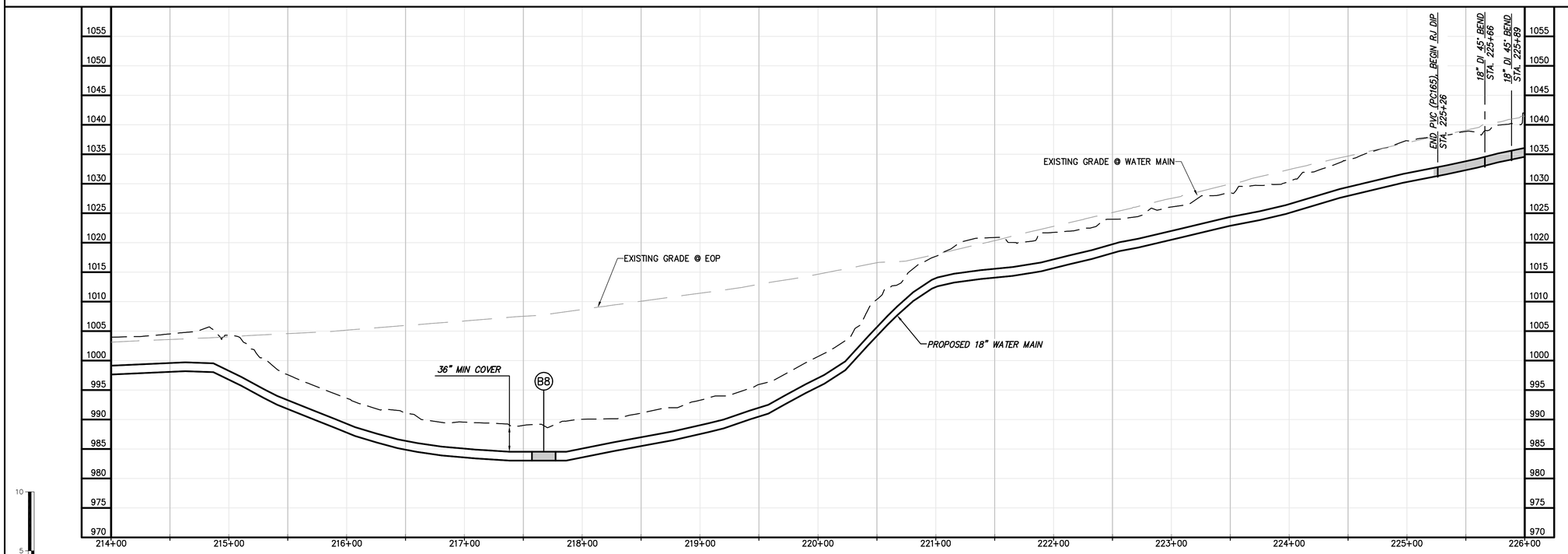
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) RIP RAP CULVERT DISCHARGE.

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	GLM
CHECKED:	BSR
APPROVED:	SMS
DATE:	

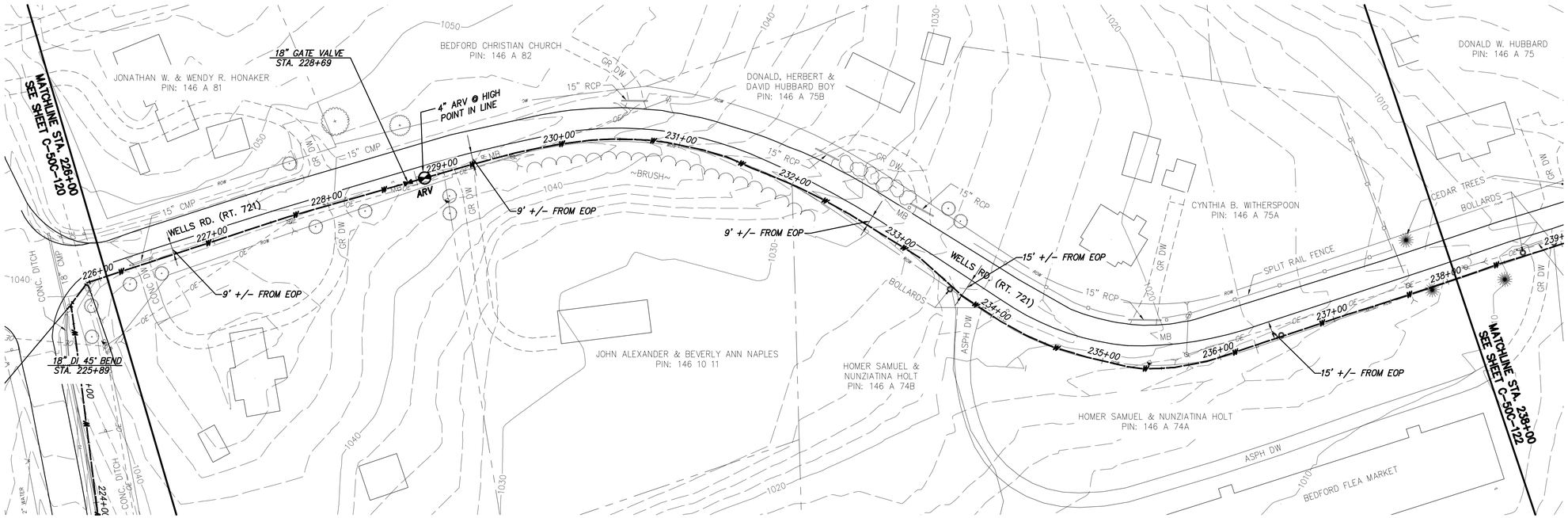
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

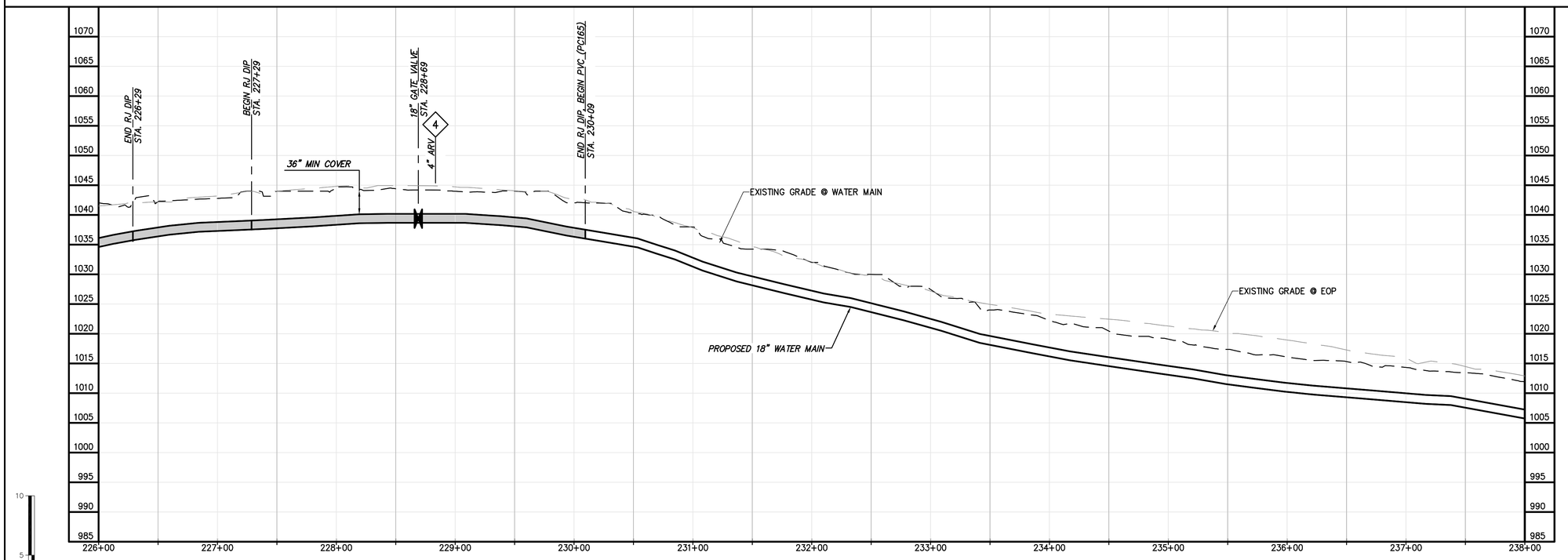
C-50C-120
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-117-121_27872.DWG
Saved: 6/4/2015 10:27:13 AM Plotted: 6/4/2015 12:42:31 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS 6/4/2015

LEVEL 3 DESIGN DOCUMENTS

DATE

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

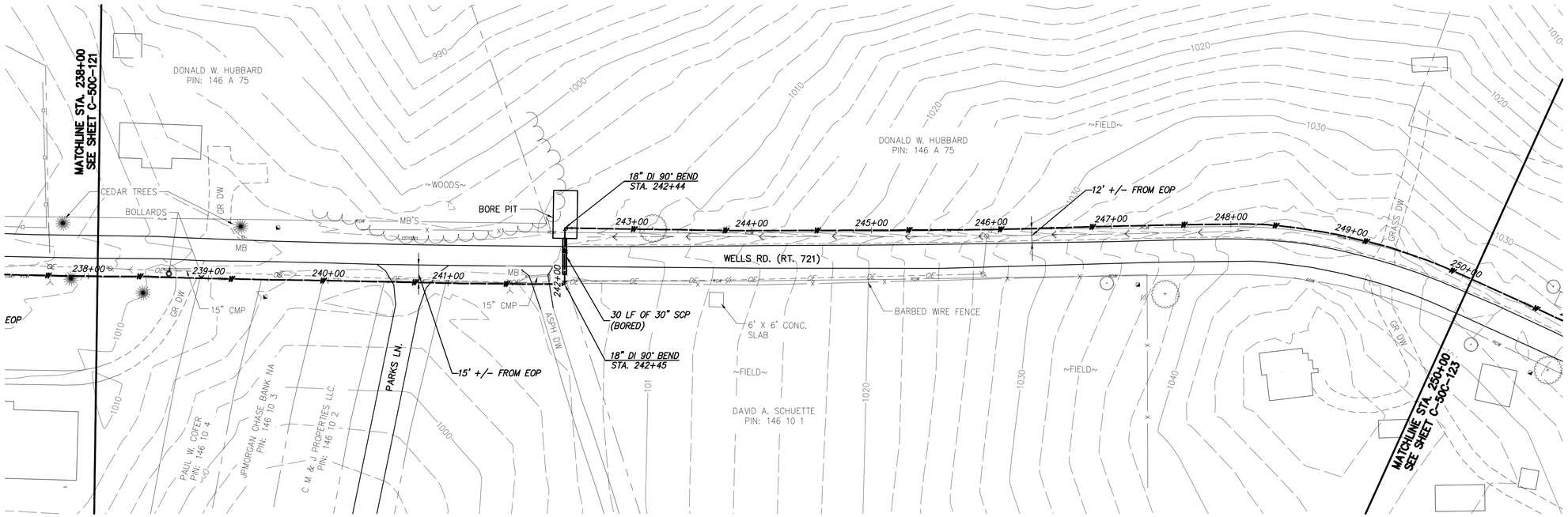
PROJECT NO.
27872

C-50C-121
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-117-121_27872.DWG
Saved: 6/4/2015 10:27:13 AM Plotted: 6/4/2015 12:43:22 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



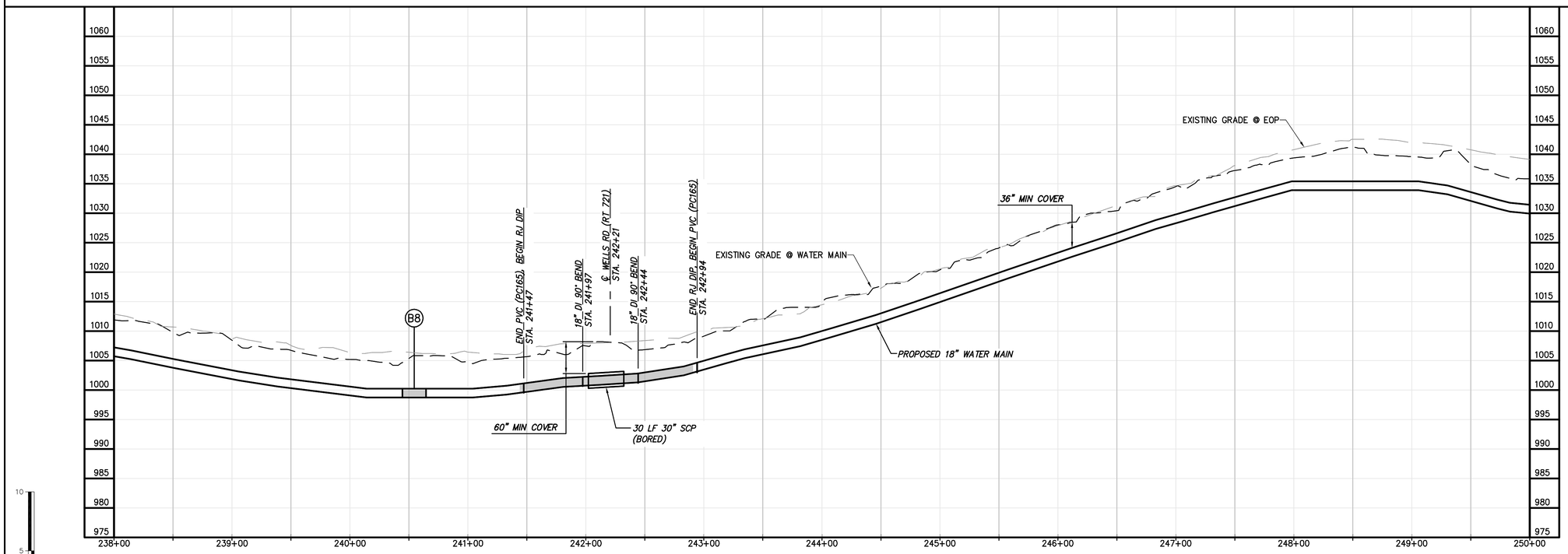
WATER MAIN PLAN

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

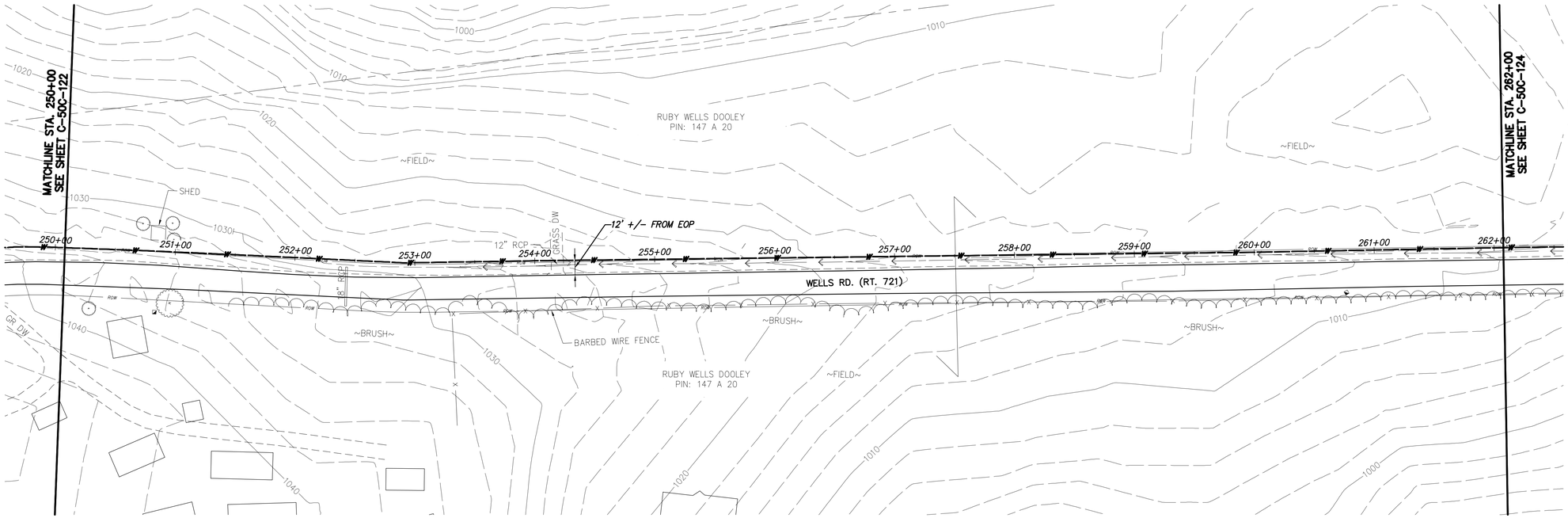
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

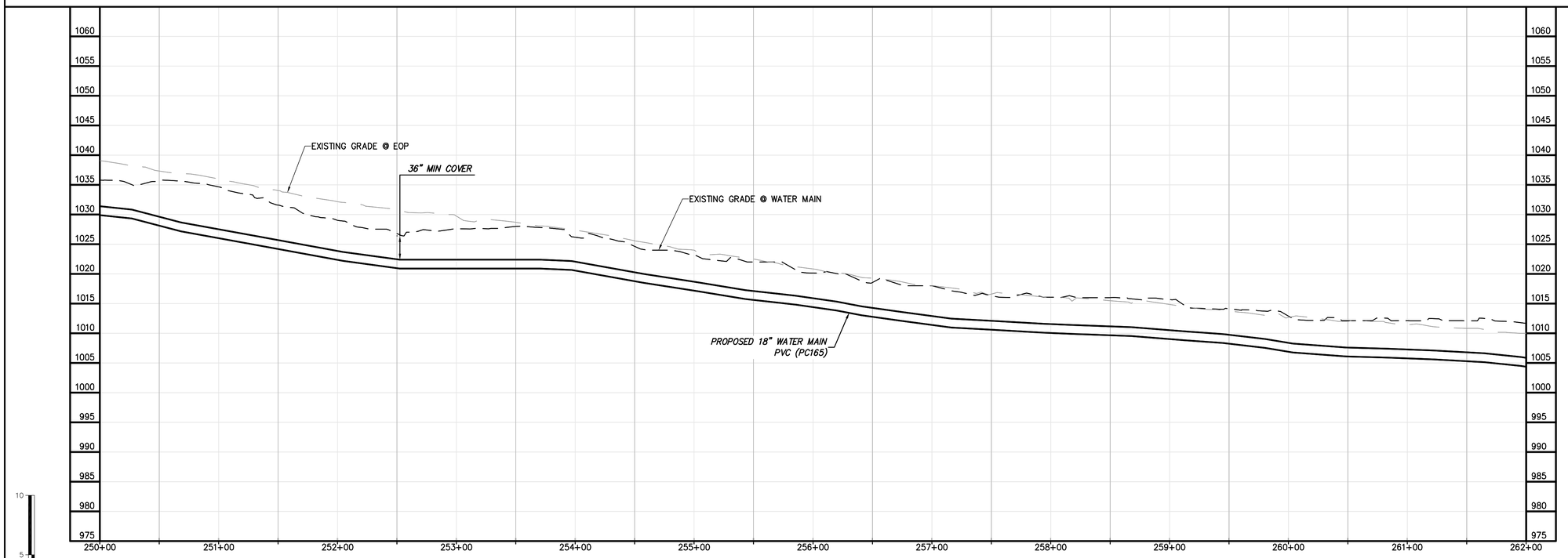
C-50C-122
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-122-124_27872.DWG
Saved: 6/4/2015 10:27:35 AM Plotted: 6/4/2015 12:46:08 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ____

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

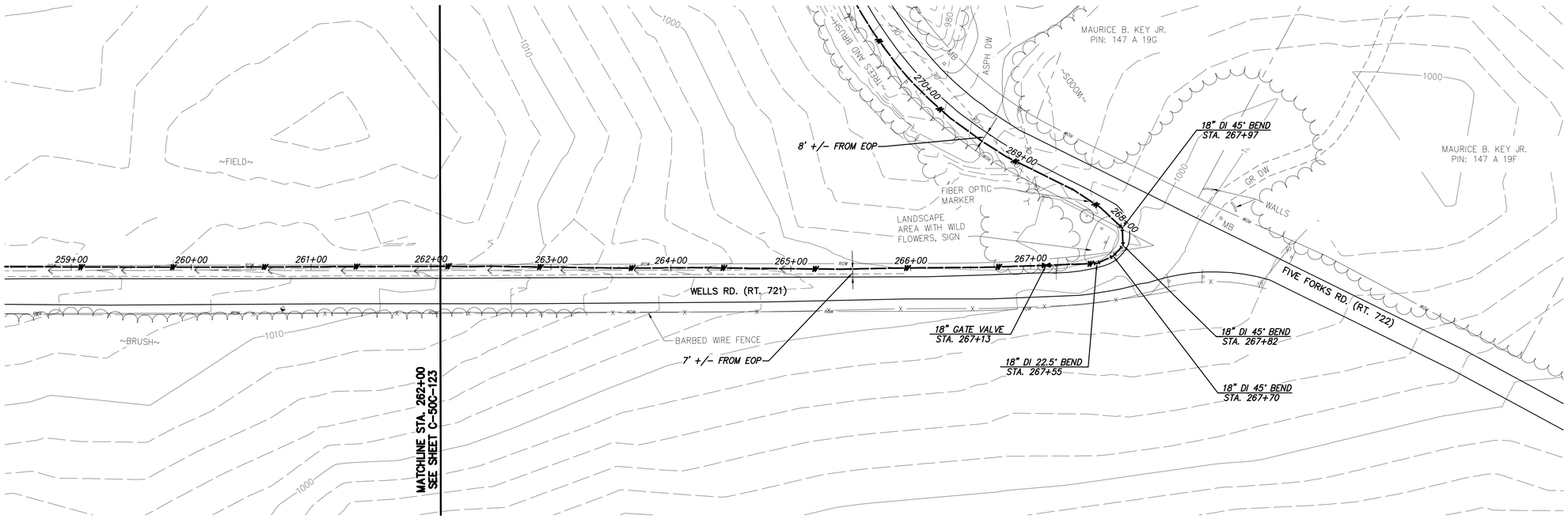
PROJECT NO.
27872

C-50C-123
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-122-124_27872.DWG
Saved: 6/4/2015 10:27:35 AM Plotted: 6/4/2015 12:46:58 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



0 50 100
Scale in feet

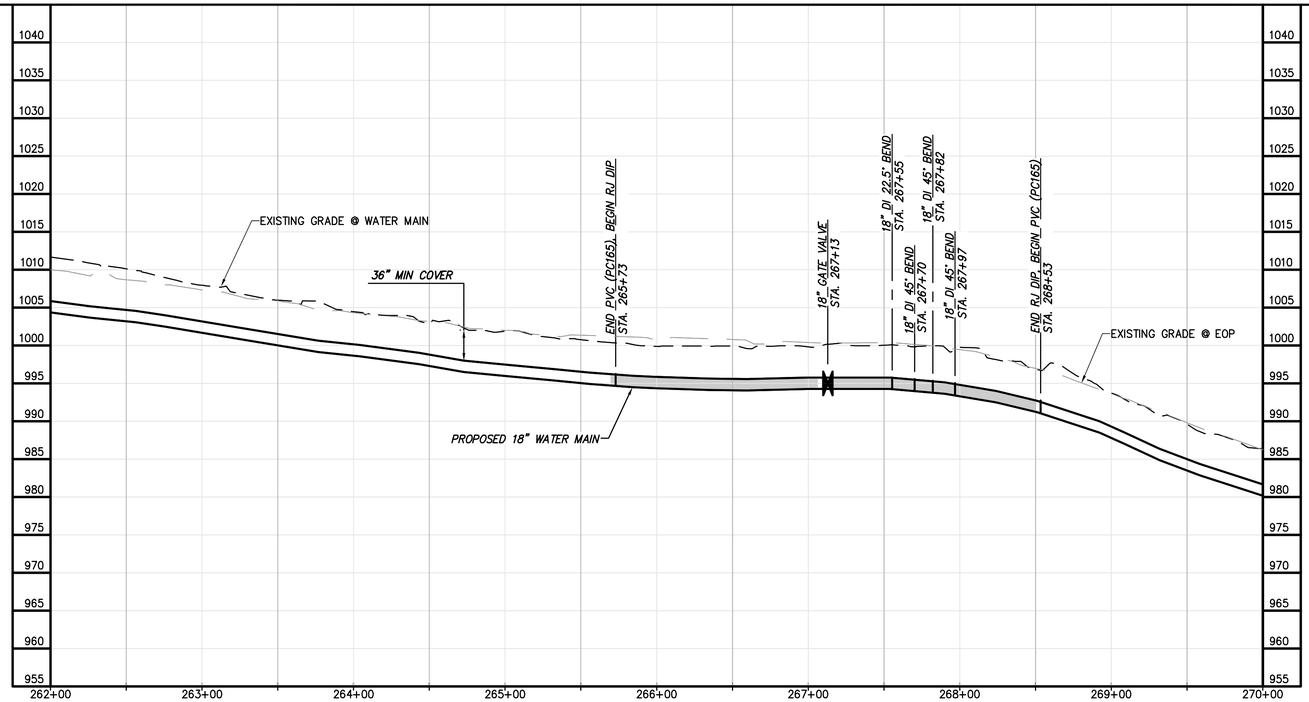
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

WATER MAIN PLAN



WATER MAIN PROFILE

10 5 0
0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
1	GLM	JRM	SMS
2	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

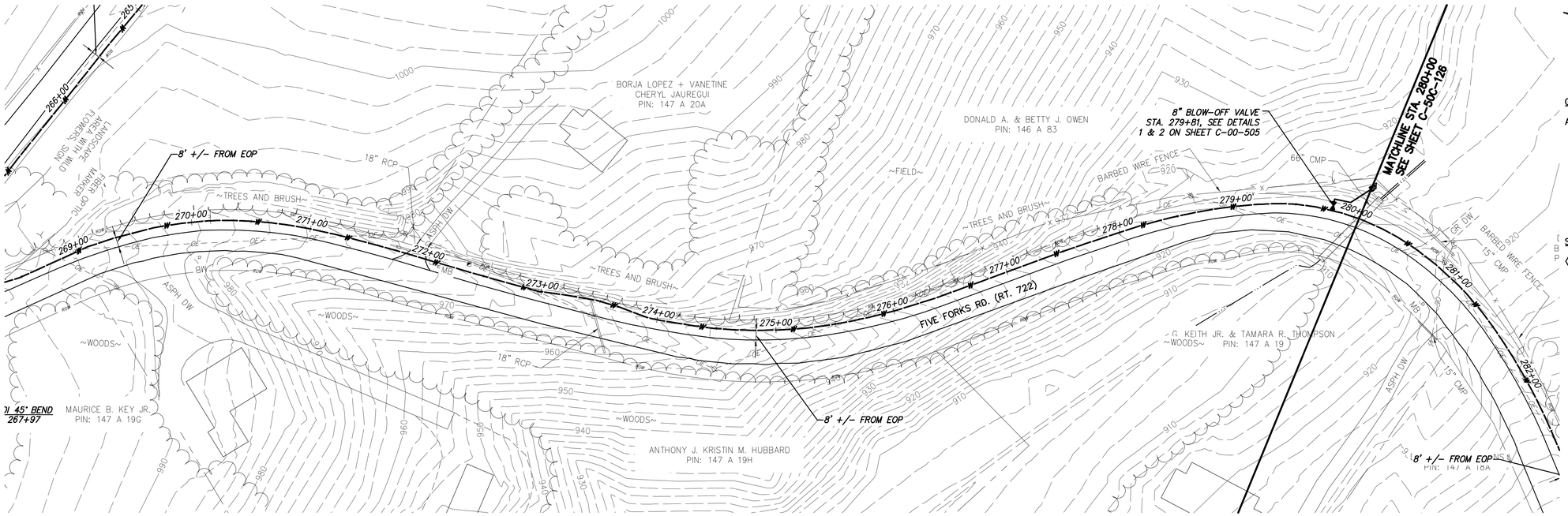
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

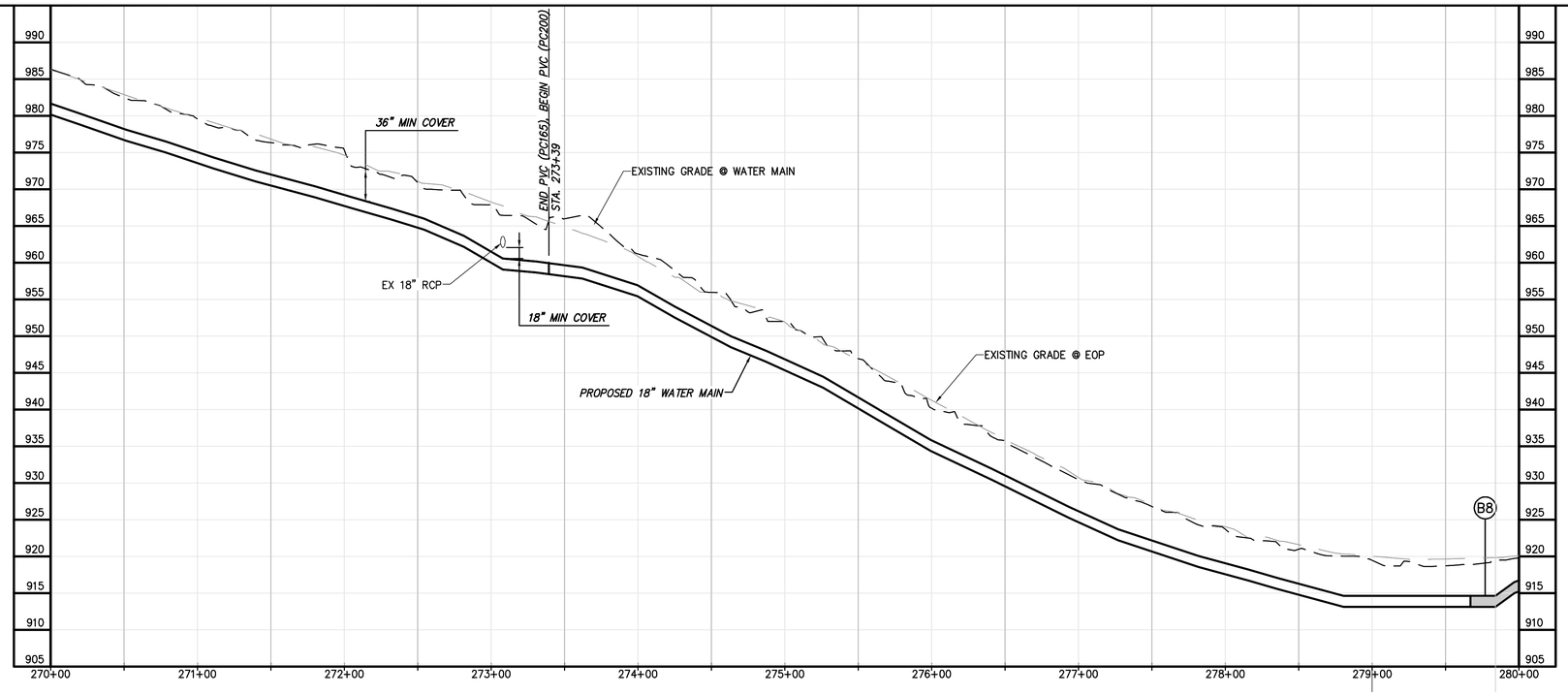
PROJECT NO.
27872

C-50C-124
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-122-124_27872.DWG
Saved: 6/4/2015 10:27:35 AM Plotted: 6/4/2015 12:47:47 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
6/4/2015
DATE
REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

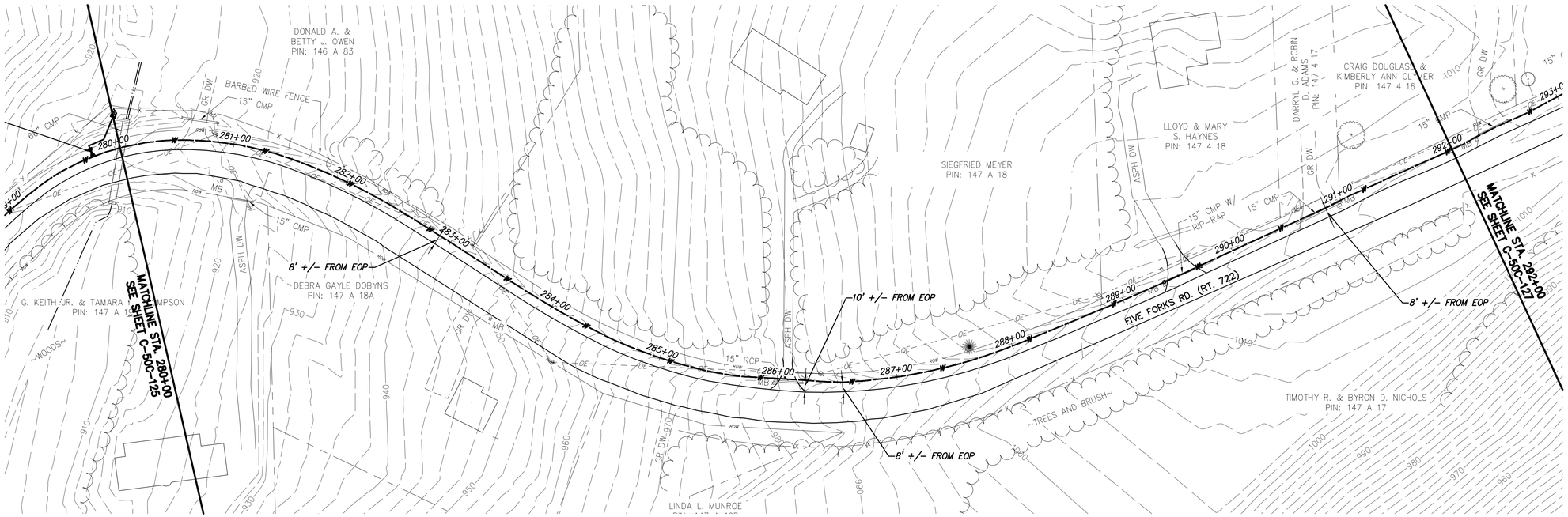
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-125
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-125-129_27872.DWG
Saved: 6/4/2015 10:28:12 AM Plotted: 6/4/2015 12:50:37 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



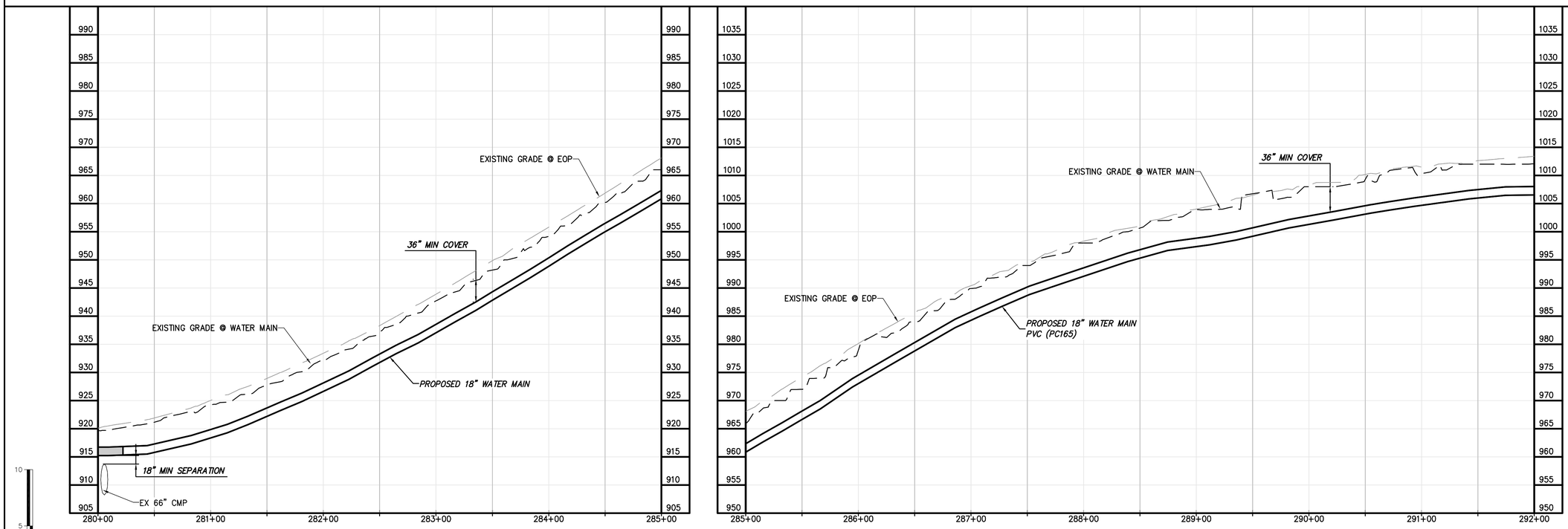
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

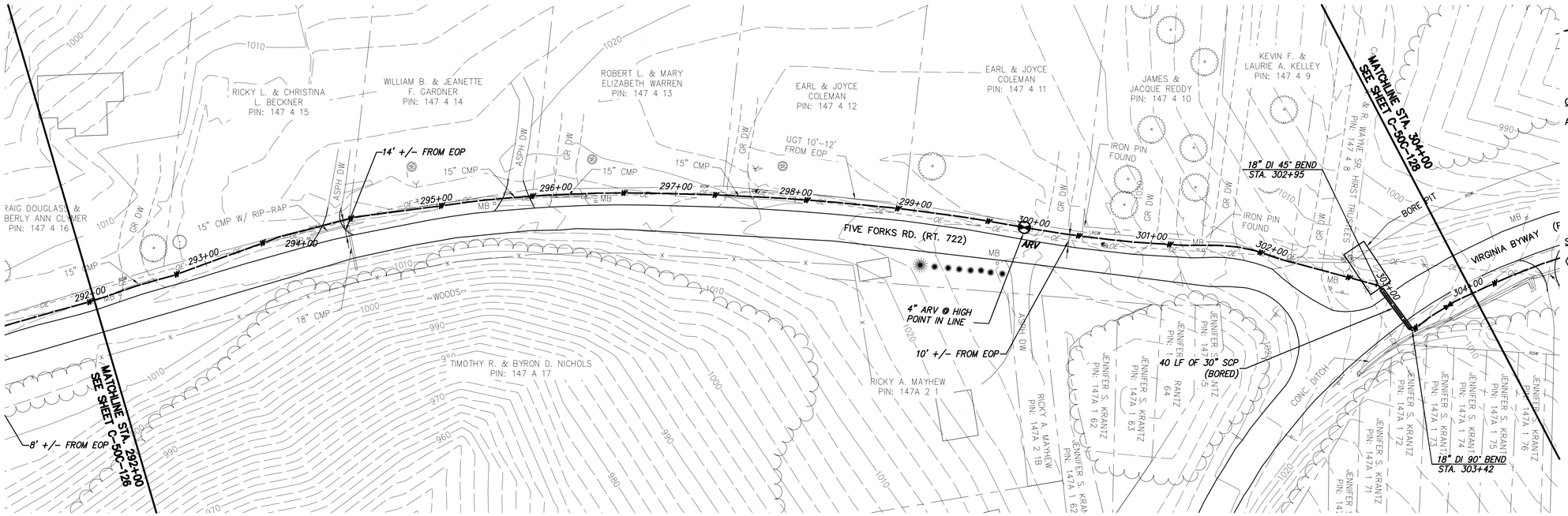
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

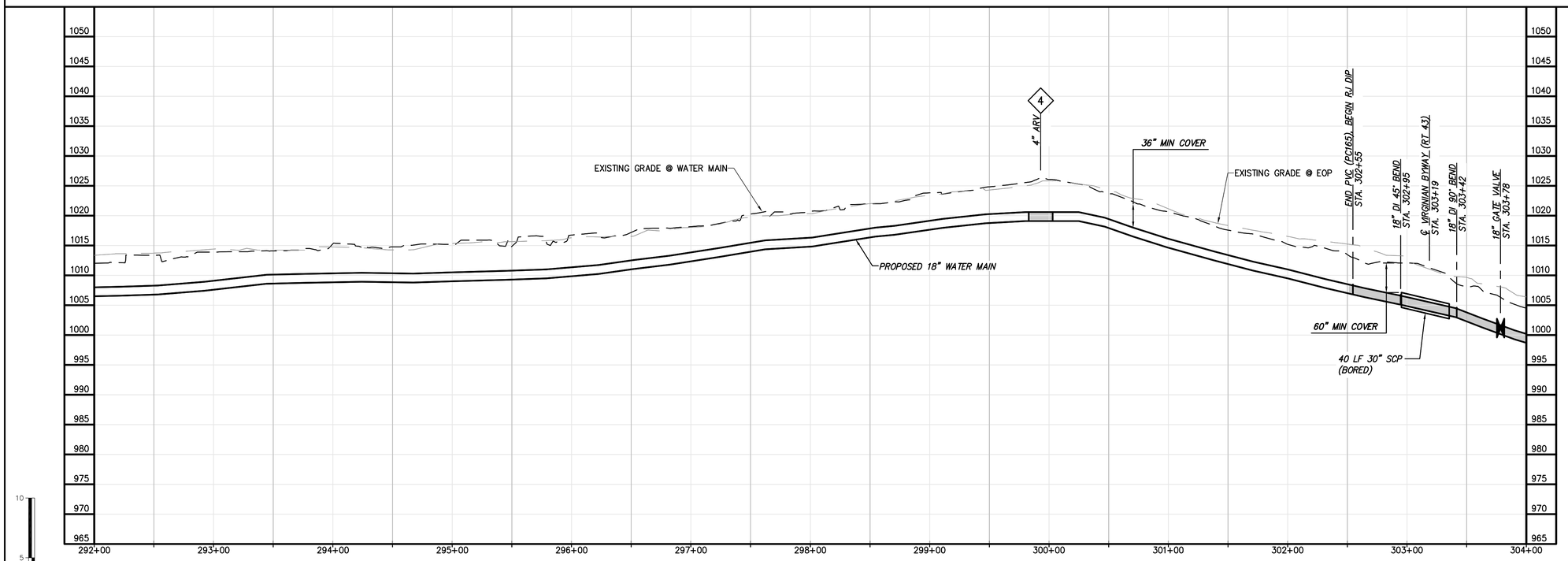
C-50C-126
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-125-129_27872.DWG
Saved: 6/4/2015 10:28:12 AM Plotted: 6/4/2015 12:51:47 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

SAVED:
PLOTTED:
USER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

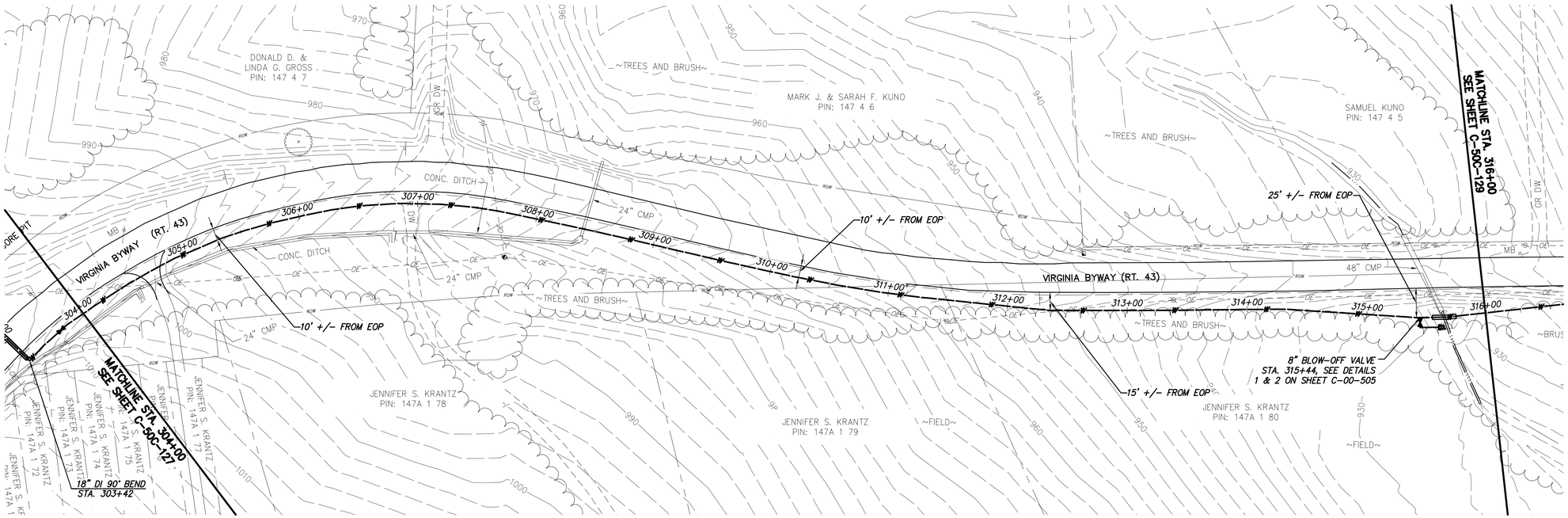
PROJECT NO.
27872

C-50C-127
SHEET
OF

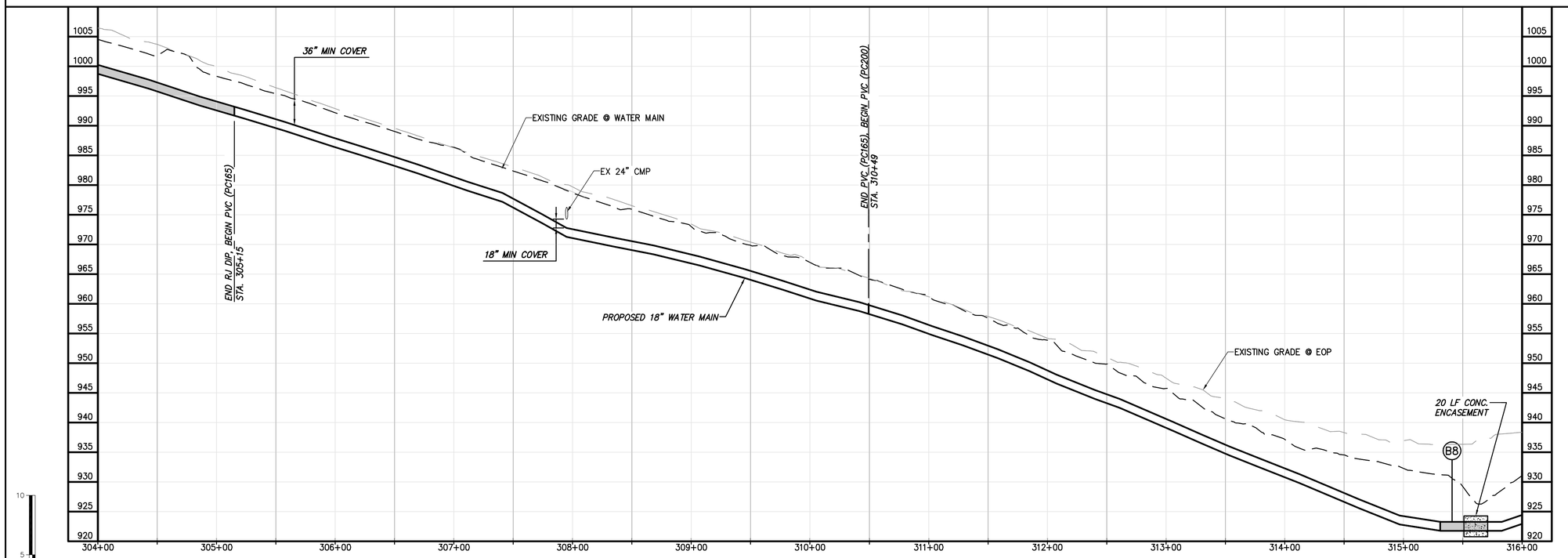
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-125-129_27872.DWG
Saved: 6/4/2015 10:28:12 AM Plotted: 6/4/2015 12:52:39 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

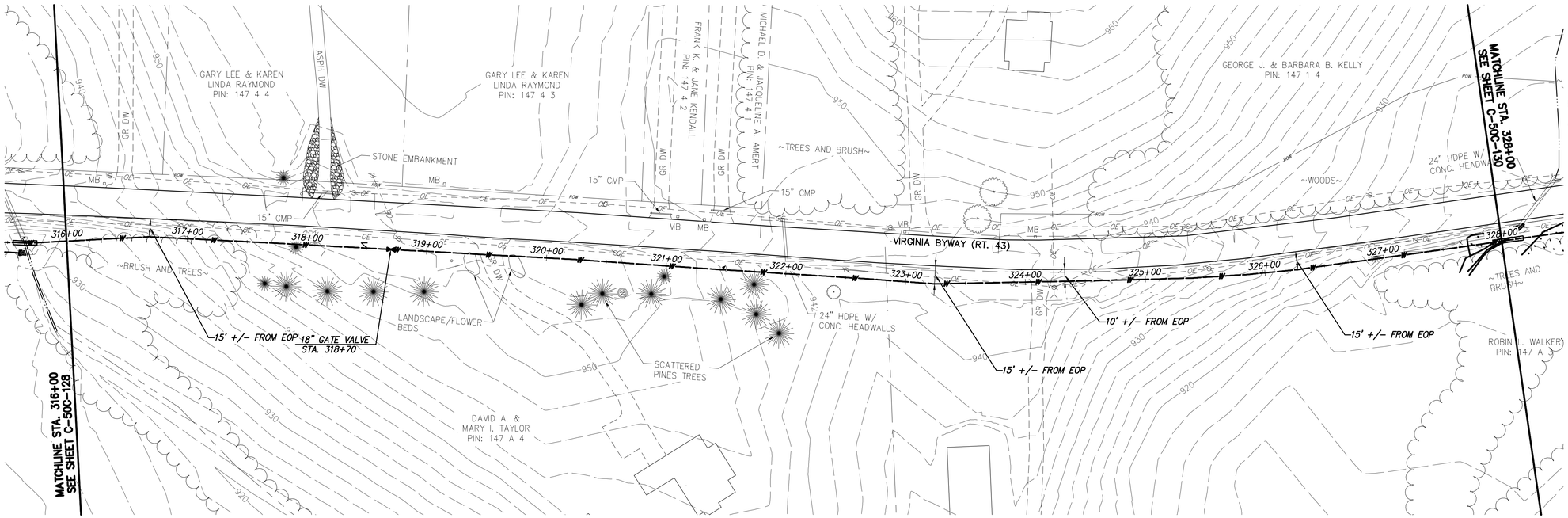
PROJECT NO.
27872

C-50C-128
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

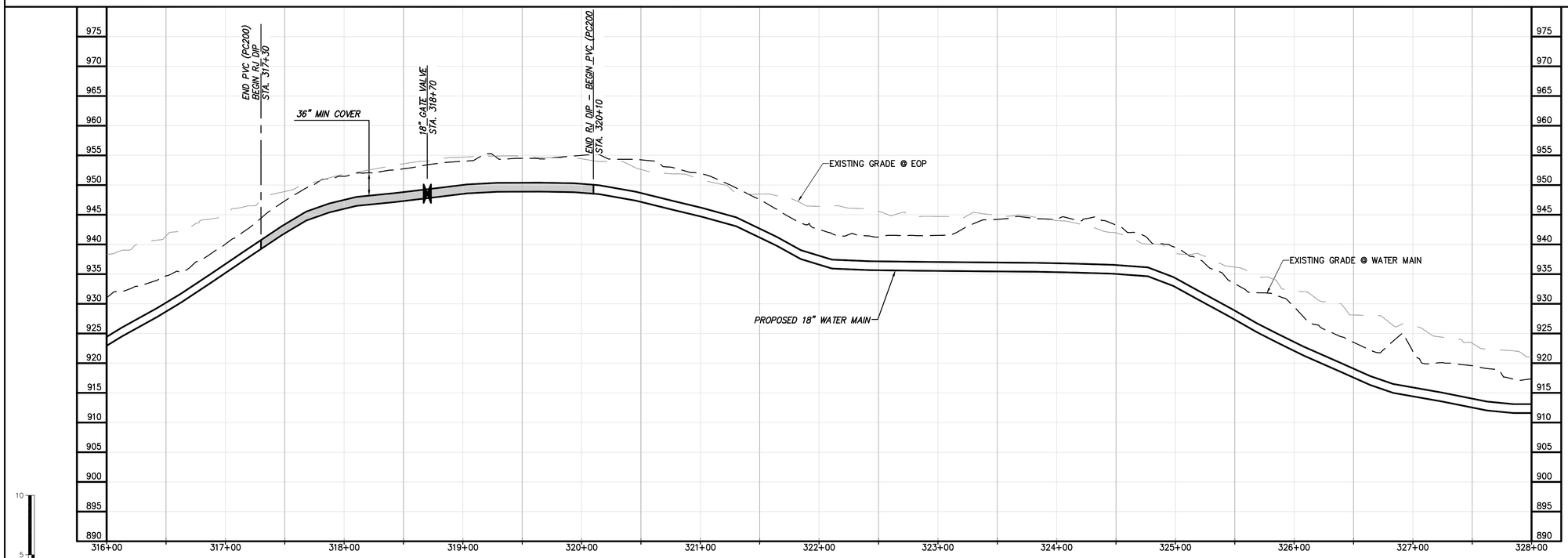
File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-125-129_27872.DWG
Saved: 6/4/2015 10:28:12 AM Plotted: 6/4/2015 12:53:30 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



0 50 100
Scale in feet

WATER MAIN PLAN



WATER MAIN PROFILE

10
5
0
0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:

DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

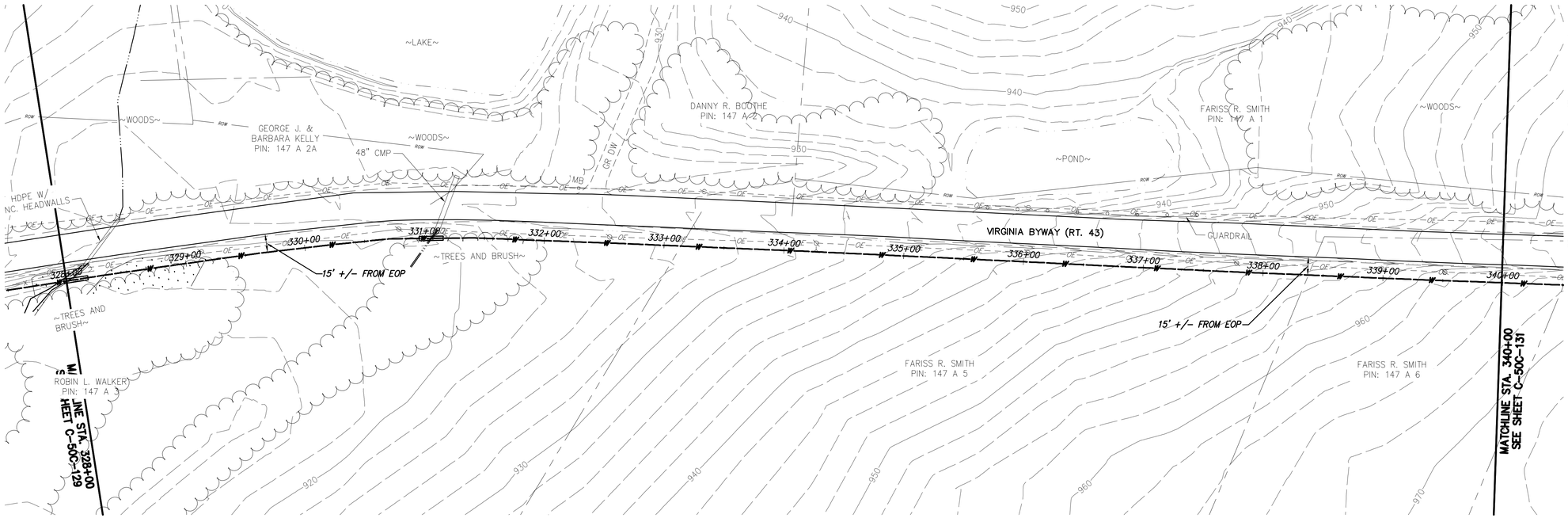
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

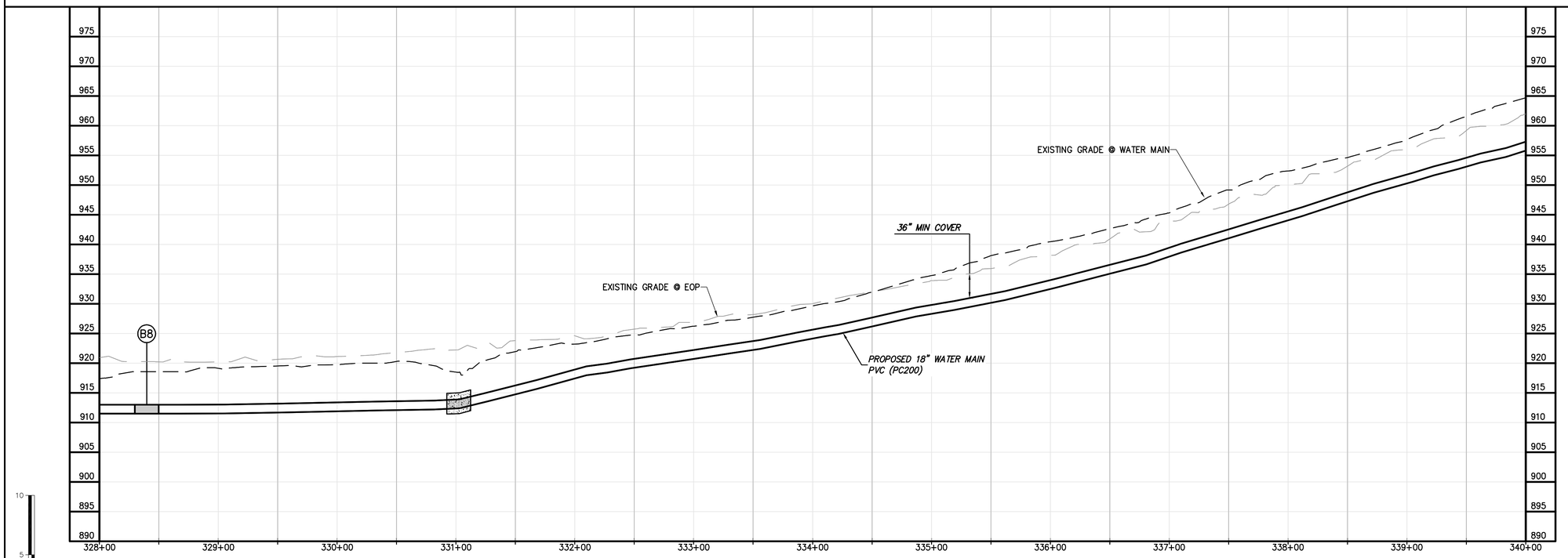
C-50C-129
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-125-129_27872.DWG
Saved: 6/4/2015 10:28:12 AM Plotted: 6/4/2015 12:54:20 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

0 50 100
Scale in feet

0 5 10
0 50 100
Scale in feet

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

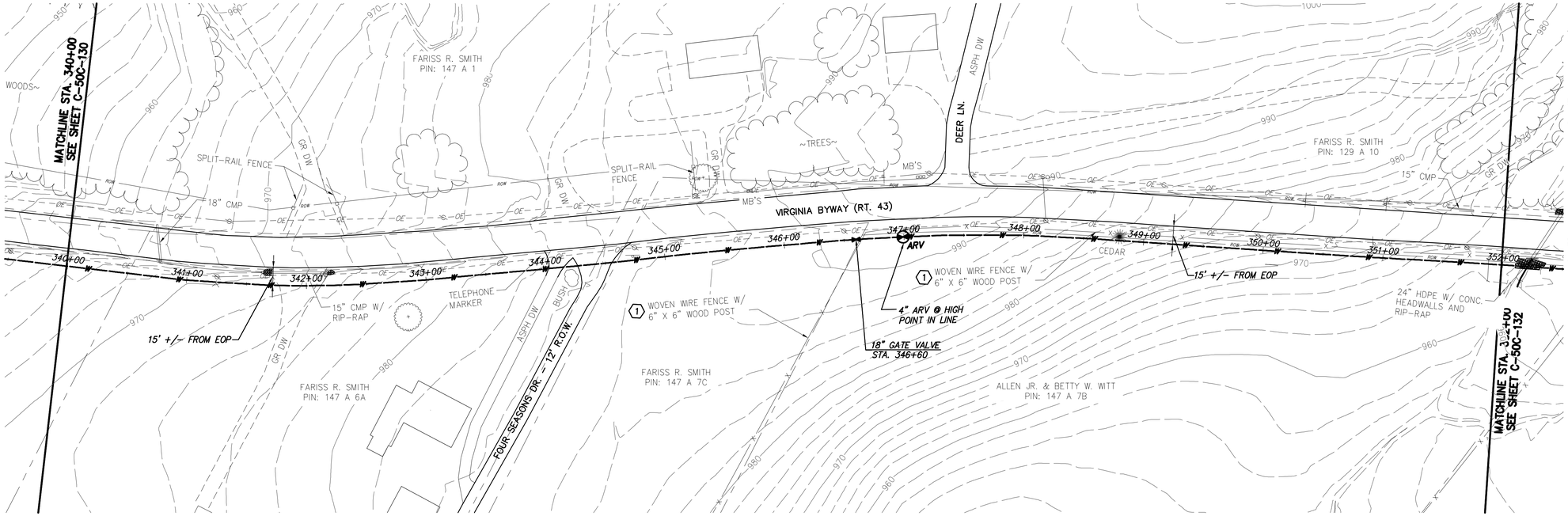
PROJECT NO.
27872

C-50C-130
SHEET
OF

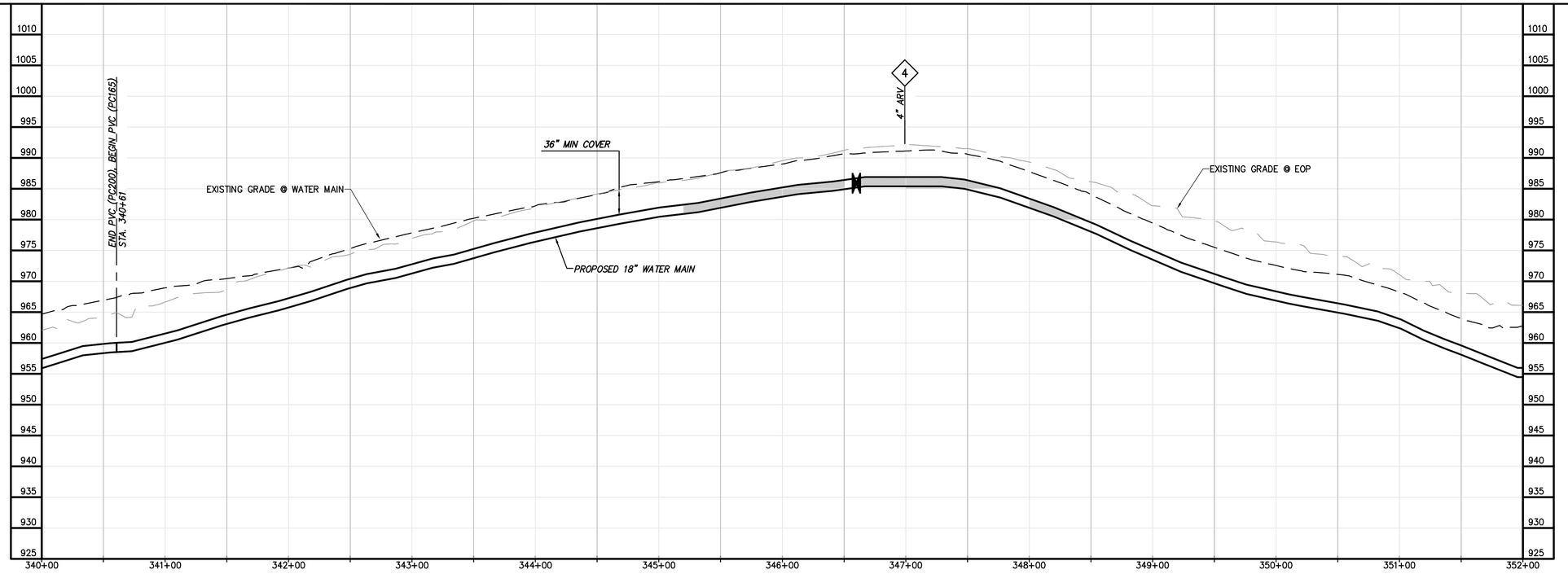
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-130-133_27872.DWG
Saved: 6/4/2015 10:28:43 AM Plotted: 6/4/2015 12:57:11 PM User: Miller, Gary LastSavedBy: 4646

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1. CONTRACTOR SHALL RELOCATE/REPLACE FENCE FROM APPROXIMATE STATION 346+50 TO STATION 356+00, TO BACK OF PERMANENT EASEMENT. PROPERTY SHALL REMAIN SECURE AT ALL TIMES.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

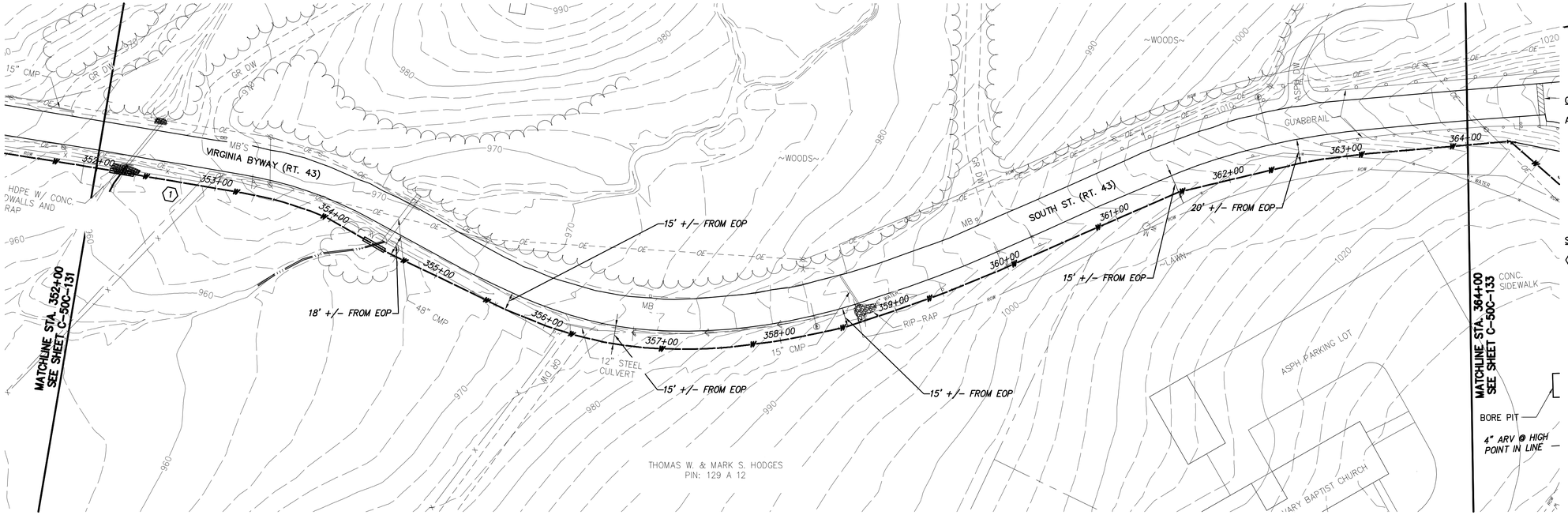
DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

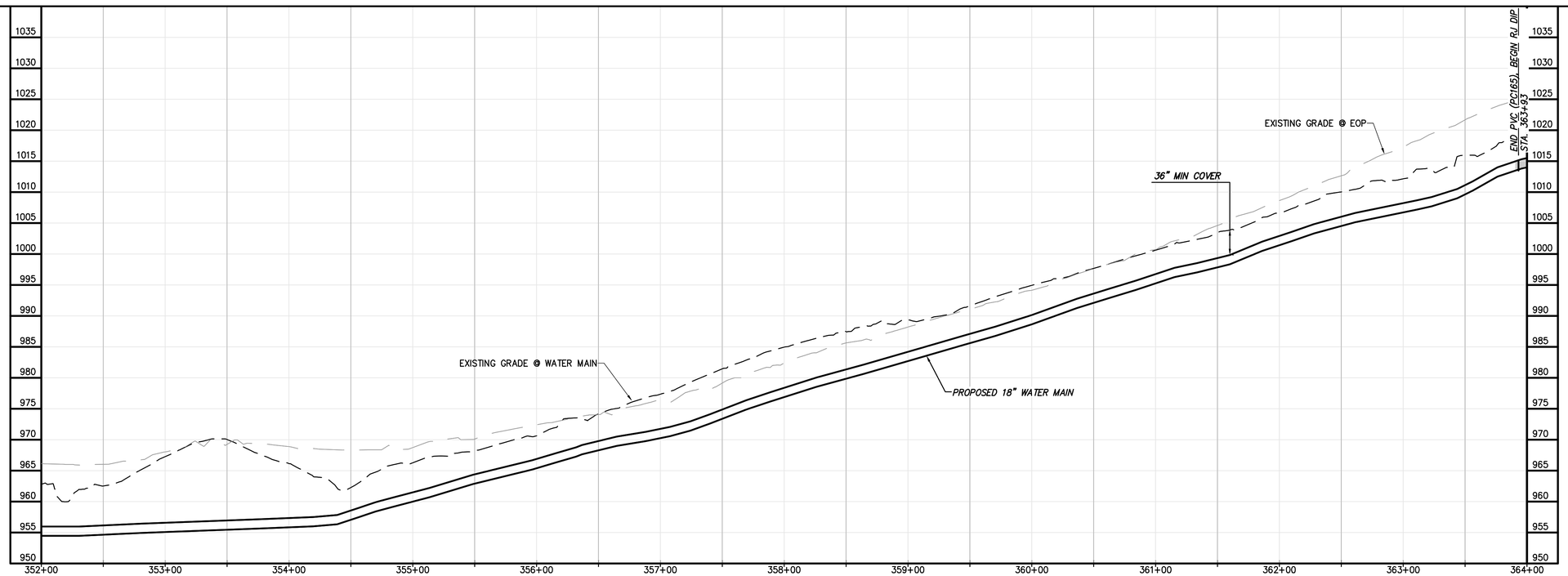
PROJECT NO.
27872

C-50C-131
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-130-133_27872.DWG
Saved: 6/4/2015 10:28:43 AM Plotted: 6/4/2015 12:58:00 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

0 5 10

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) CONTRACTOR SHALL RELOCATE/REPLACE FENCE FROM APPROXIMATE STATION 346+50 TO STATION 356+00, TO BACK OF PERMANENT EASEMENT. PROPERTY SHALL REMAIN SECURE AT ALL TIMES.

NO.	BY	CK	APP
	GLM	JRM	SMS
	GLM	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

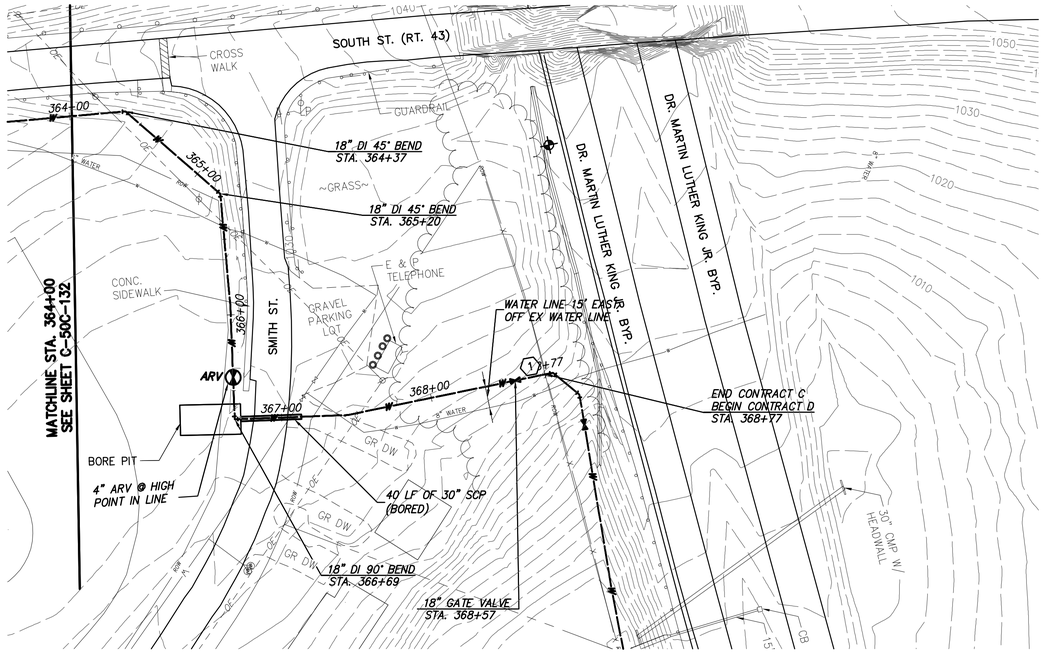
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

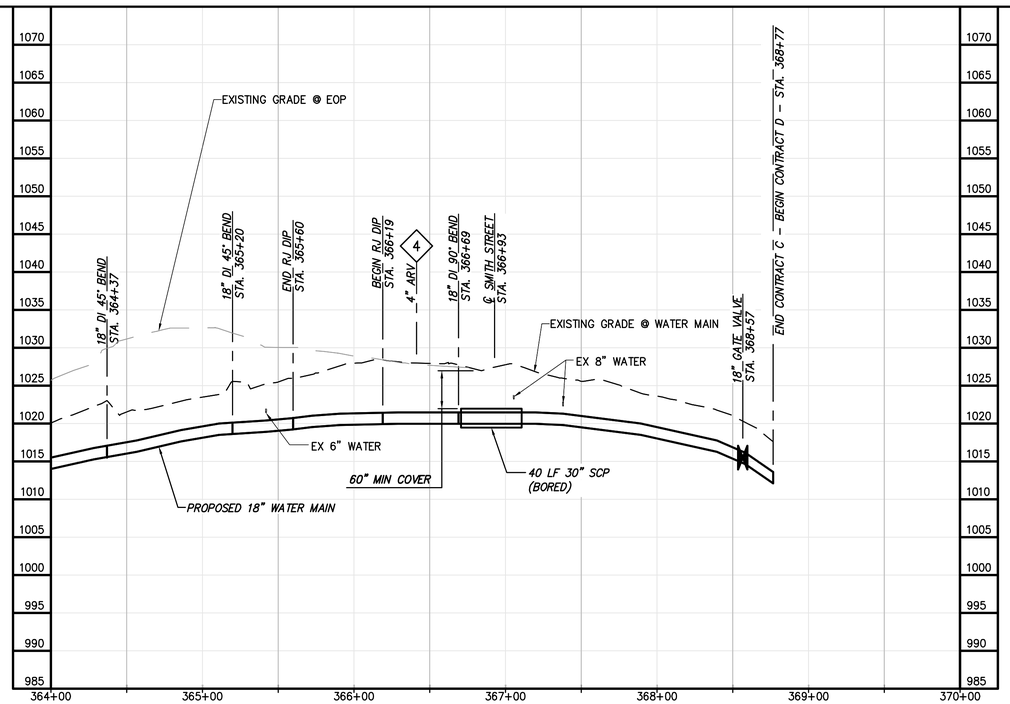
C-50C-132
SHEET
OF

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-130-133_27872.DWG
Saved: 6/4/2015 10:28:43 AM Plotted: 6/4/2015 12:58:49 PM User: Miller, Gary LastSavedBy: 4646

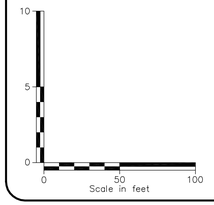
FD7000
D7000

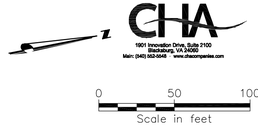


WATER MAIN PLAN



WATER MAIN PROFILE





GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COORDINATE TIE-IN AND TESTING WITH CONTRACTOR FOR CONTRACT D.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
	GLM	JRM	SMS	6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	GLM	JRM	SMS		LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT C WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: GLM
CHECKED: BSR
APPROVED: SMS
DATE:

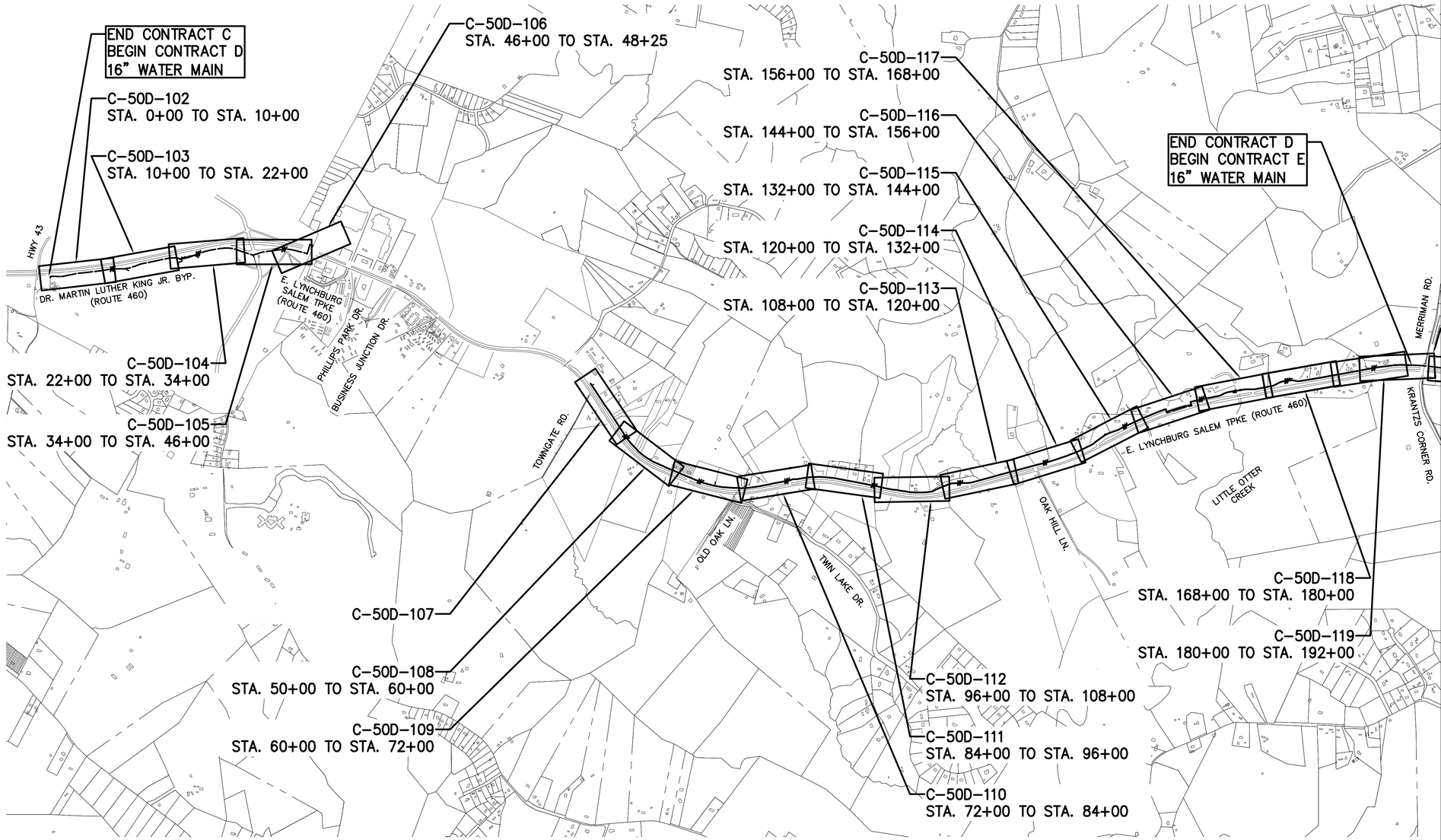
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50C-133
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\IN62\PROJ\27872\CADD_ACAD\C-50C-130-133_27872.DWG
Saved: 6/4/2015 10:28:43 AM Plotted: 6/4/2015 12:59:38 PM User: Miller, Gary LastSavedBy: 4646
FD7000
D7000



SITE PLAN
SCALE: 1" = 1000'

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C-50D-101	CONTRACT D – WATER MAIN KEY PLAN
C-50D-102	CONTRACT D WATER MAIN – PLAN AND PROFILE DR MARTIN LUTHER KING JR BYP (RT 460) STA. 0+00 TO STA. 10+00
C-50D-103	CONTRACT D WATER MAIN – PLAN AND PROFILE DR MARTIN LUTHER KING JR BYP (RT 460) STA. 10+00 TO STA. 22+00
C-50D-104	CONTRACT D WATER MAIN – PLAN AND PROFILE DR MARTIN LUTHER KING JR BYP (RT 460) STA. 22+00 TO STA. 34+00
C-50D-105	CONTRACT D WATER MAIN – PLAN AND PROFILE DR MARTIN LUTHER KING JR BYP (RT 460) STA. 34+00 TO STA. 46+00
C-50D-106	CONTRACT D WATER MAIN – PLAN AND PROFILE DR MARTIN LUTHER KING JR BYP (RT 460) STA. 46+00 TO STA. 48+25
C-50D-107	CONTRACT D EXISTING WATER MAIN – PLAN
C-50D-108	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 50+00 TO STA. 60+00
C-50D-109	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 60+00 TO STA. 72+00
C-50D-110	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 72+00 TO STA. 84+00
C-50D-111	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 84+00 TO STA. 96+00
C-50D-112	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 96+00 TO STA. 108+00
C-50D-113	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 108+00 TO STA. 120+00
C-50D-114	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 120+00 TO STA. 132+00
C-50D-115	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 132+00 TO STA. 144+00
C-50D-116	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 144+00 TO STA. 156+00
C-50D-117	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 156+00 TO STA. 168+00
C-50D-118	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 168+00 TO STA. 180+00
C-50D-119	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 180+00 TO STA. 192+00
C-50D-120	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 192+00 TO STA. 204+00
C-50D-121	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 204+00 TO STA. 216+00
C-50D-122	CONTRACT D WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPK (RT 460) STA. 216+00 TO STA. 224+61

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0438 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE: 6/4/2015
LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D - WATER MAIN KEY PLAN

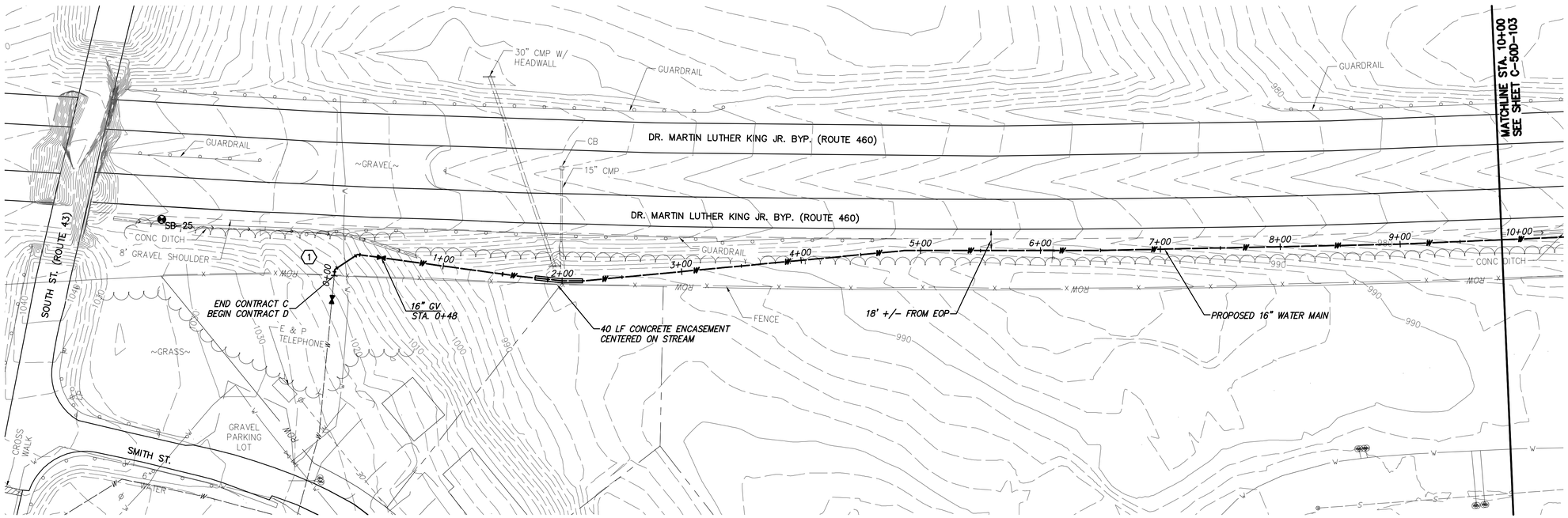
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

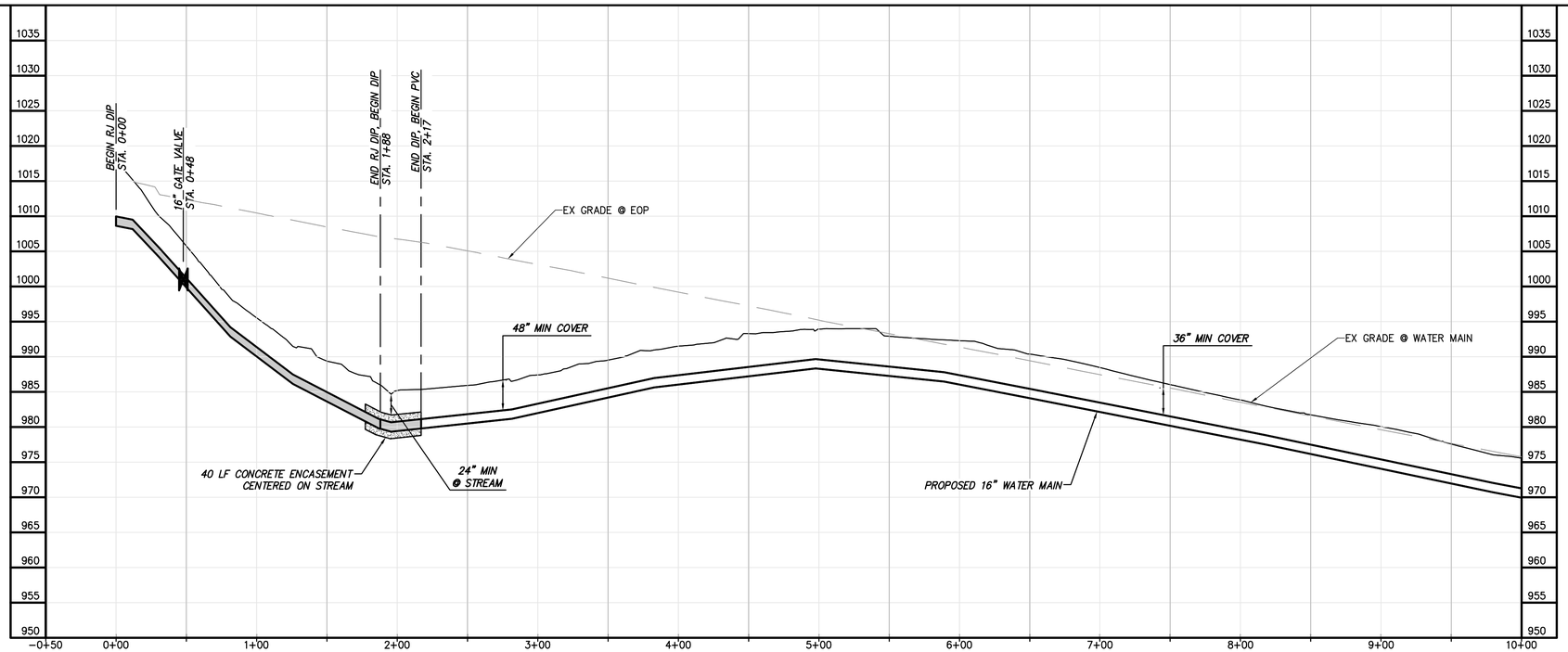
PROJECT NO.
27872

C-50D-101
SHEET
OF

File: V:\PROJECTS\ANYVK3\27872\CADD_ACAD\C-50D-101_27872.DWG
Saved: 6/4/2015 10:27:08 AM Plotted: 6/4/2015 10:59:20 AM User: Parks, Sarah LastSavedBy: 5415
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5548 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

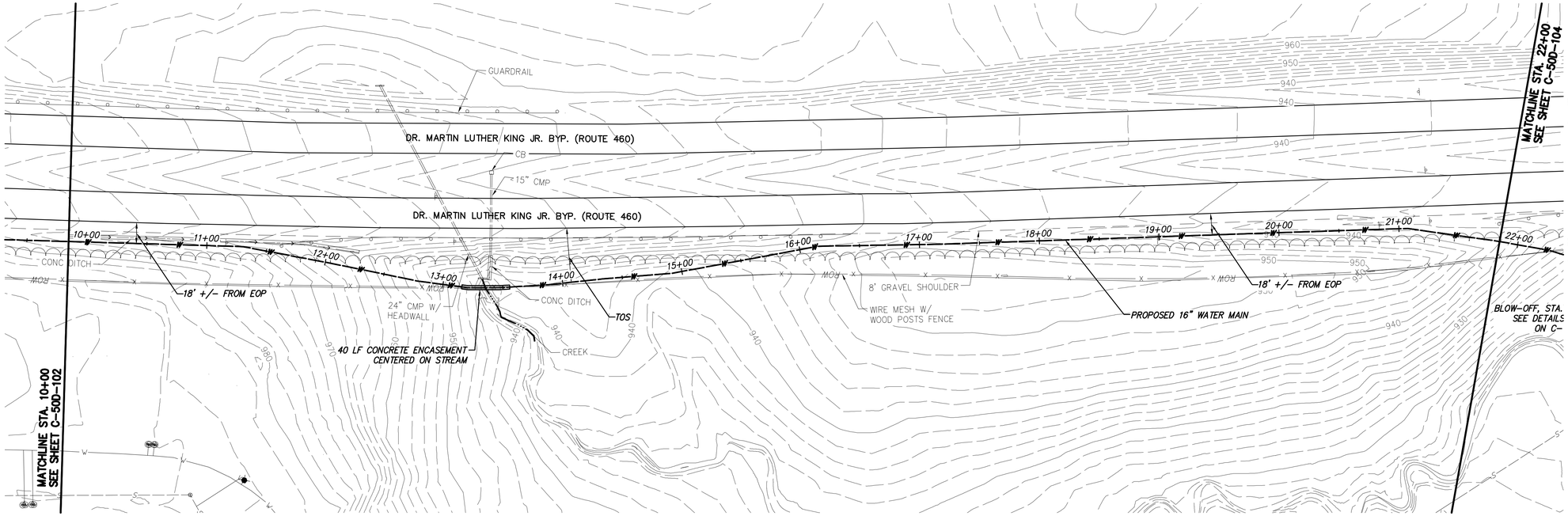
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

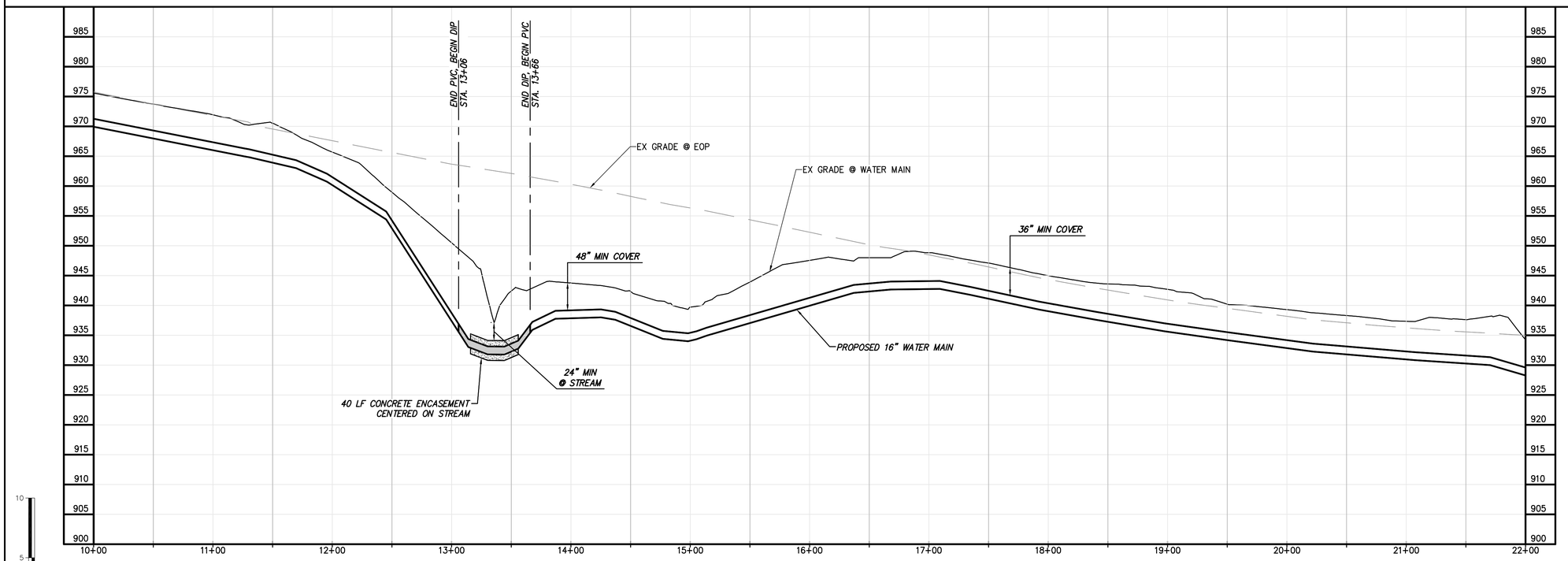
C-50D-102
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50D-102-106_27872.DWG
Saved: 6/4/2015 7:20:00 AM Plotted: 6/4/2015 11:00:44 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

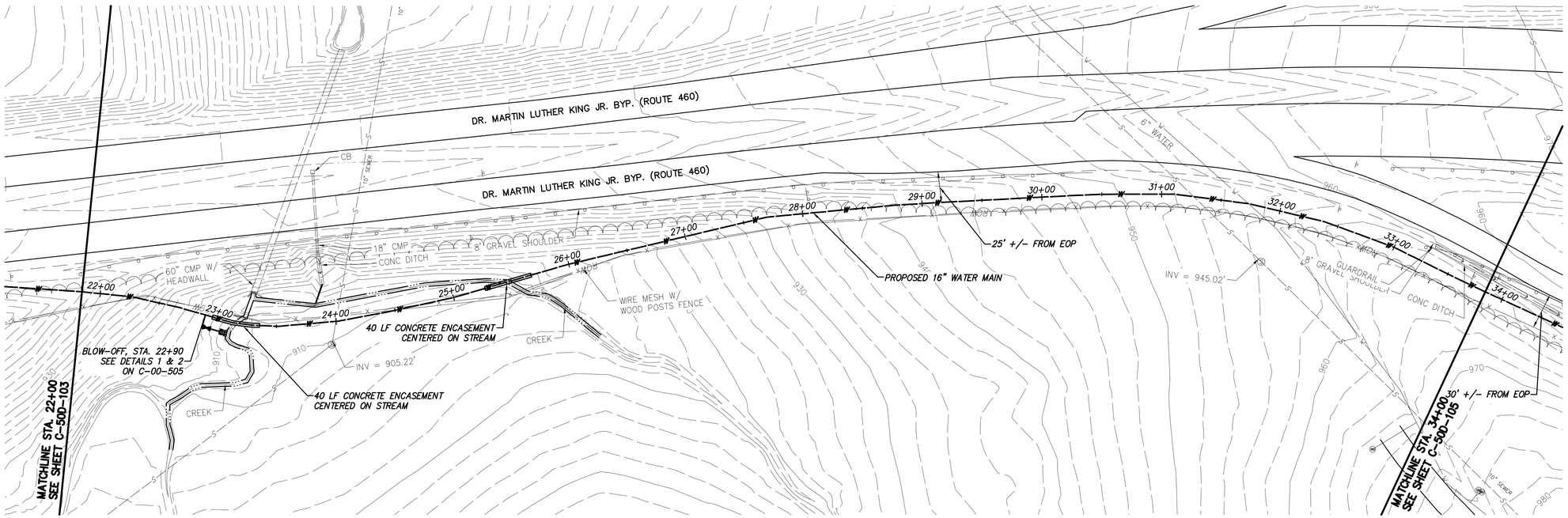
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

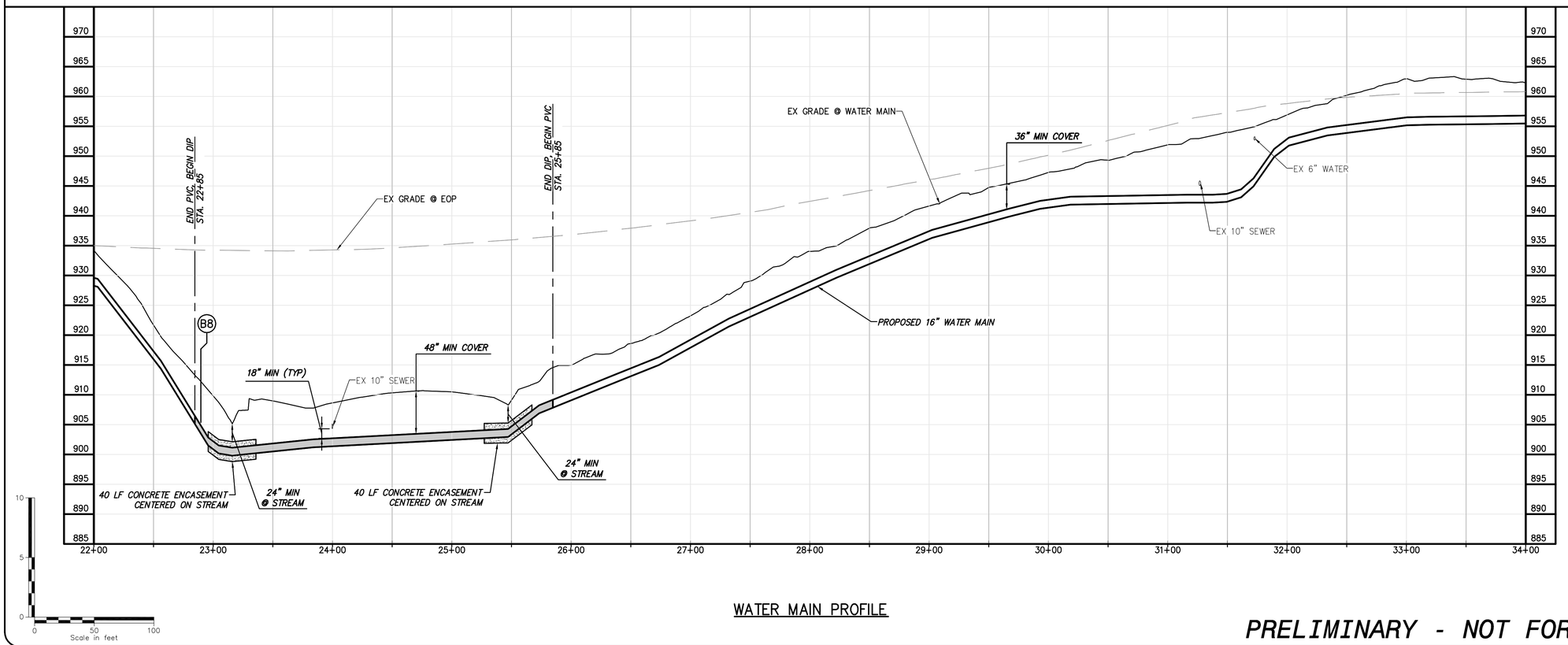
C-50D-103
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50D-102-106_27872.DWG
Saved: 6/4/2015 7:20:00 AM Plotted: 6/4/2015 11:01:19 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
6/4/2015
DATE

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

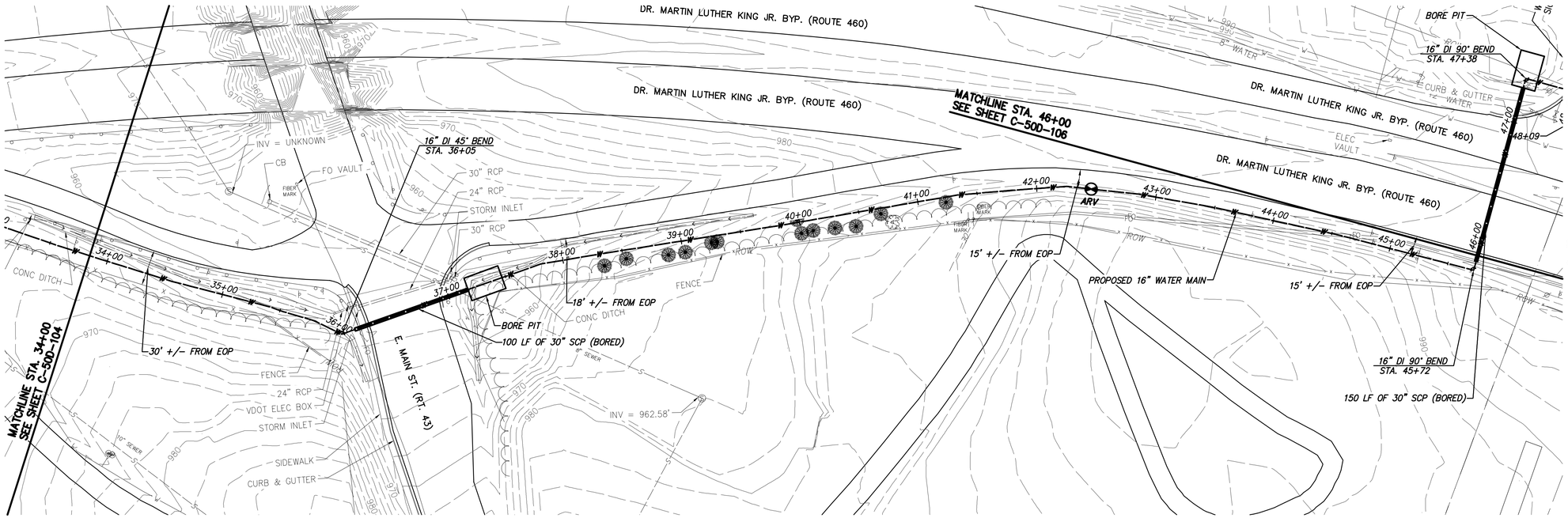
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

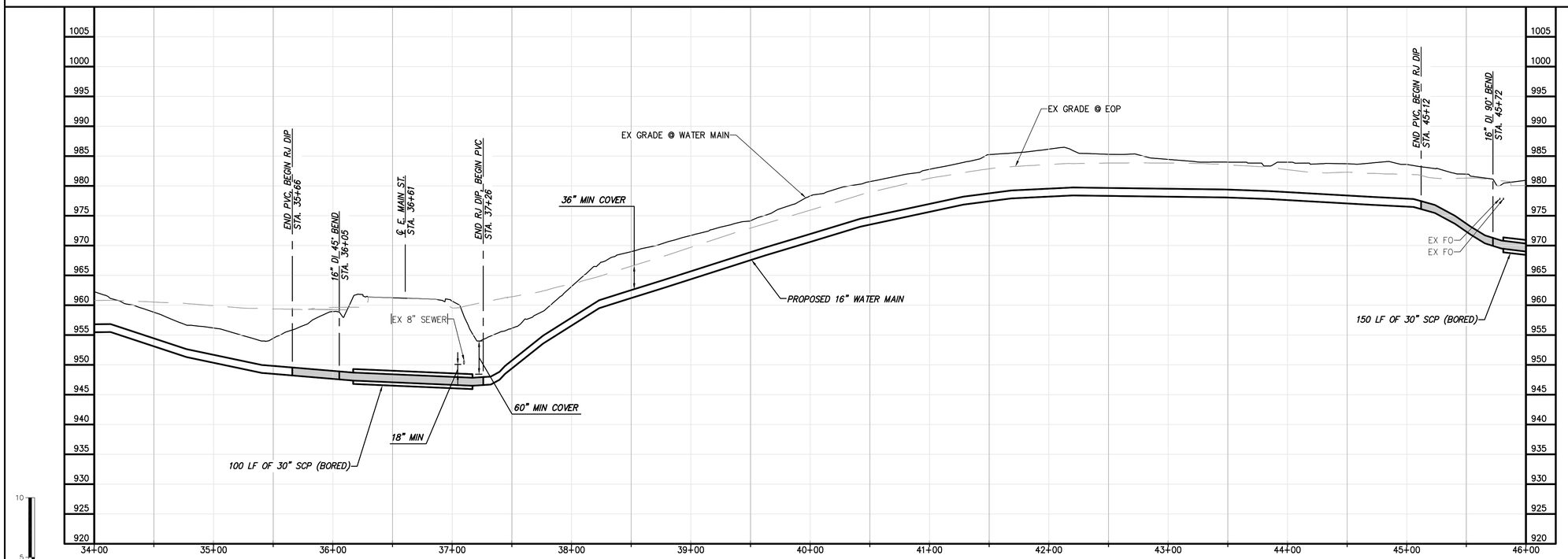
PROJECT NO.
27872

C-50D-104
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50D-102-106_27872.DWG
Saved: 6/4/2015 7:20:00 AM Plotted: 6/4/2015 11:01:56 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

Scale in feet: 0, 50, 100

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

DATE	LEVEL 2 DESIGN DOCUMENTS	LEVEL 3 DESIGN DOCUMENTS
6/4/2015		

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

SAVED:
PLOTTED:
USER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

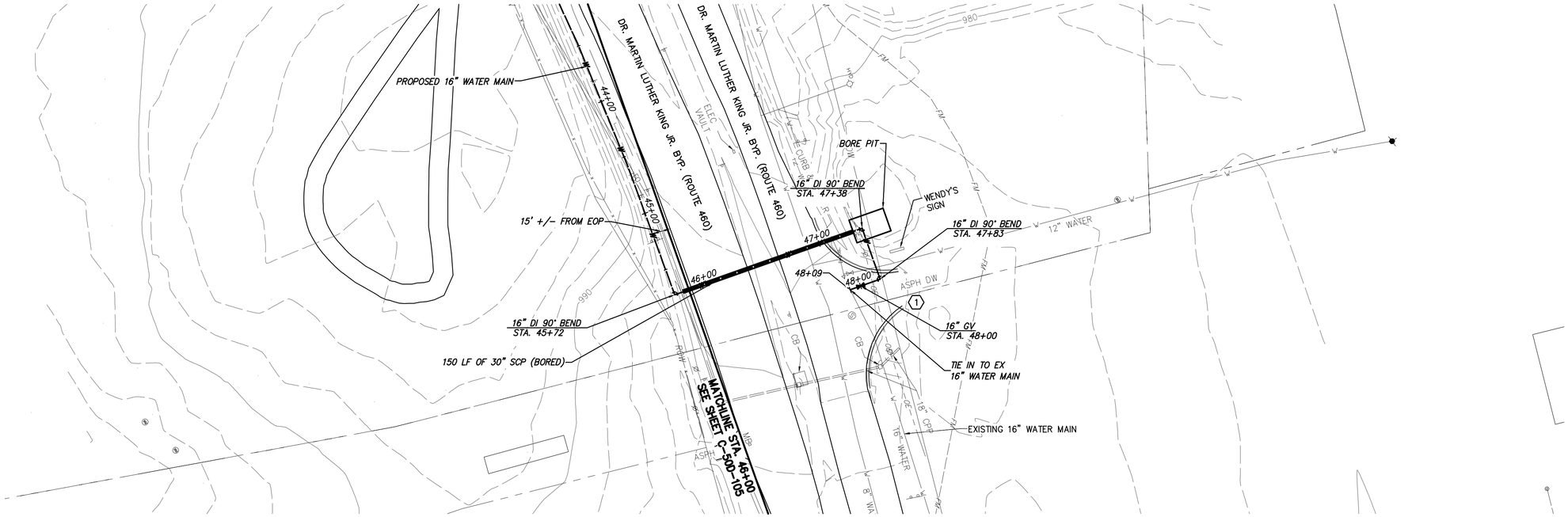
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

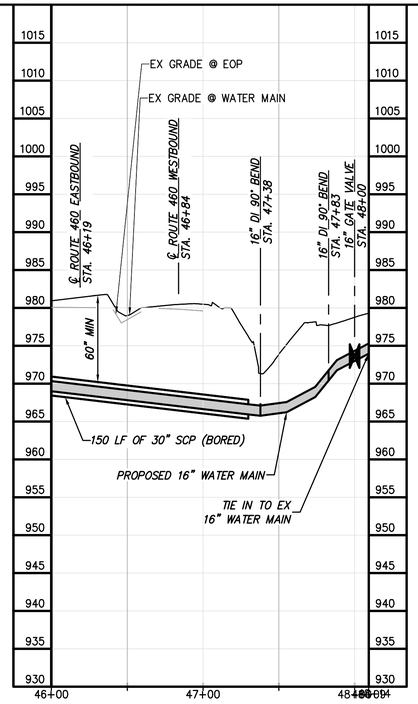
C-50D-105
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

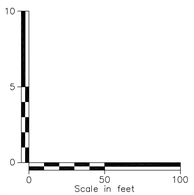
File: V:\PROJECTS\VA\Y\K3\27872\CADD_ACAD\C-50D-102-106_27872.DWG
Saved: 6/4/2015 7:20:00 AM Plotted: 6/4/2015 11:02:32 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE



GENERAL NOTES:

A.

SPECIFIC NOTES

(1) COORDINATE TIE-IN TO EX LINE WITH BRWA.

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

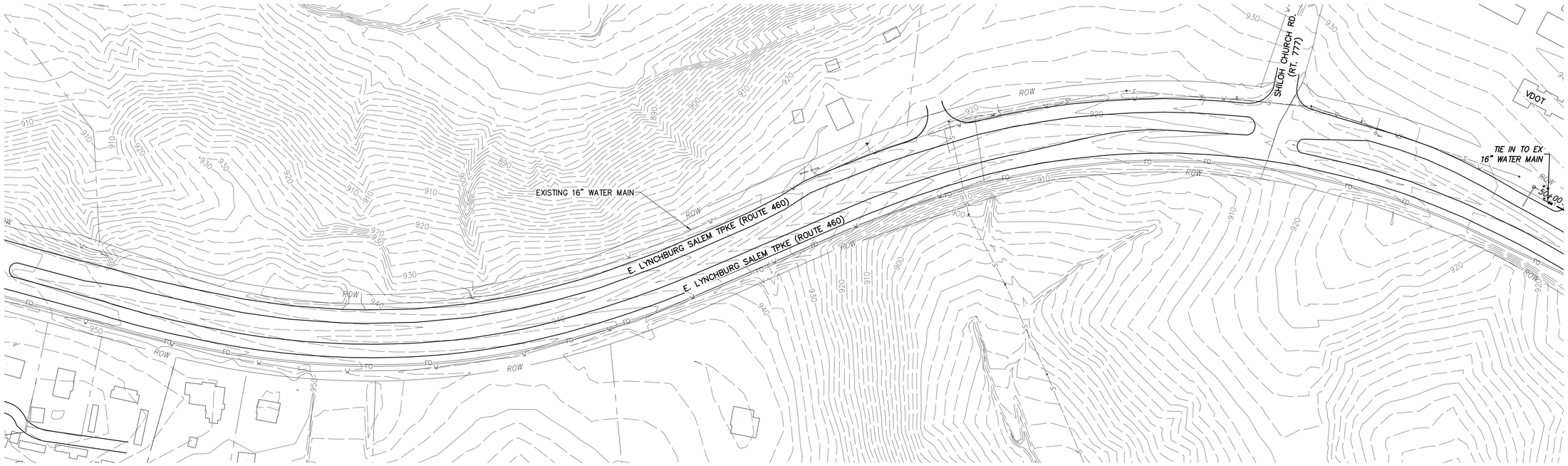
C-50D-106
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50D-102-106_27872.DWG
Saved: 6/4/2015 7:20:00 AM Plotted: 6/4/2015 11:03:09 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



EXISTING WATER MAIN PLAN



EXISTING WATER MAIN PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 100 200
Scale in feet

GENERAL NOTES:

A. THIS DRAWING OF BRWA EXISTING 16" WL & CONTRACT D TIE-INS TO SAME IS PROVIDED FOR INFORMATION ONLY.

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D EXISTING WATER MAIN - PLAN

DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

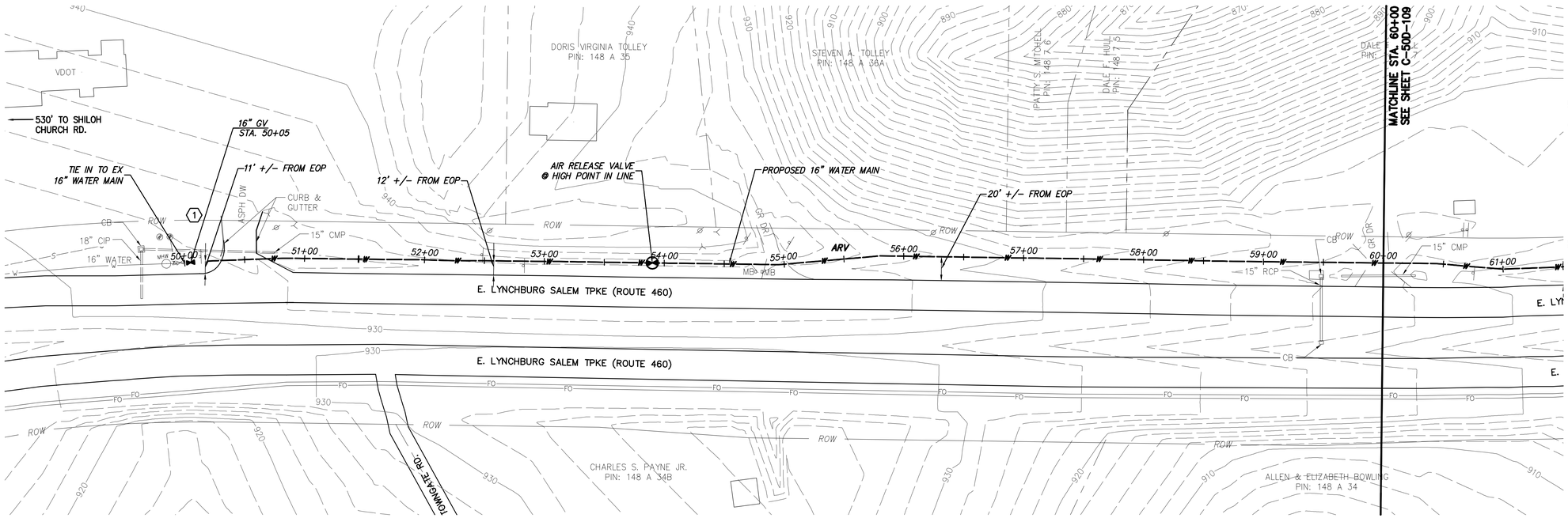
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

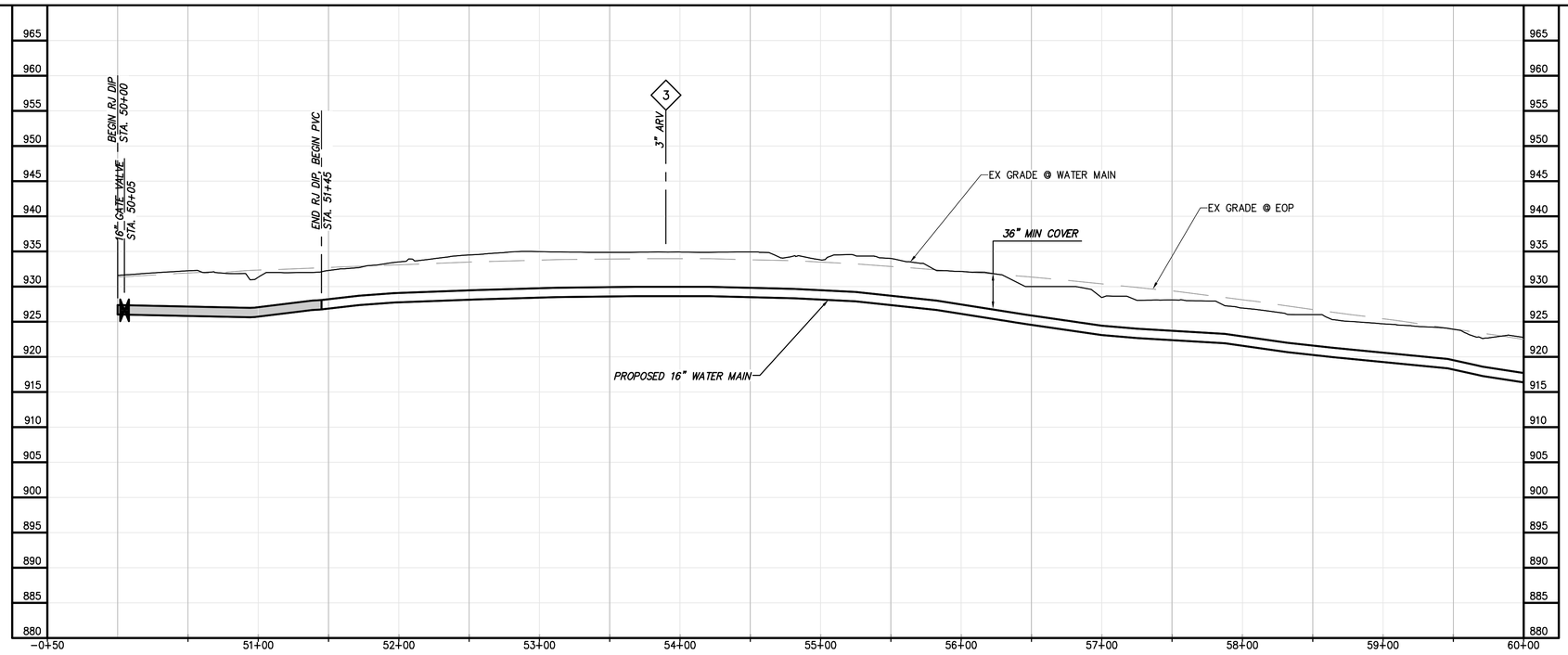
C-50D-107
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50D-107_27872.DWG
Saved: 6/4/2015 7:23:18 AM Plotted: 6/4/2015 11:04:26 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE			
LEVEL 2 DESIGN DOCUMENTS		SNP	JRM
LEVEL 3 DESIGN DOCUMENTS		SNP	JRM
DATE			SMS
6/4/2015			

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

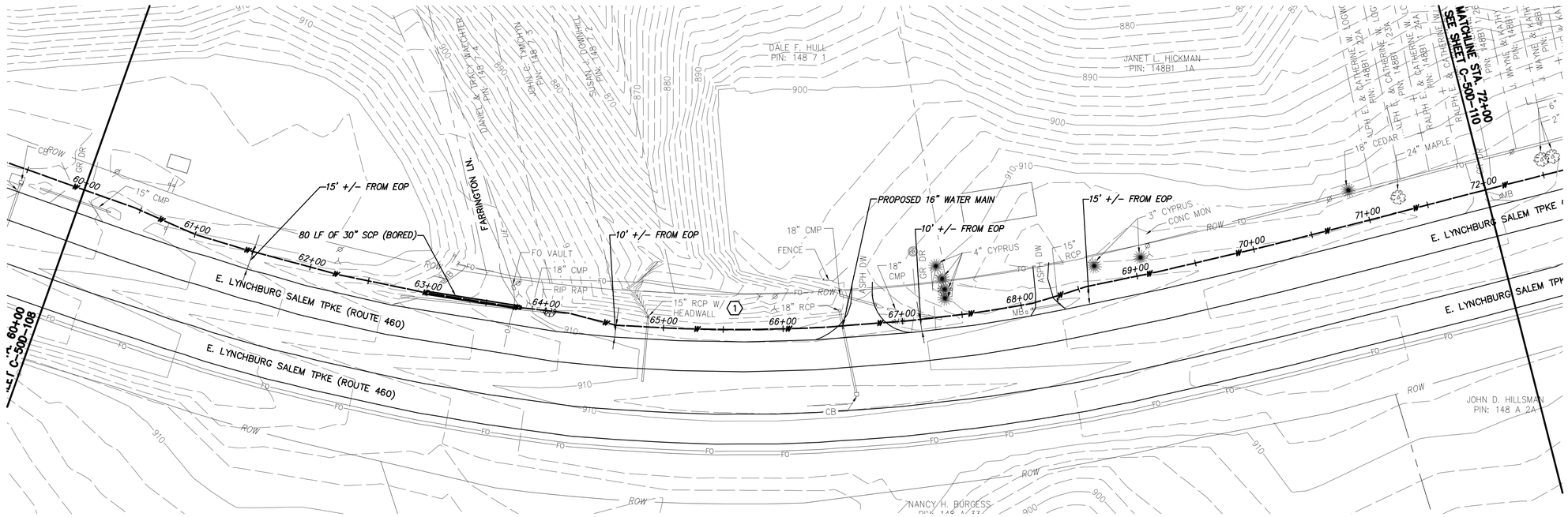
PROJECT NO.
27872

C-50D-108
SHEET
OF

10 5 0
0 50 100
Scale in feet

File: V:\PROJECTS\VAV\X3\27872\CADD_ACAD\C-50D-108-112_27872.DWG
Saved: 6/4/2015 7:24:04 AM Plotted: 6/4/2015 11:05:37 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



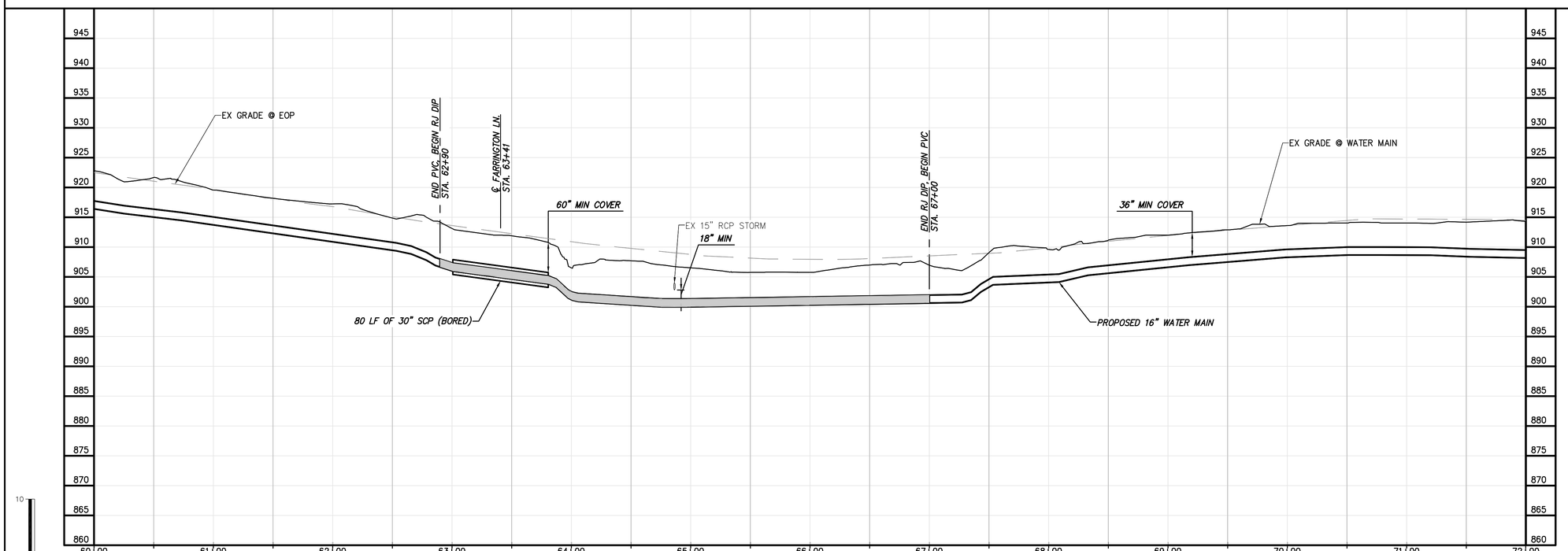
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS 6/4/2015

LEVEL 3 DESIGN DOCUMENTS

DATE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

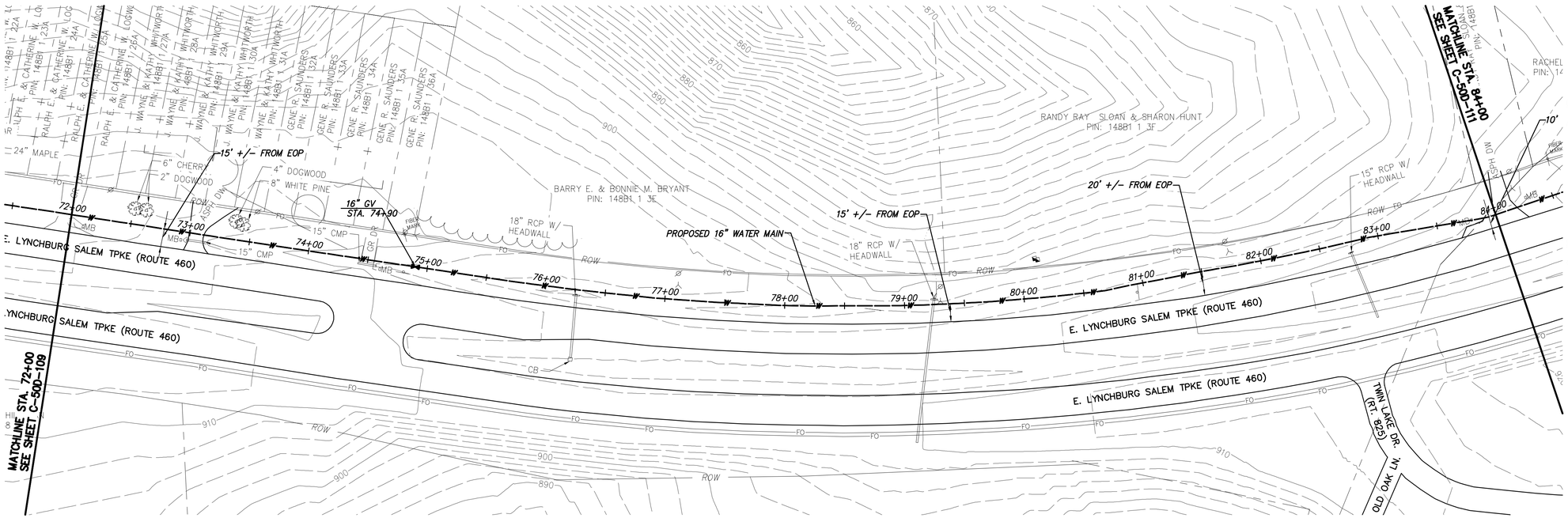
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

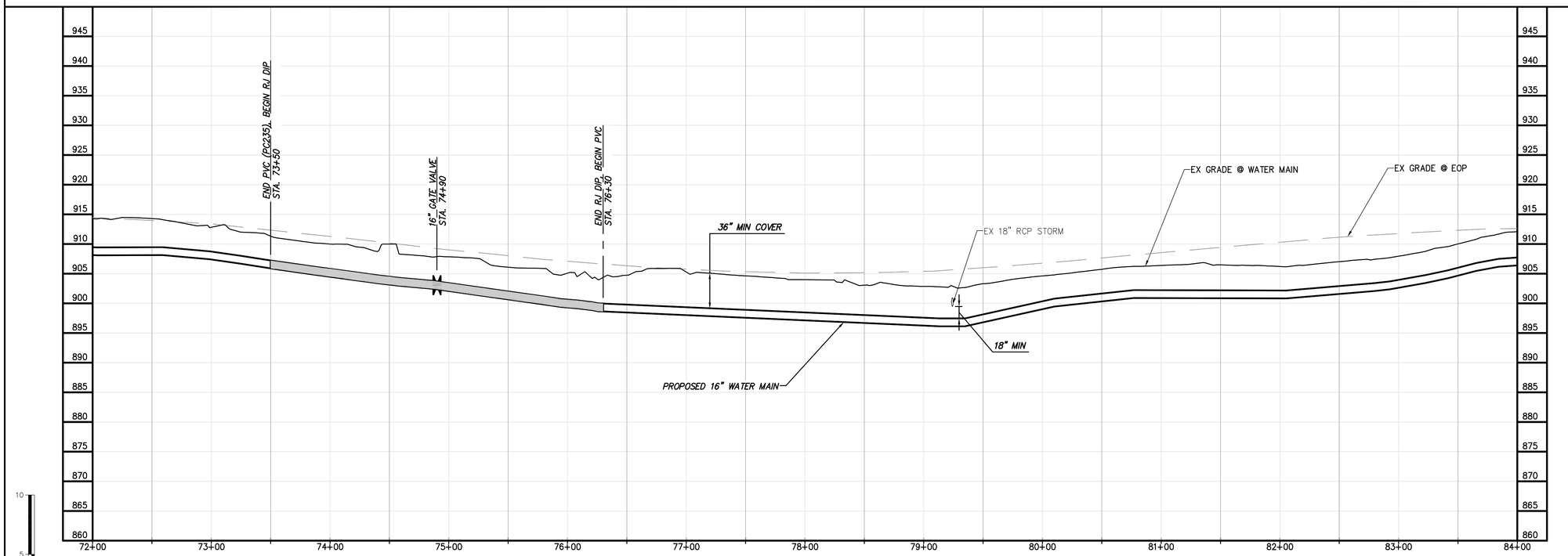
PROJECT NO.
27872

C-50D-109
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-500-108-112_27872.DWG
Saved: 6/4/2015 7:24:04 AM Plotted: 6/4/2015 11:06:13 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

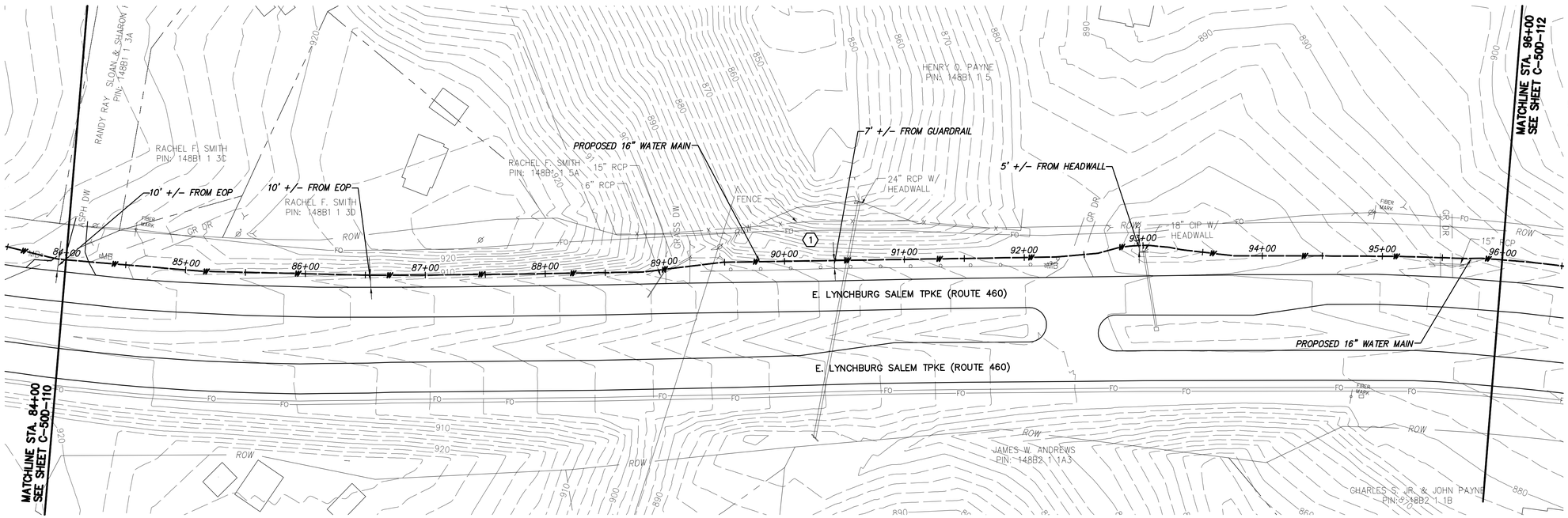
DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

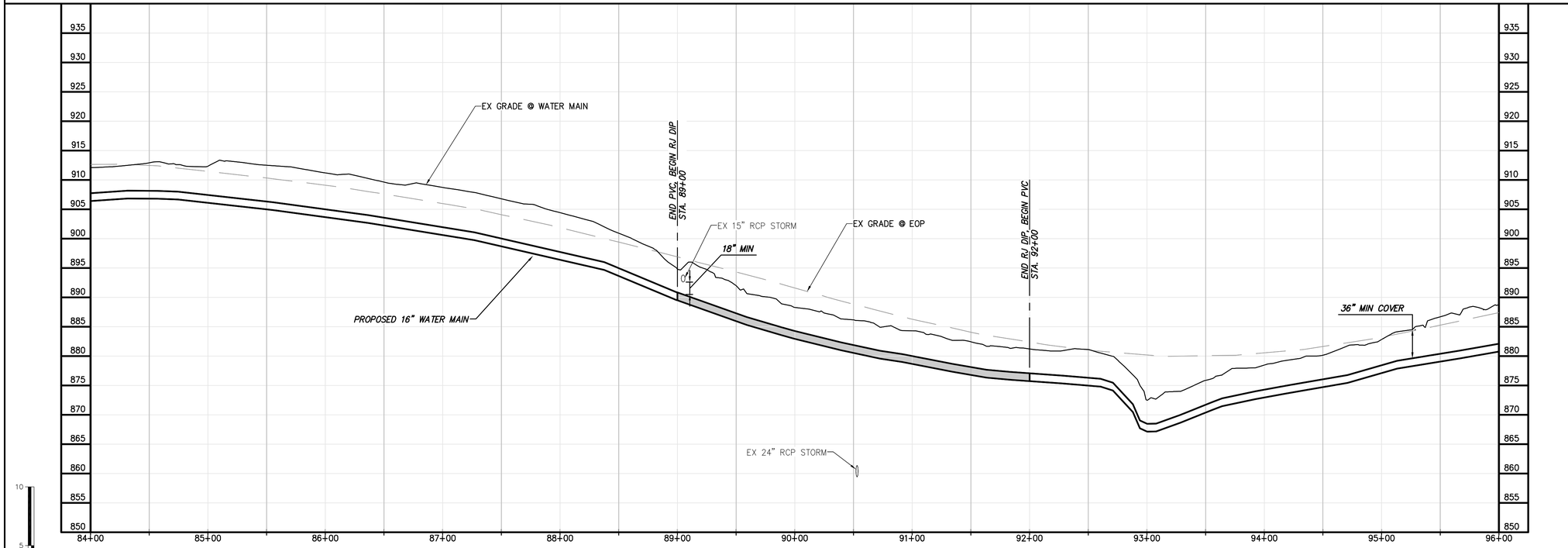
PROJECT NO.
27872

C-50D-110
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-108-112_27872.DWG
Saved: 6/4/2015 7:24:04 AM Plotted: 6/4/2015 11:06:49 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
6/4/2015	LEVEL 3 DESIGN DOCUMENTS		SNP	JRM	SMS
	LEVEL 2 DESIGN DOCUMENTS		SNP	JRM	SMS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

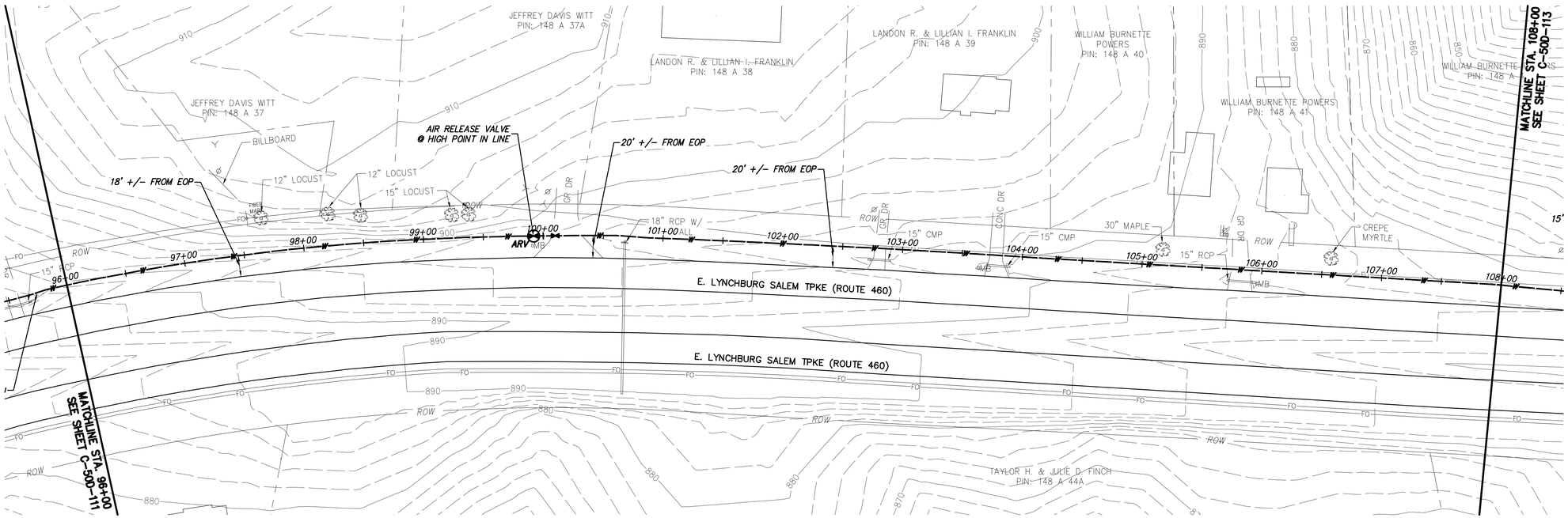
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

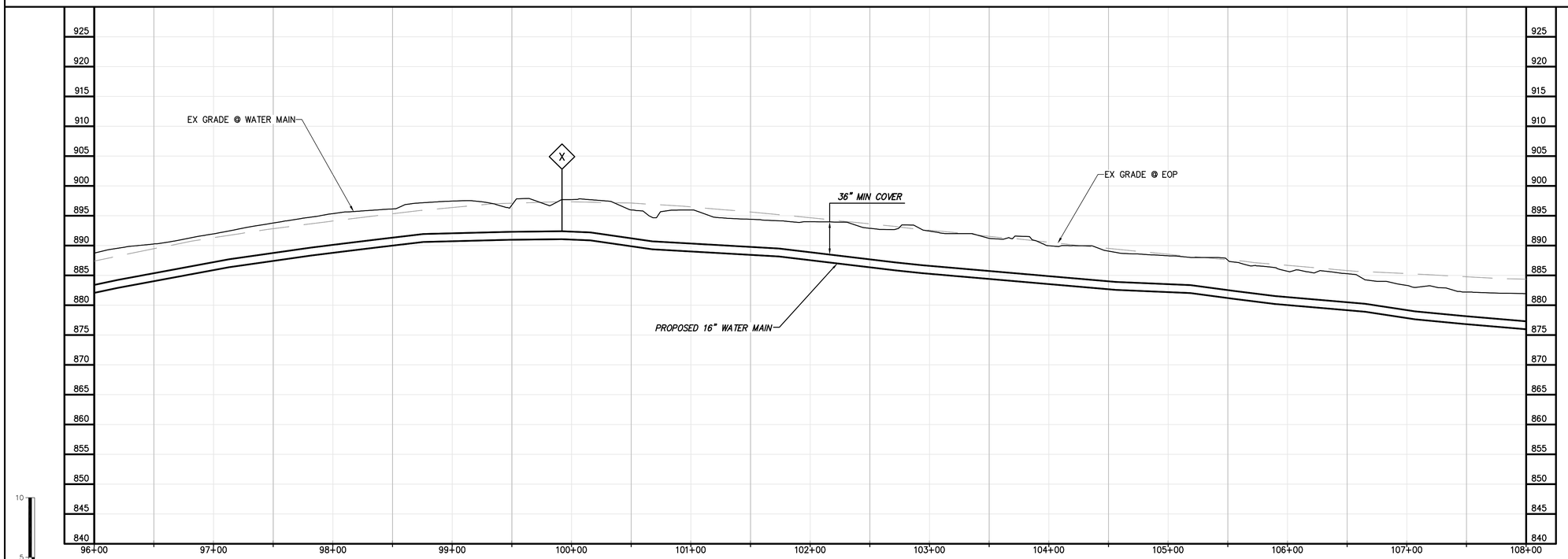
PROJECT NO.
27872

C-50D-111
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50D-108-112_27872.DWG
Saved: 6/4/2015 7:24:04 AM Plotted: 6/4/2015 11:07:25 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK. APP
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM SMS
LEVEL 3 DESIGN DOCUMENTS	SNP	JRM SMS
REVISIONS AND RECORD OF ISSUE		
DATE		
6/4/2015		

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

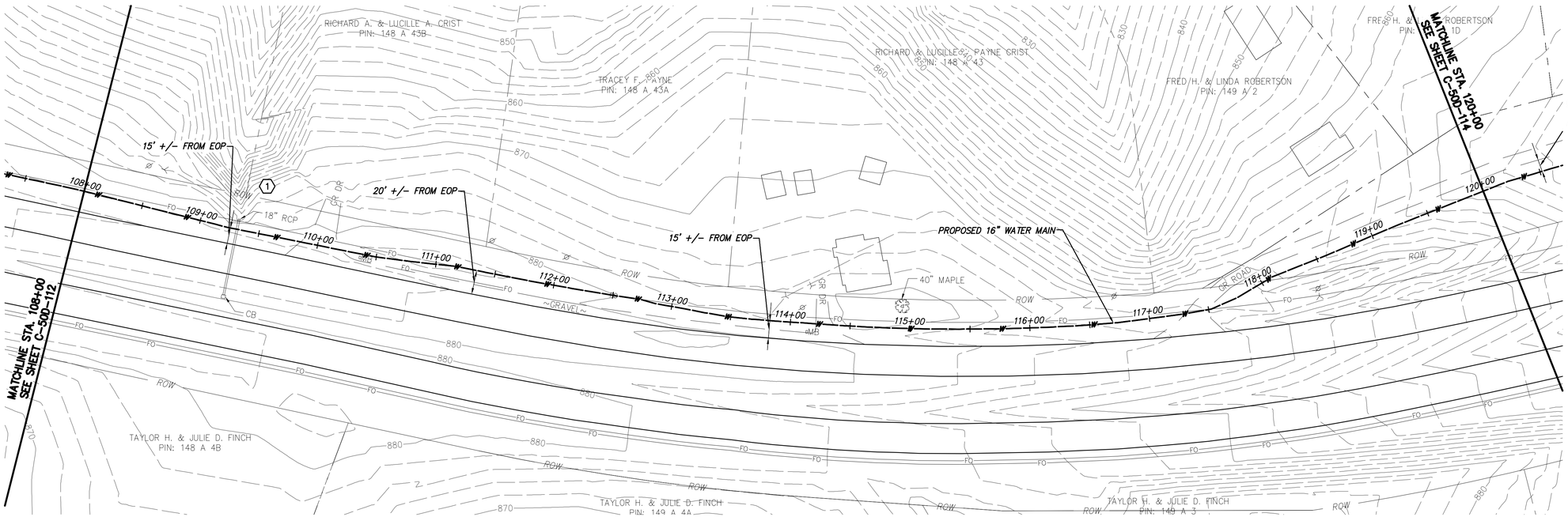
DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

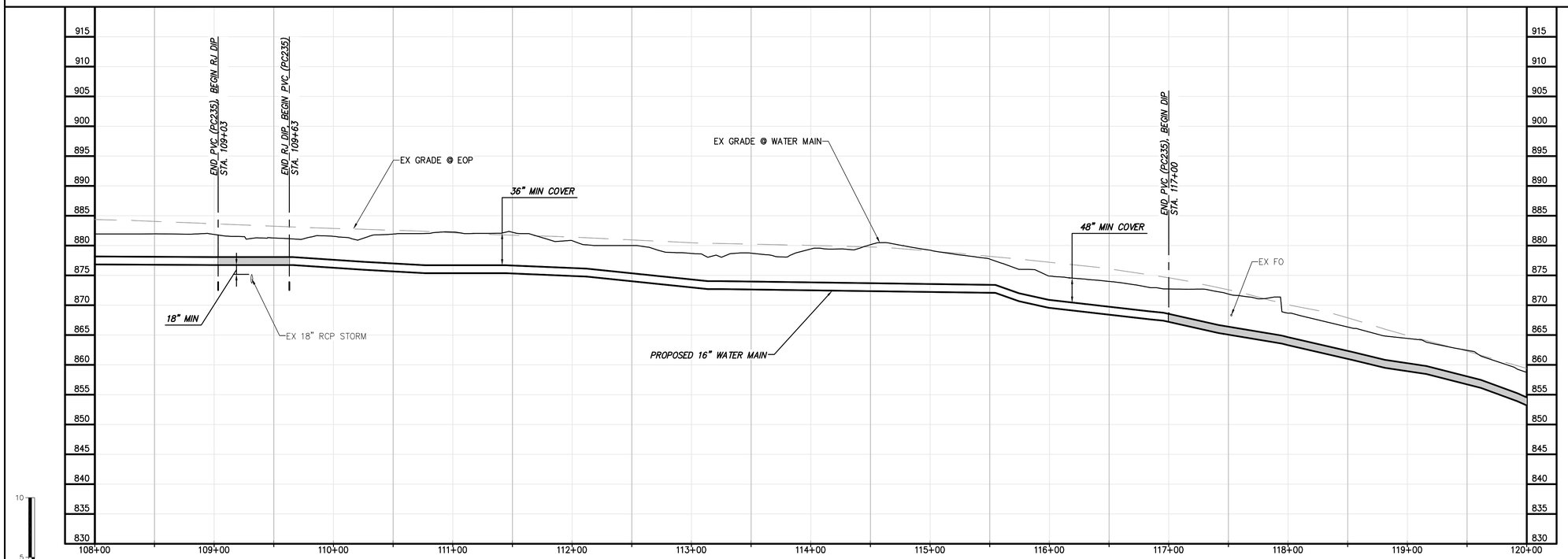
PROJECT NO.
27872

C-50D-112
SHEET
OF

File: V:\PROJECTS\VAV\X3\27872\CADD_ACAD\C-50D-108-112_27872.DWG
Saved: 6/4/2015 7:24:04 AM Plotted: 6/4/2015 11:08:02 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

Scale in feet: 0 50 100

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

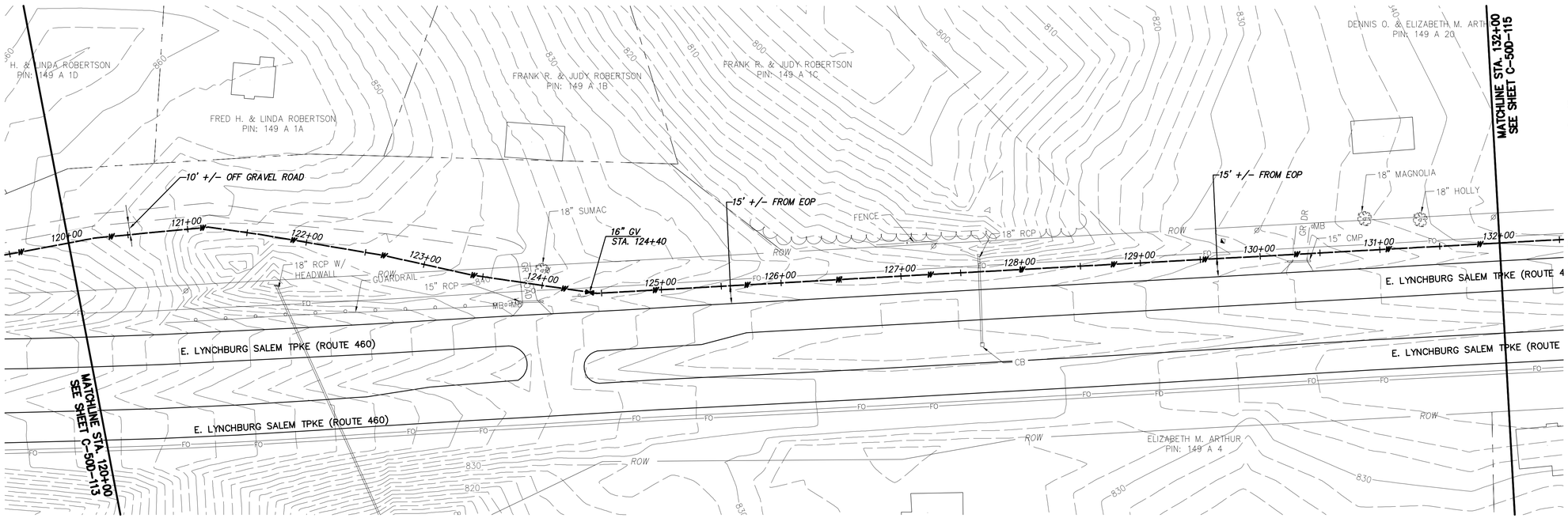
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50D-113
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-113-117_27872.DWG
Saved: 6/4/2015 7:24:41 AM Plotted: 6/4/2015 11:09:14 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



GENERAL NOTES:

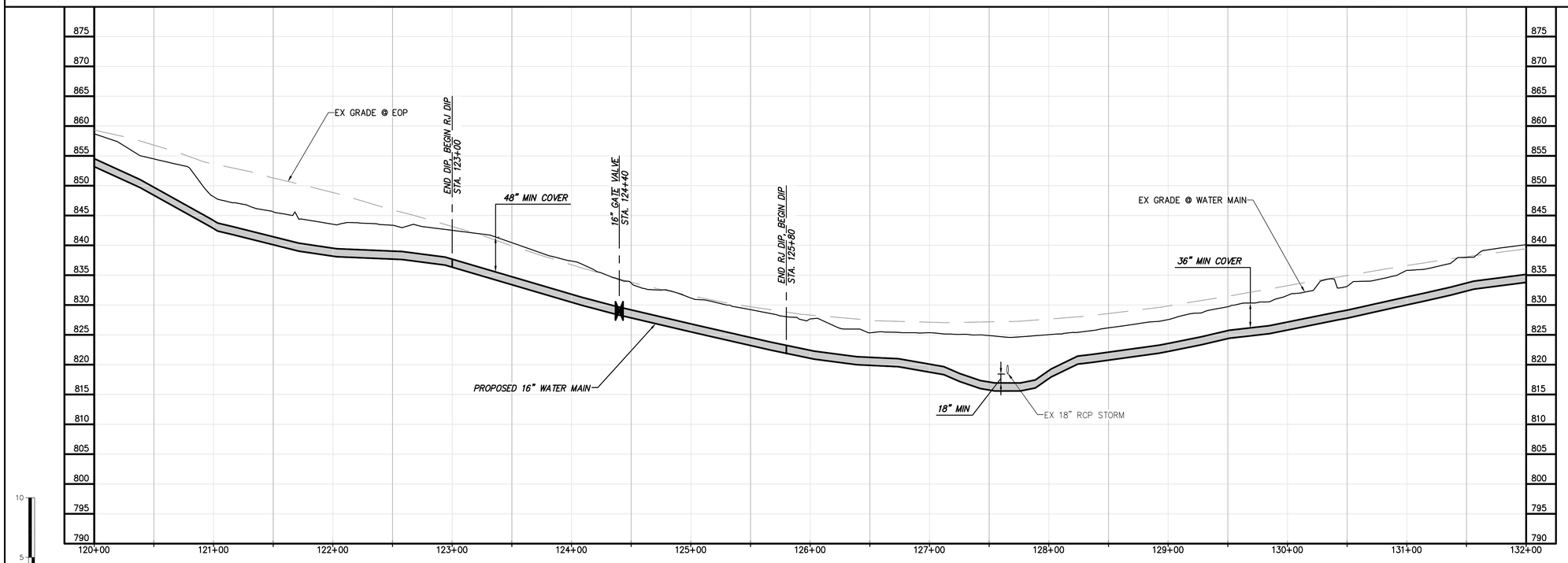
A.

SPECIFIC NOTES

(1) ____

0 50 100
Scale in feet

WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:

DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

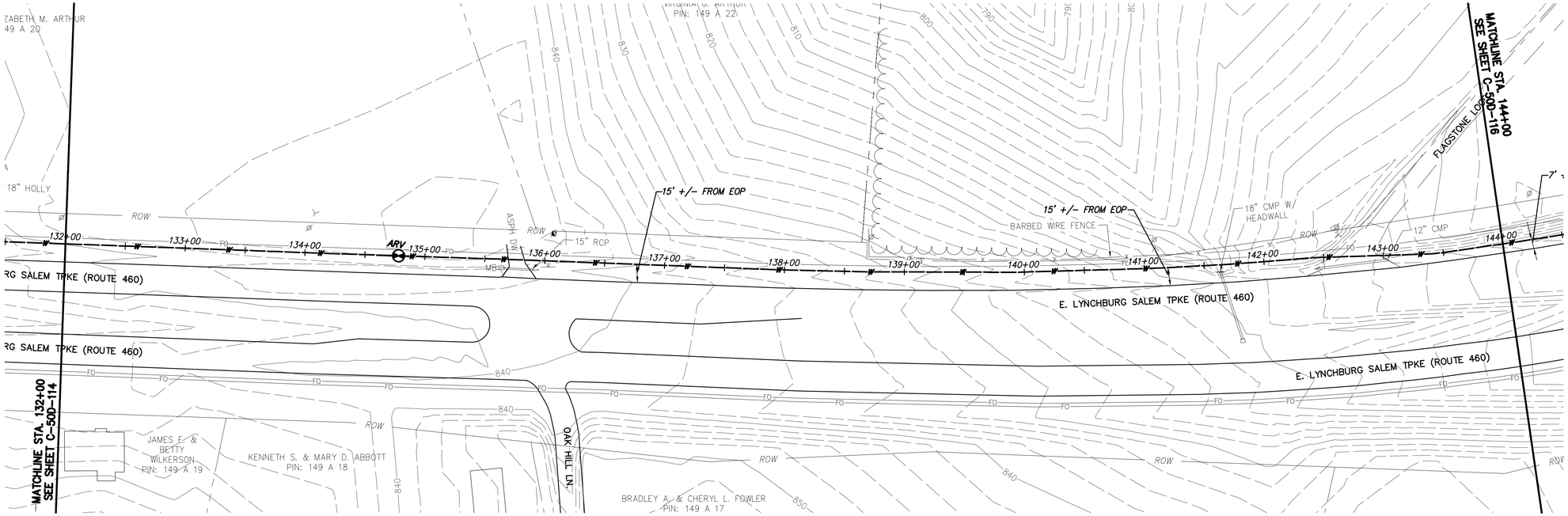
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

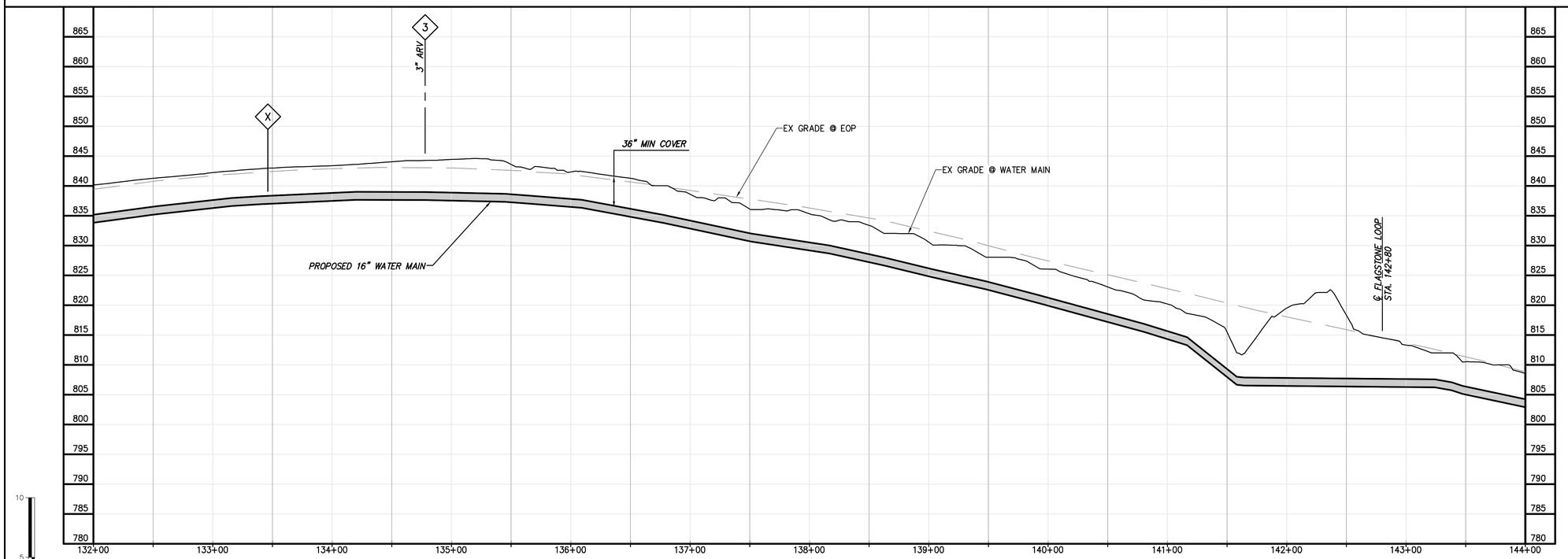
C-50D-114
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-113-117_27872.DWG
Saved: 6/4/2015 7:24:41 AM Plotted: 6/4/2015 11:09:51 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE			
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS	SNP	JRM	SMS
DATE			
6/4/2015			

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

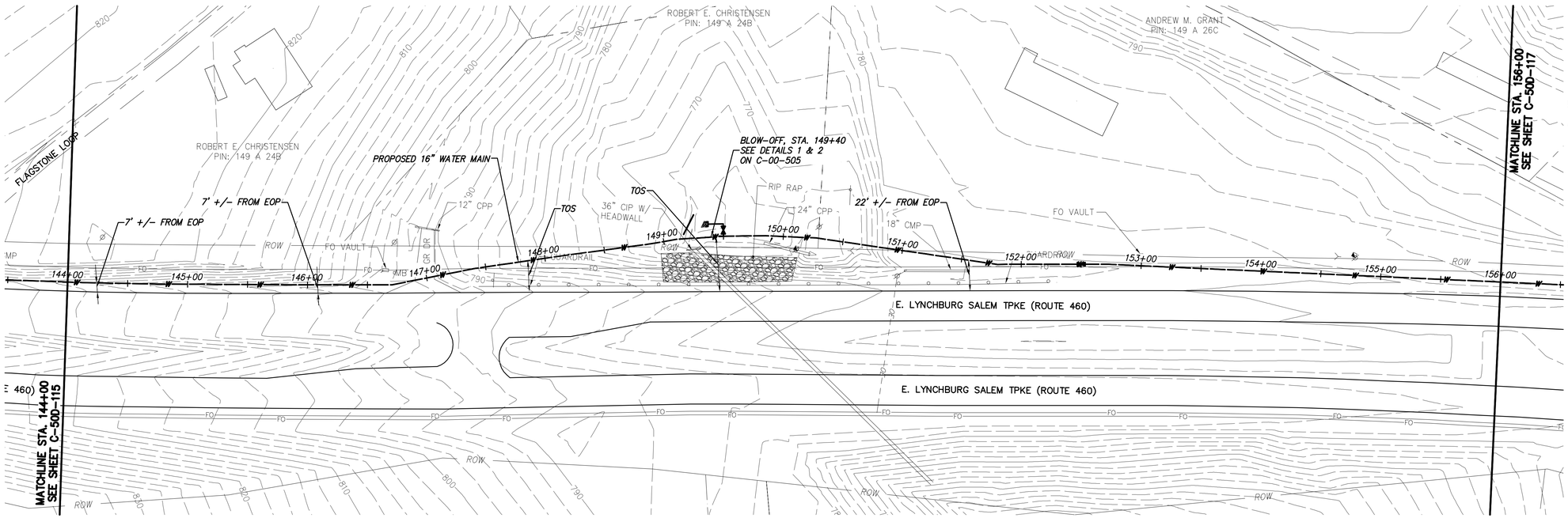
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

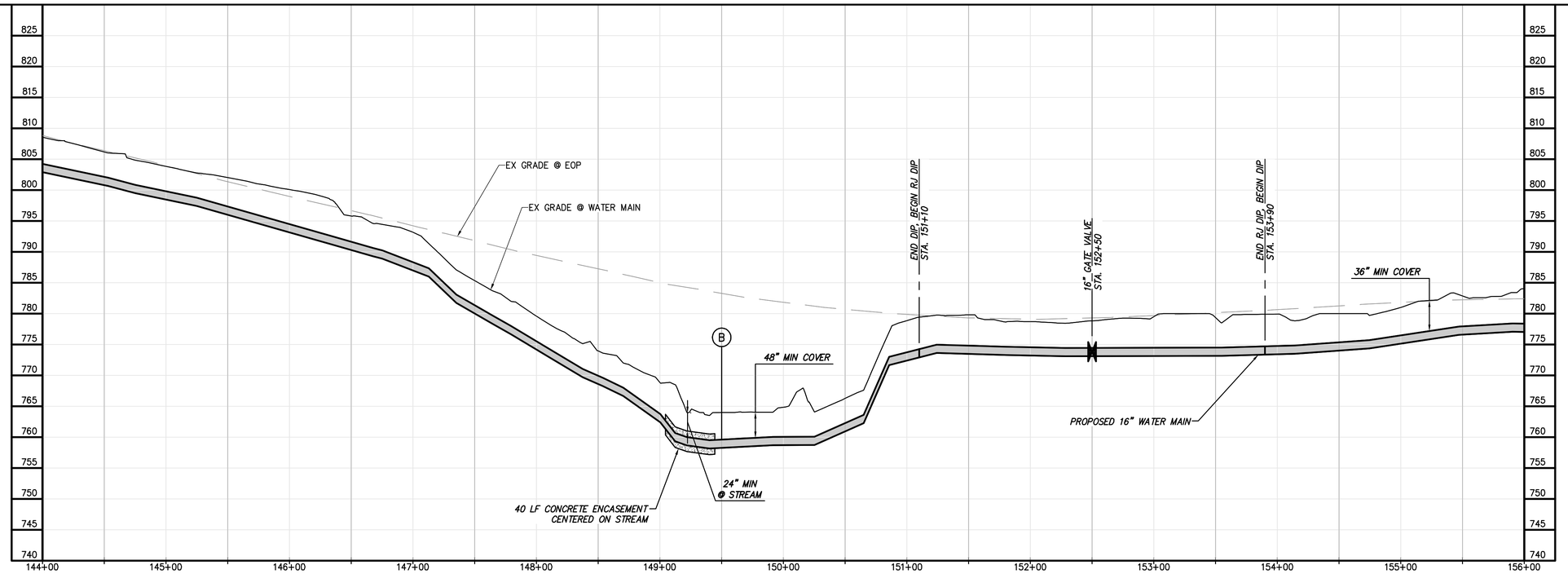
PROJECT NO.
27872

C-50D-115
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-113-117_27872.DWG
Saved: 6/4/2015 7:24:41 AM Plotted: 6/4/2015 11:10:27 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

0 50 100
Scale in feet

0 5 10
0 50 100
Scale in feet

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

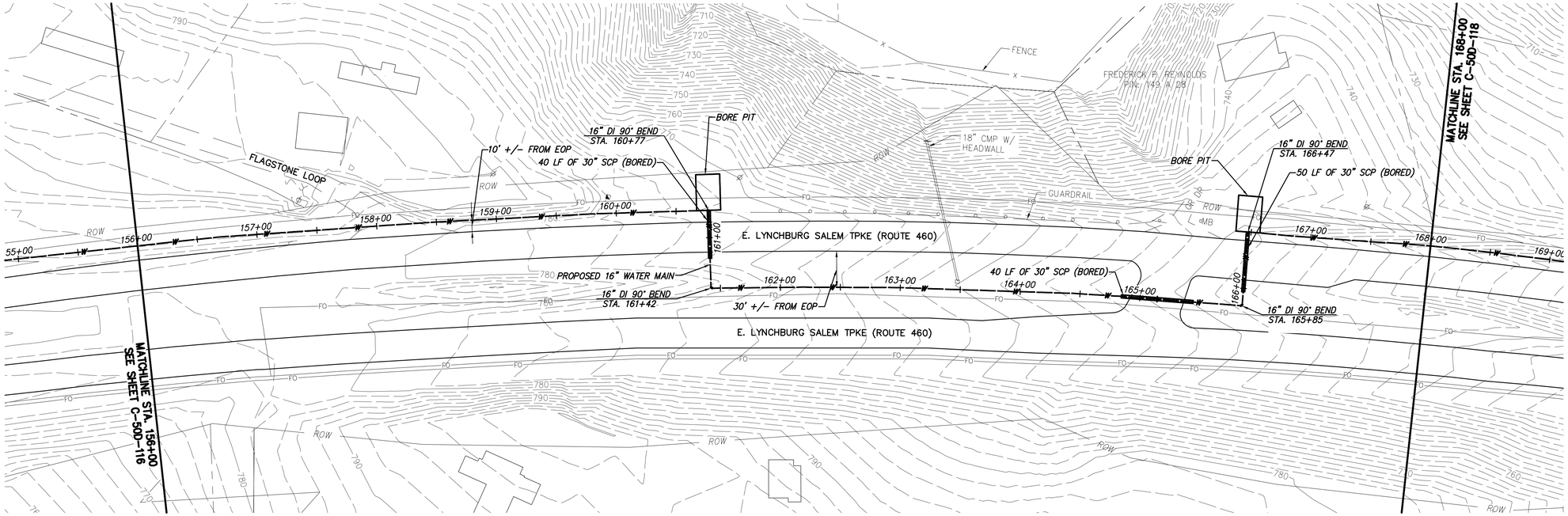
PROJECT NO.
27872

C-50D-116
SHEET
OF

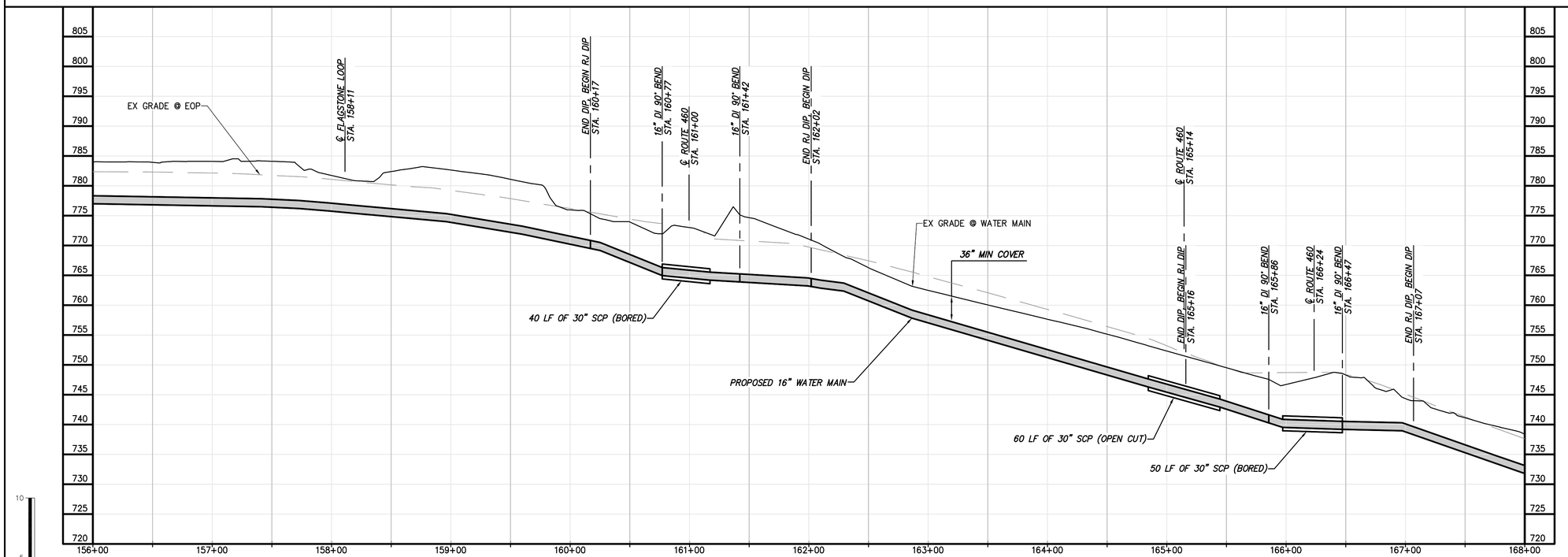
PRELIMINARY - NOT FOR CONSTRUCTION

FD7000
D7000

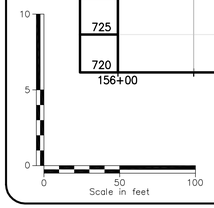
File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-113-117_27872.DWG
Saved: 6/4/2015 7:24:41 AM Plotted: 6/4/2015 11:11:03 AM User: Parks, Sarah LastSavedBy: 4465



WATER MAIN PLAN



WATER MAIN PROFILE



GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

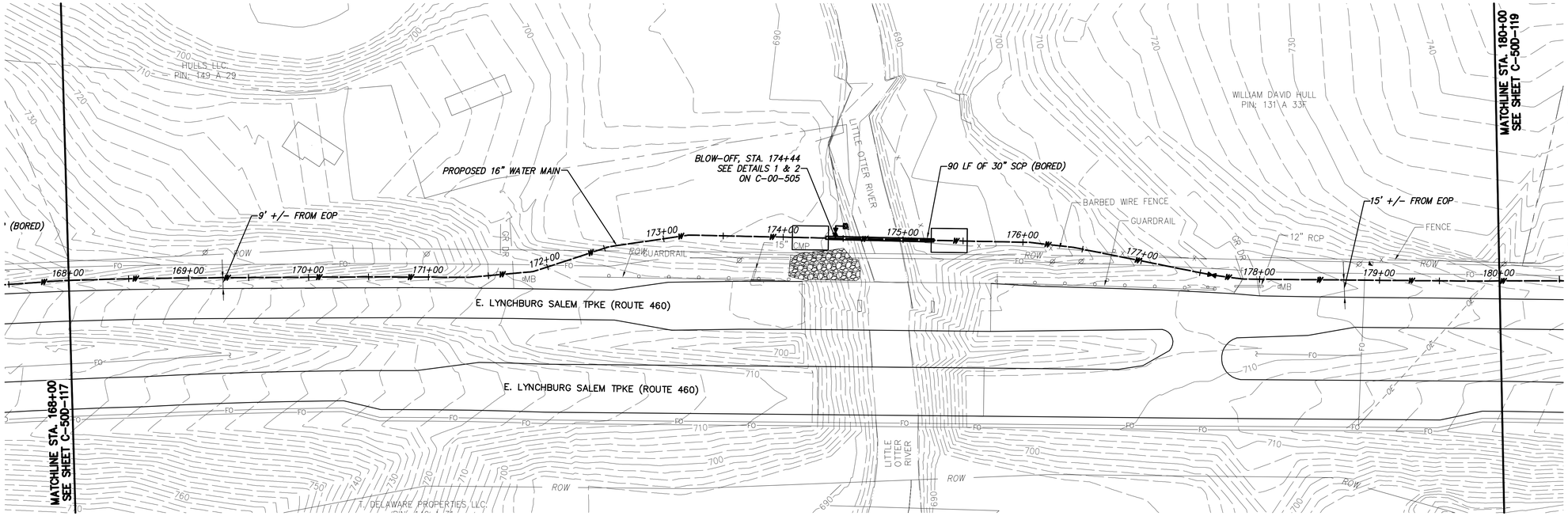
PROJECT NO.
27872

C-50D-117
SHEET
OF

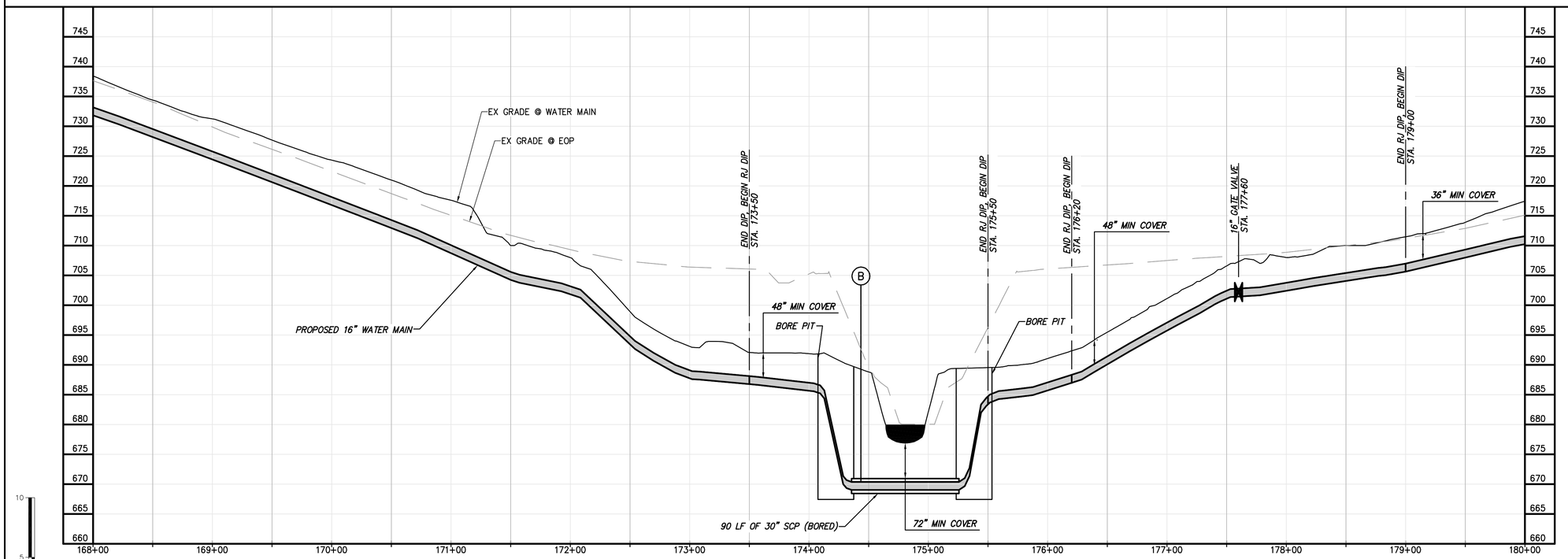
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50D-113-117_27872.DWG
Saved: 6/4/2015 7:24:41 AM Plotted: 6/4/2015 11:11:40 AM User: Parks, Sarah LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

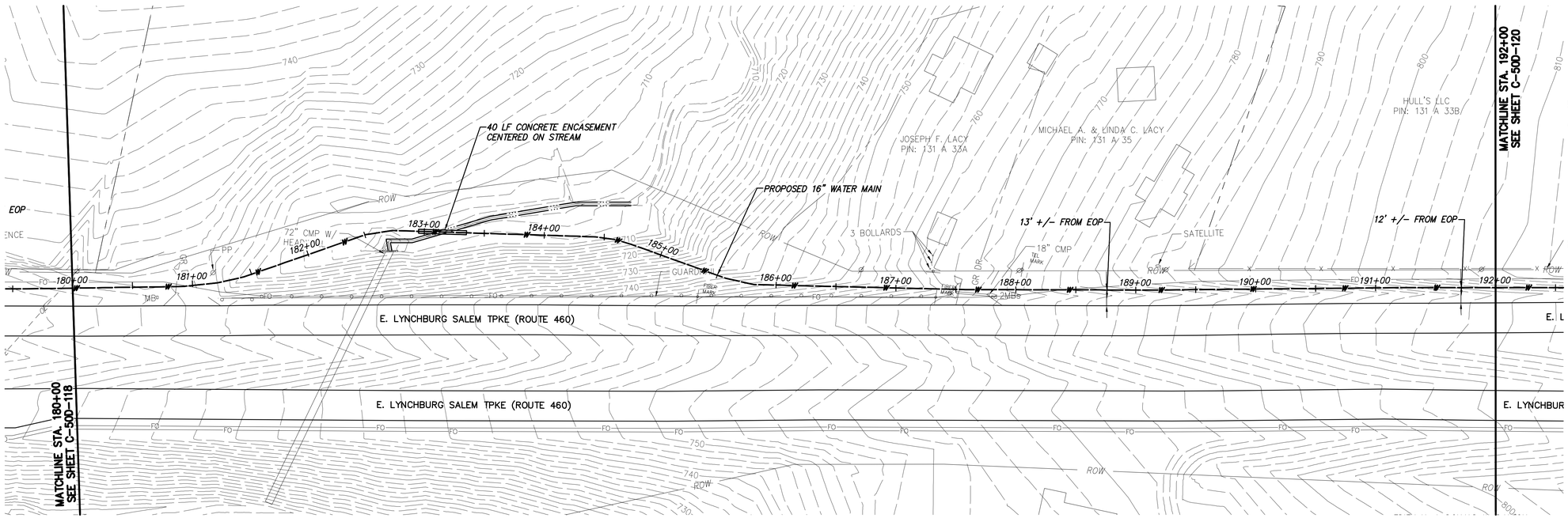
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

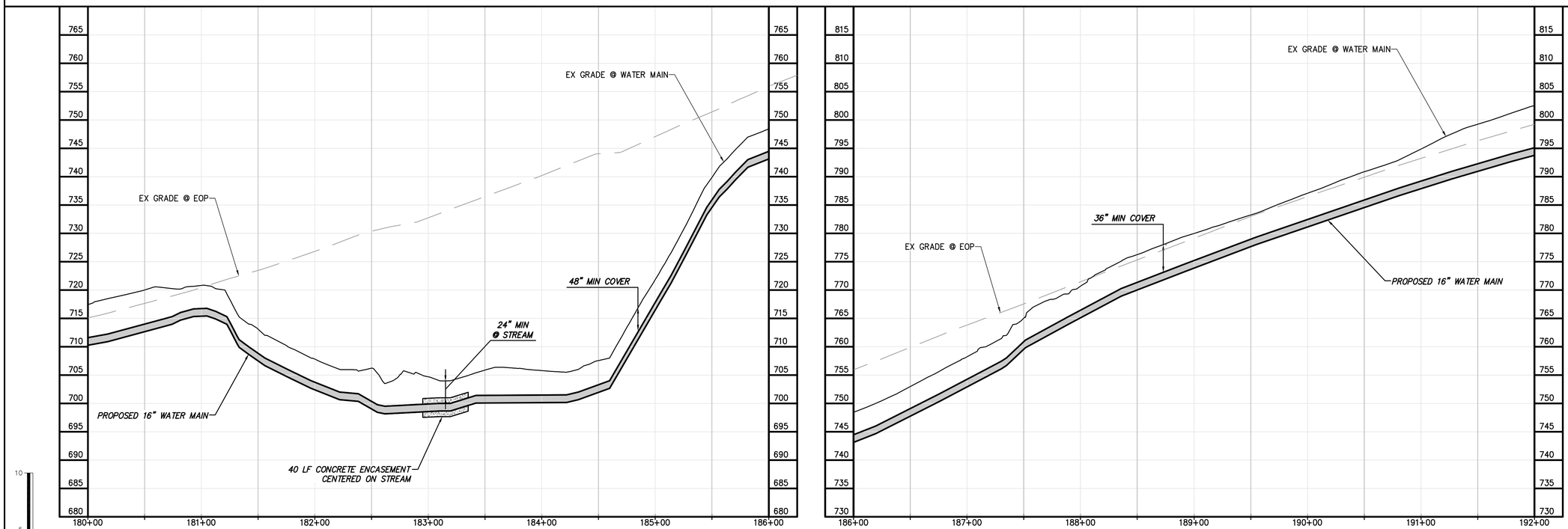
PROJECT NO.
27872

C-50D-118
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50D-118-122_27872.DWG
Saved: 6/4/2015 7:25:29 AM Plotted: 6/4/2015 11:13:12 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE
DATE: 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

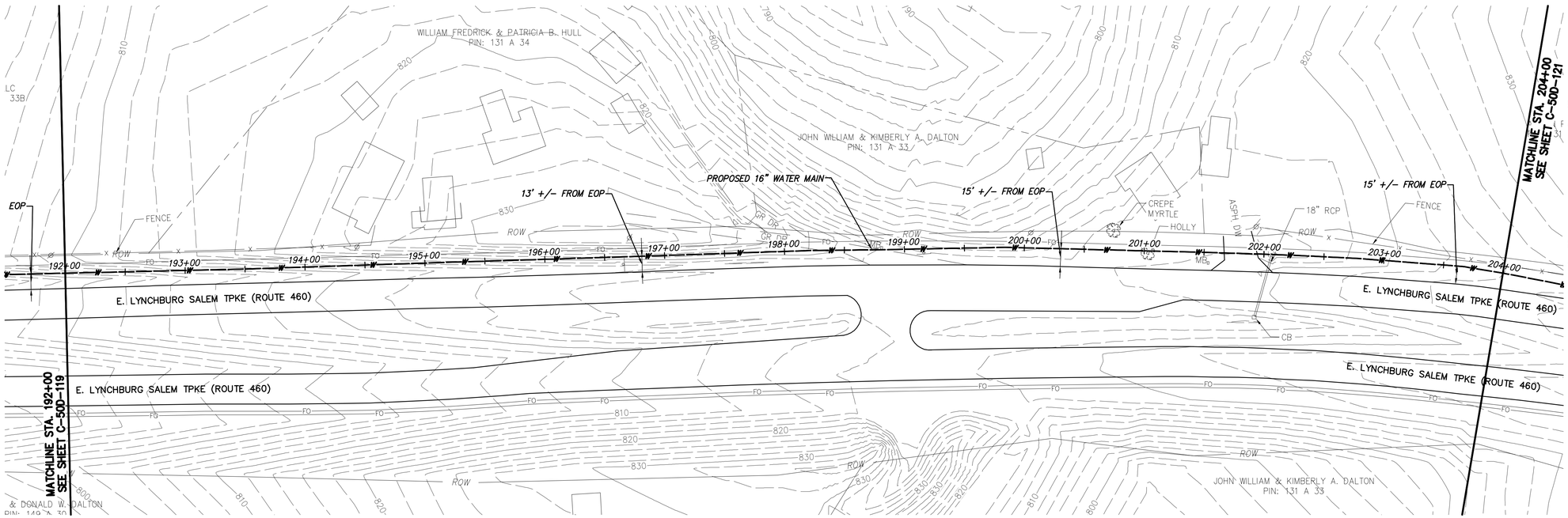
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

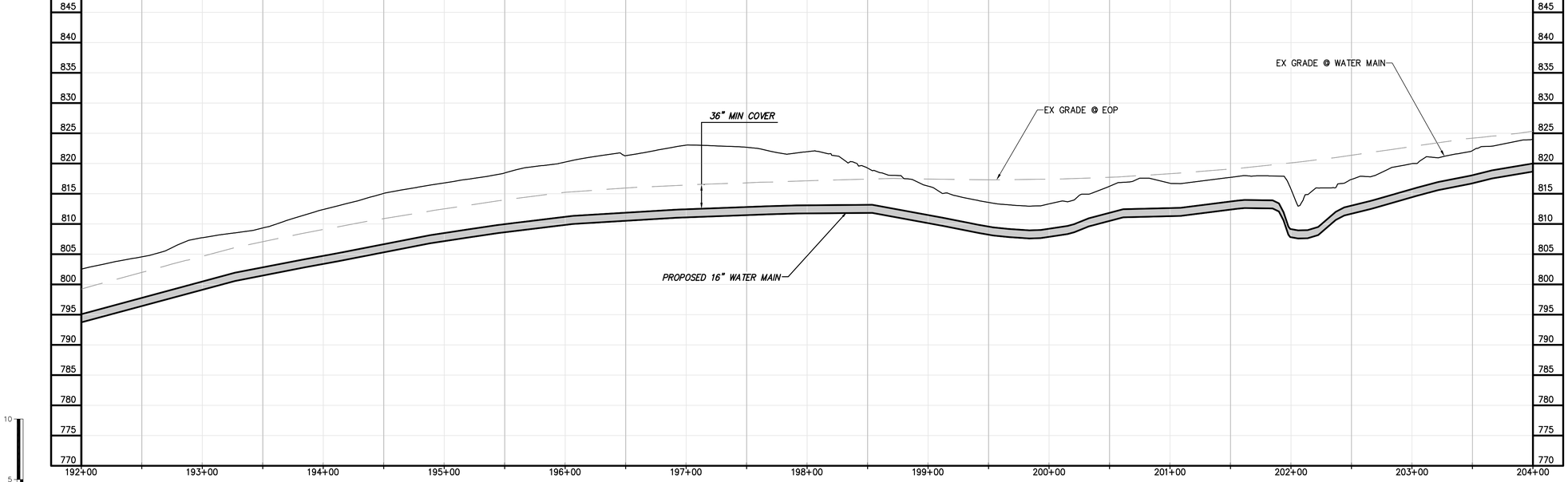
C-50D-119
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50D-118-122_27872.DWG
Saved: 6/4/2015 7:25:29 AM Plotted: 6/4/2015 11:13:54 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

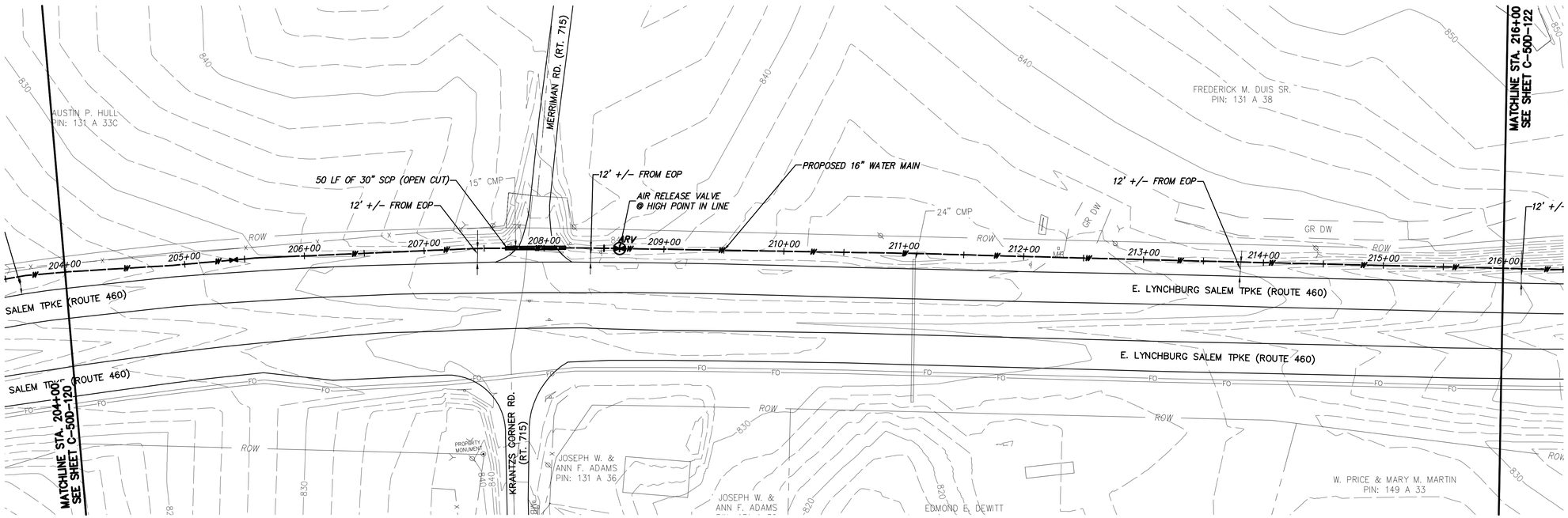
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

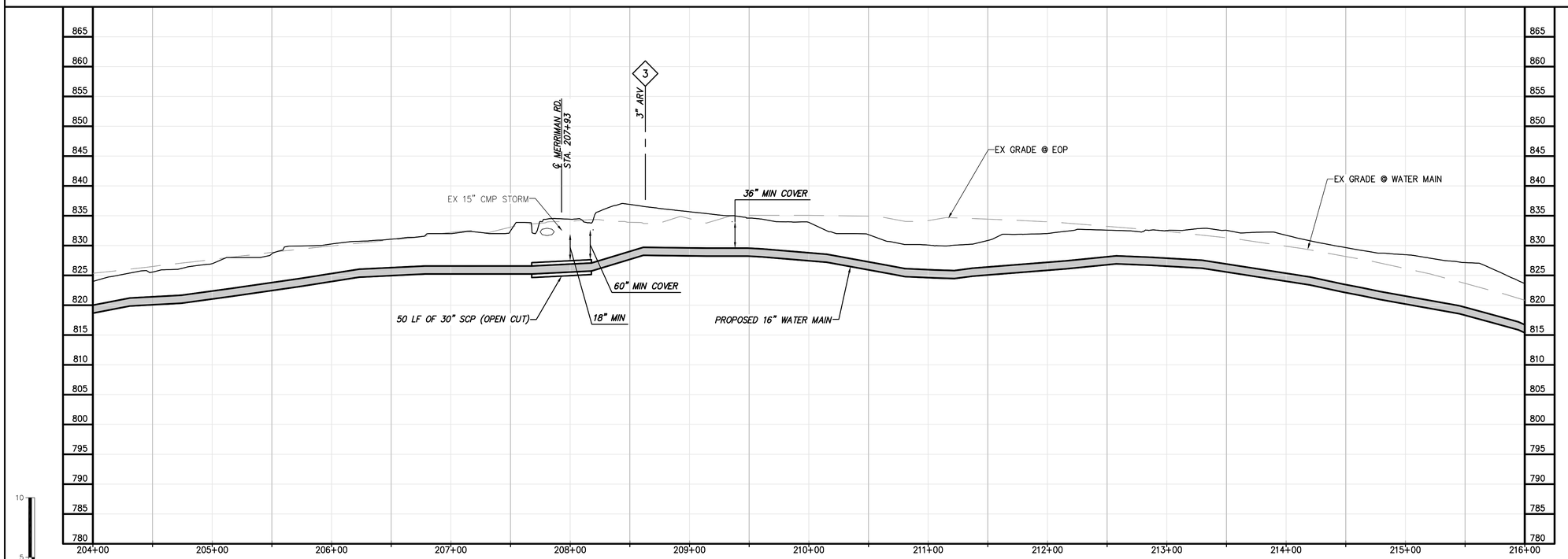
C-50D-120
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-500-118-122_27872.DWG
Saved: 6/4/2015 7:25:29 AM Plotted: 6/4/2015 11:14:28 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0436 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

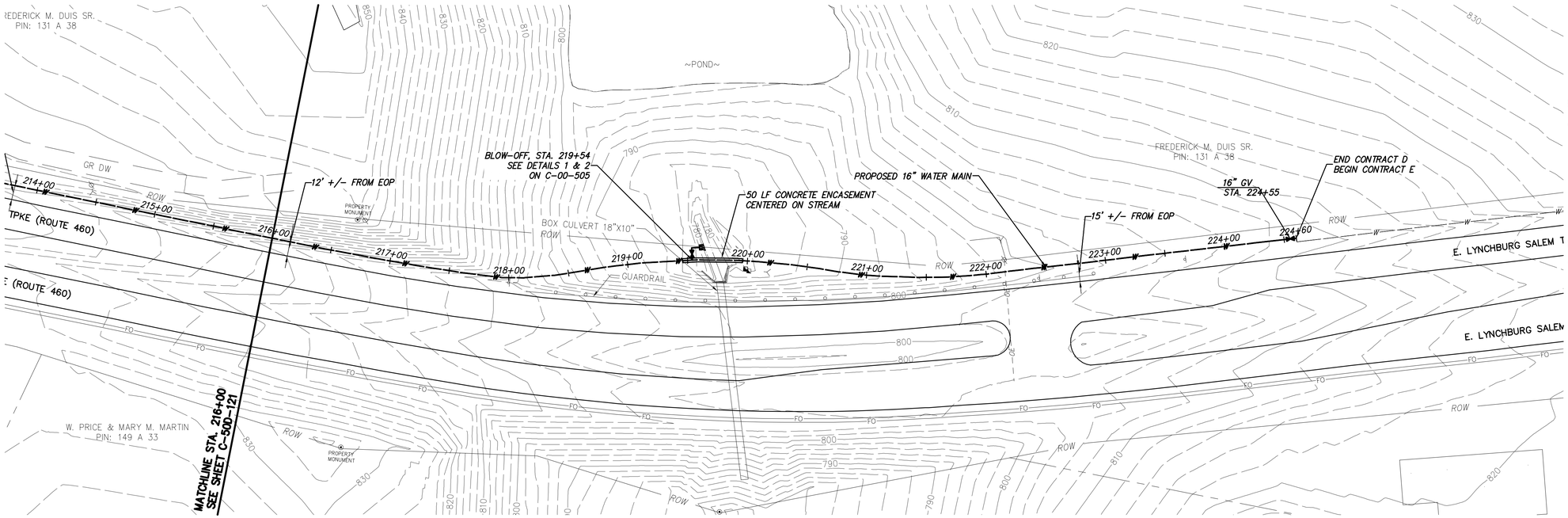
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

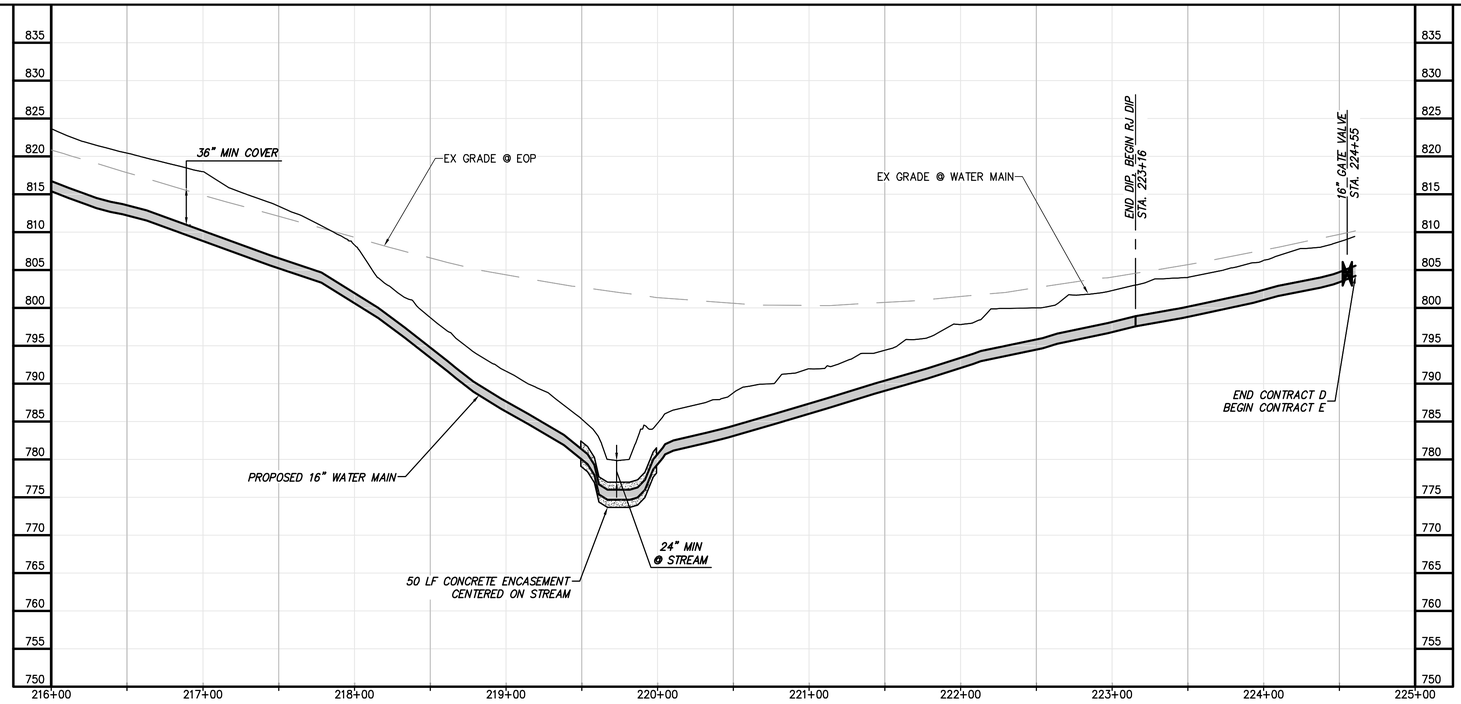
PROJECT NO.
27872

C-50D-121
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50D-118-122_27872.DWG
Saved: 6/4/2015 7:25:29 AM Plotted: 6/4/2015 11:15:02 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

0 50 100
Scale in feet

0 5 10
0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
DATE
6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT D WATER MAIN - PLAN AND PROFILE

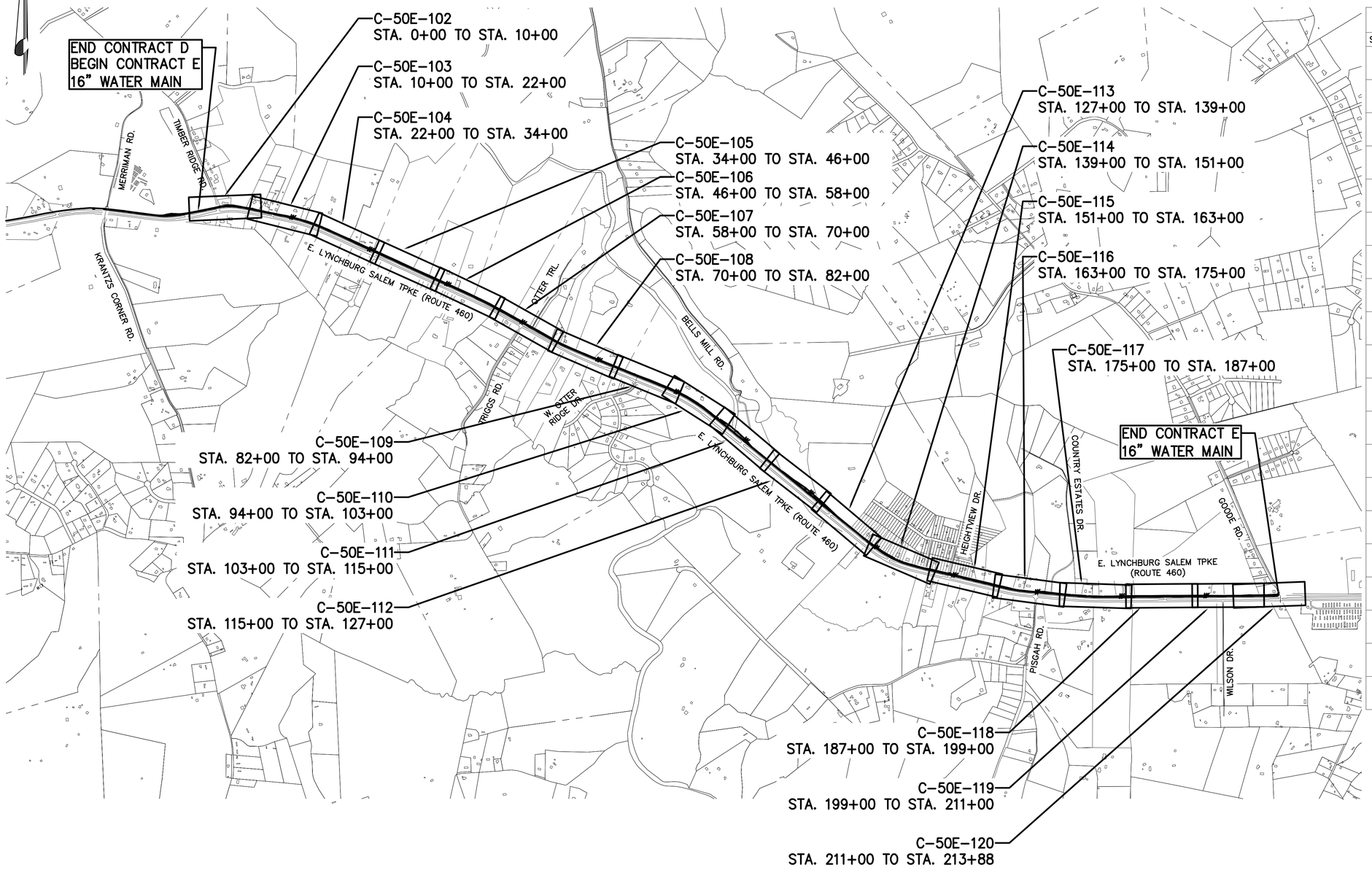
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50D-122
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-500-118-122_27872.DWG
Saved: 6/4/2015 7:25:29 AM Plotted: 6/4/2015 11:15:36 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
D7000



SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C-50E-101	CONTRACT E – WATER MAIN KEY PLAN
C-50E-102	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 0+00 TO STA. 10+00
C-50E-103	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 10+00 TO STA. 22+00
C-50E-104	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 22+00 TO STA. 34+00
C-50E-105	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 34+00 TO STA. 46+00
C-50E-106	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 46+00 TO STA. 58+00
C-50E-107	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 58+00 TO STA. 70+00
C-50E-108	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 70+00 TO STA. 82+00
C-50E-109	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 82+00 TO STA. 94+00
C-50E-110	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 94+00 TO STA. 103+00
C-50E-111	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 103+00 TO STA. 115+00
C-50E-112	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 115+00 TO STA. 127+00
C-50E-113	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 127+00 TO STA. 139+00
C-50E-114	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 139+00 TO STA. 151+00
C-50E-115	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 151+00 TO STA. 163+00
C-50E-116	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 163+00 TO STA. 175+00
C-50E-117	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 175+00 TO STA. 187+00
C-50E-118	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 187+00 TO STA. 199+00
C-50E-119	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 199+00 TO STA. 211+00
C-50E-120	CONTRACT E WATER MAIN – PLAN AND PROFILE EAST LYNCHBURG SALEM TPKE (RT 460) STA. 211+00 TO STA. 213+88

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0345 • www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
6/4/2015
DATE
REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E - WATER MAIN KEY PLAN

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

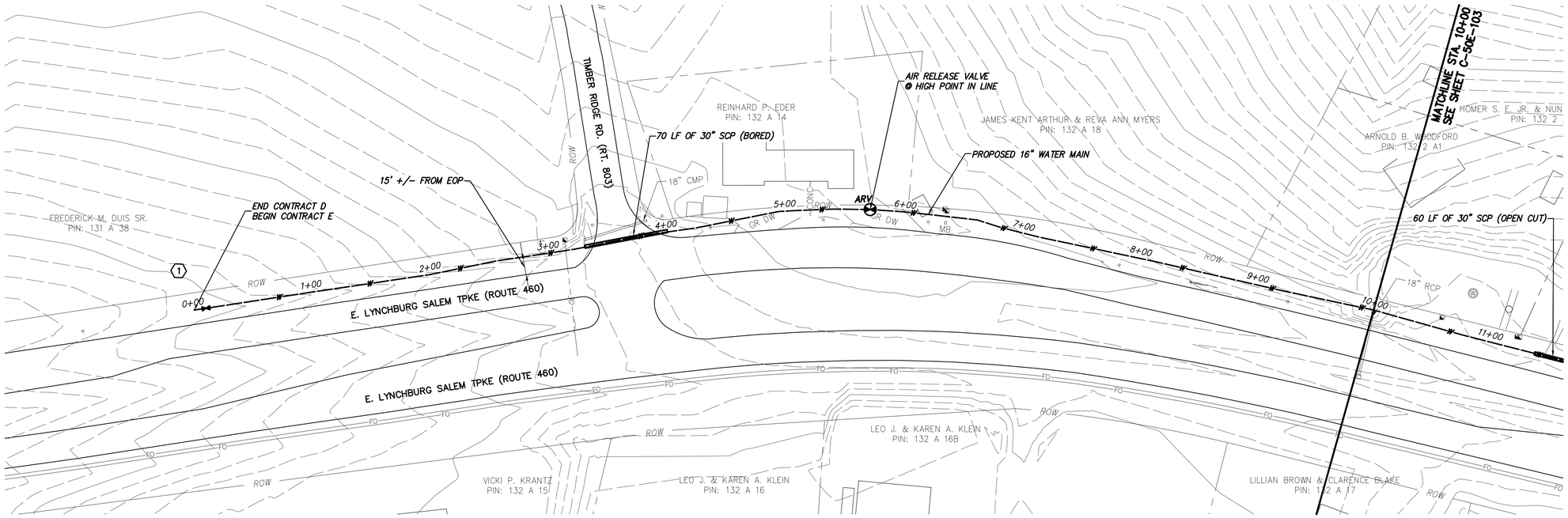
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-101
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-101_27872.DWG
Saved: 6/4/2015 11:05:37 AM Plotted: 6/4/2015 11:05:56 AM User: Ng, Kevin LastSavedBy: 5415
FD7000
D7000



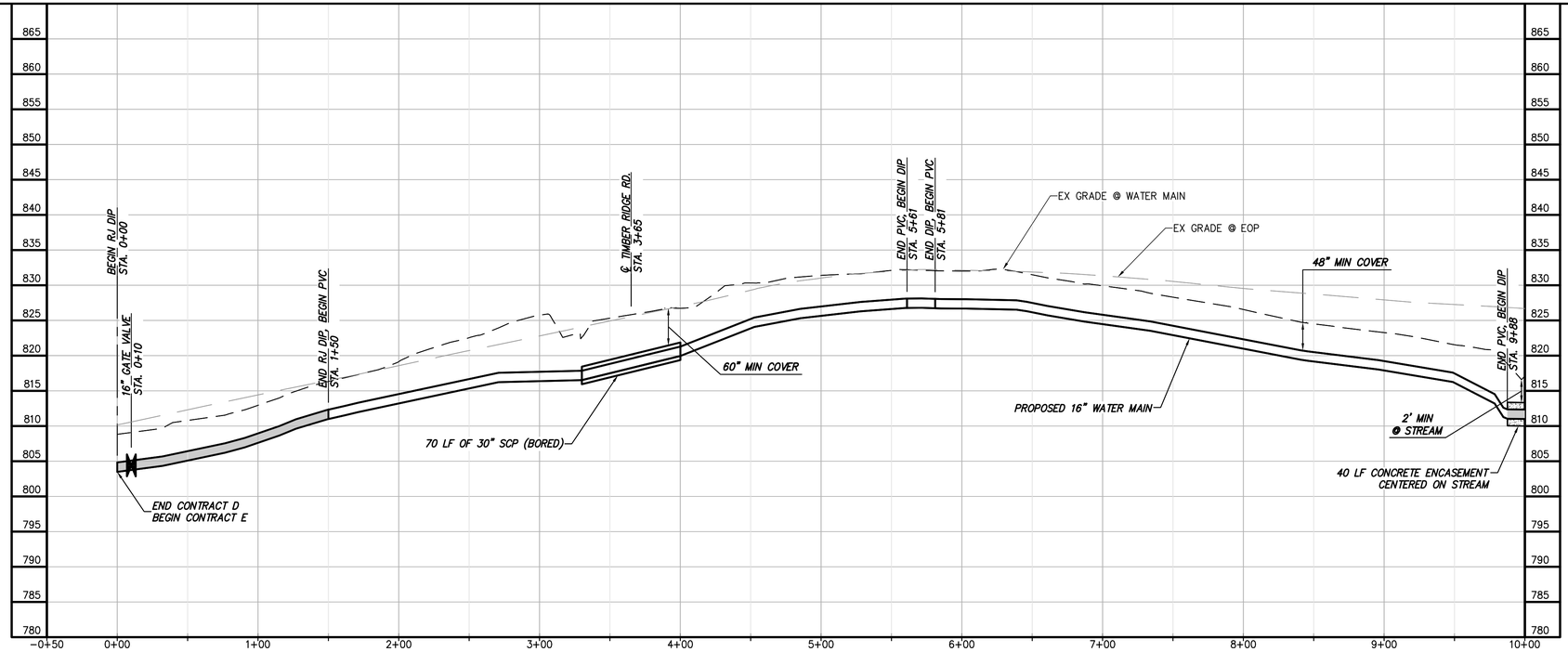
WATER MAIN PLAN

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——



WATER MAIN PROFILE

0 50 100
Scale in feet

0 5 10

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Metro (540) 552-0048 • www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
LEVEL 2 DESIGN DOCUMENTS			
REVISIONS AND RECORD OF ISSUE			
DATE			
6/4/2015			

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

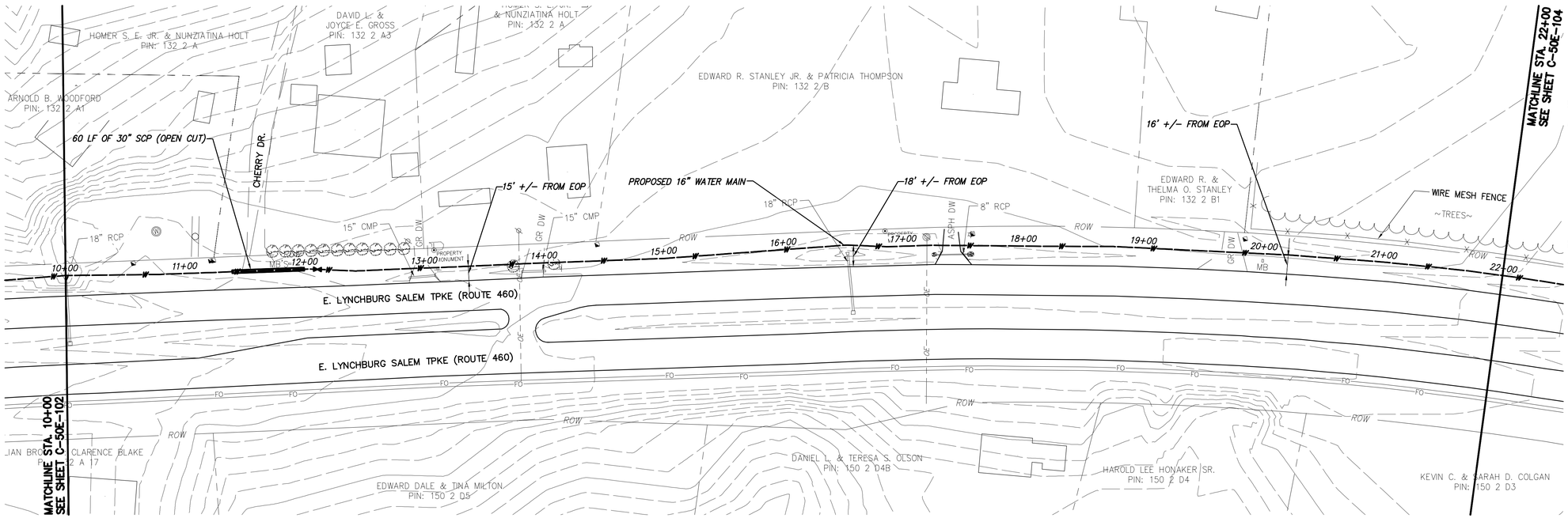
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-102
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-102-106_27872.DWG
Saved: 6/4/2015 7:27:30 AM Plotted: 6/4/2015 9:22:58 AM User: Parks, Sarah LastSavedBy: 4465
FD7000
DT000



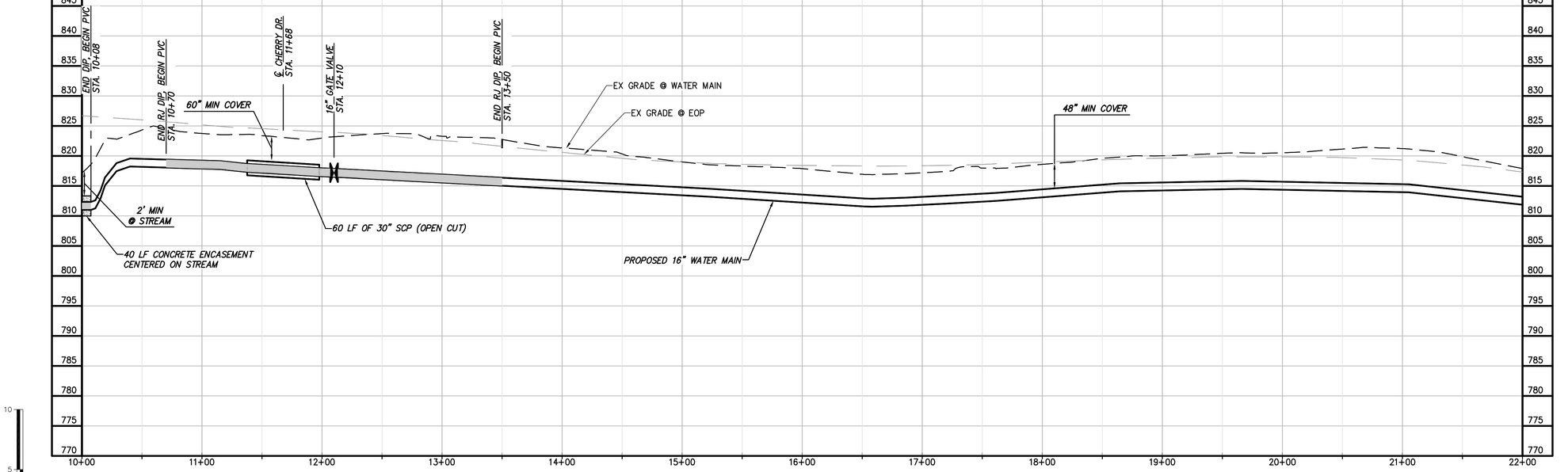
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS	SNP	JRM	SMS
6/4/2015			

DATE — REVISIONS AND RECORD OF ISSUE

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

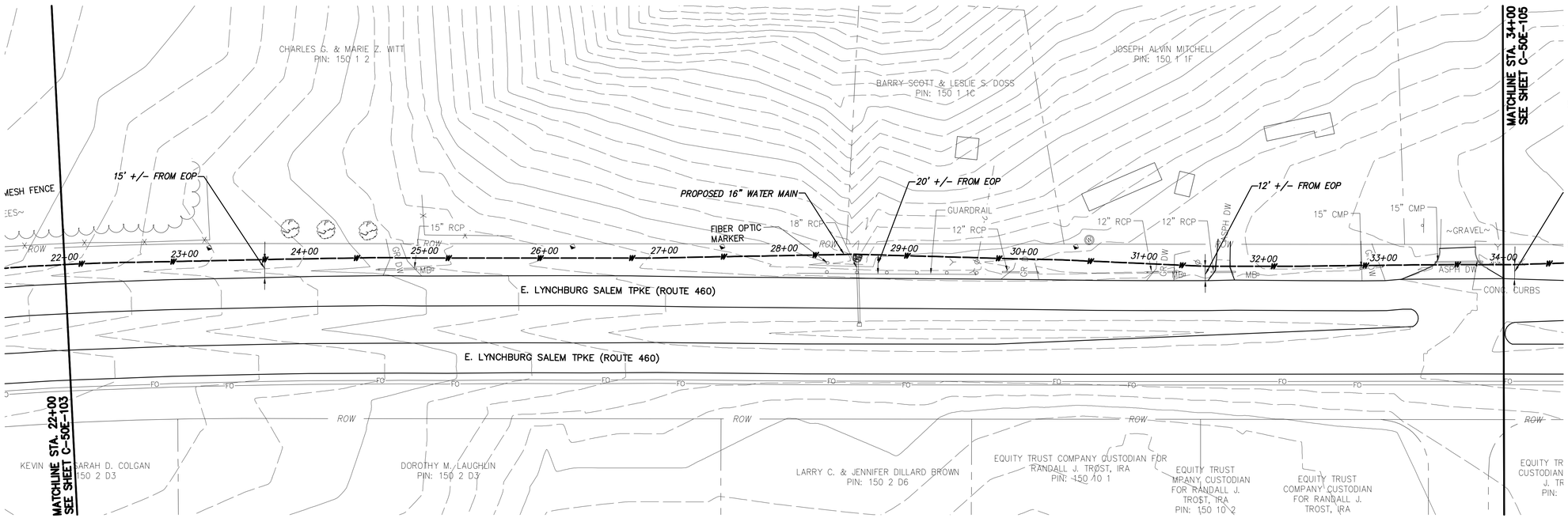
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

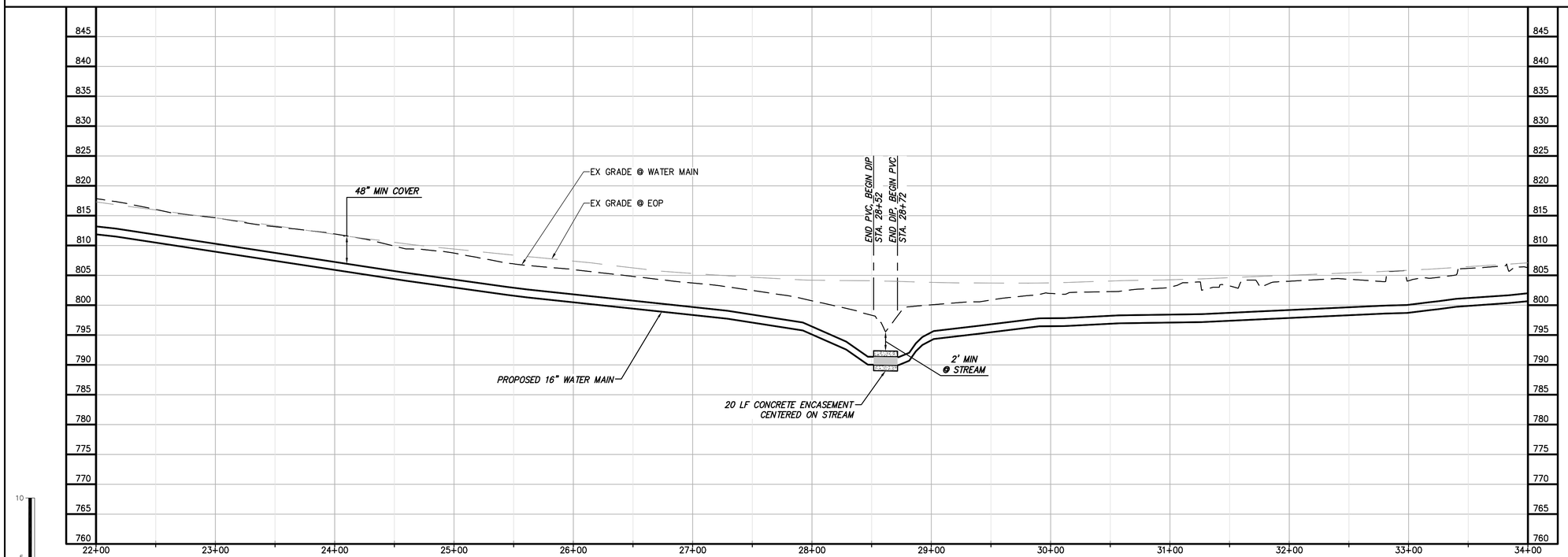
PROJECT NO.
27872

C-50E-103
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-102-106_27872.DWG
Saved: 6/4/2015 9:50:00 AM Plotted: 6/4/2015 9:53:28 AM User: Ng, Kevin LastSavedBy: 5415
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:
SAVED:
PLOTTED:
USER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

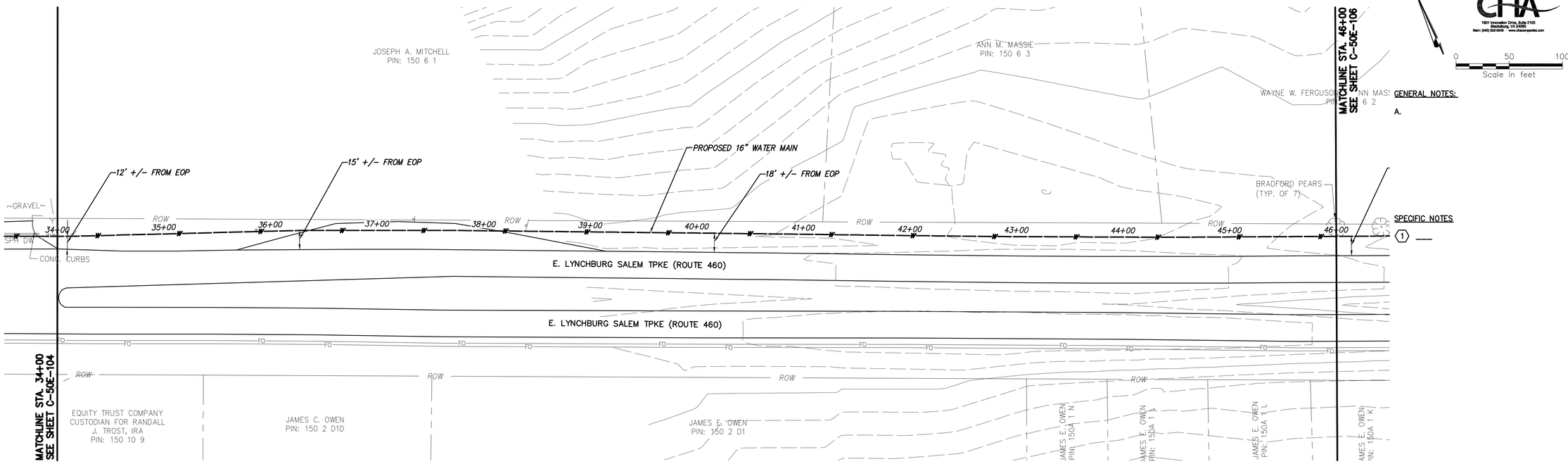
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

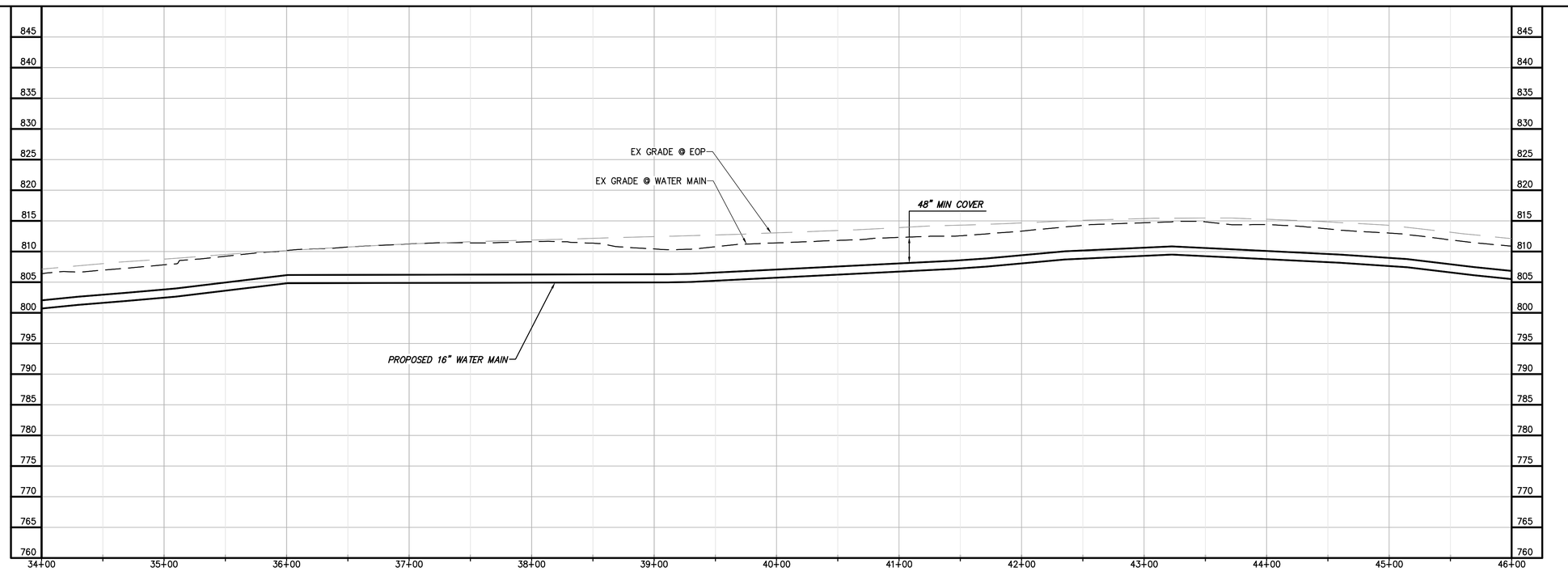
C-50E-104
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50E-102-106_27872.DWG
Saved: 6/4/2015 9:50:00 AM Plotted: 6/4/2015 9:54:02 AM User: Ng, Kevin LastSavedBy: 5415

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE: 6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:

XREF1:
XREF2:
XREF3:
XREF4:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

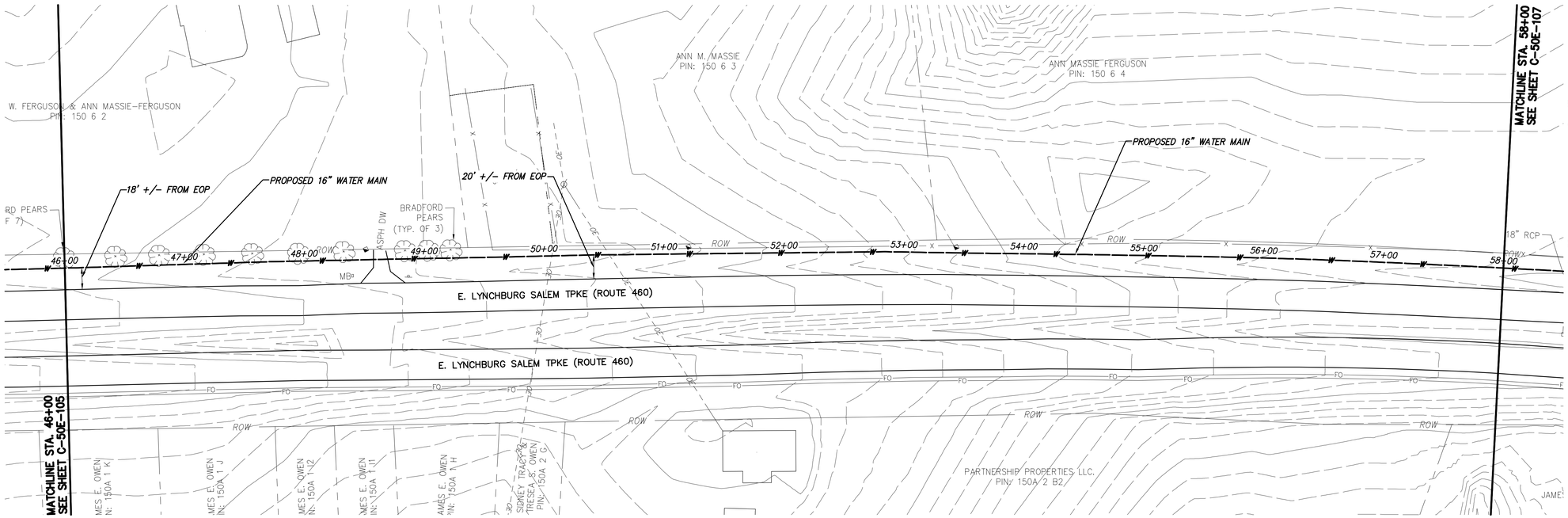
PROJECT NO.
27872

C-50E-105
SHEET
OF

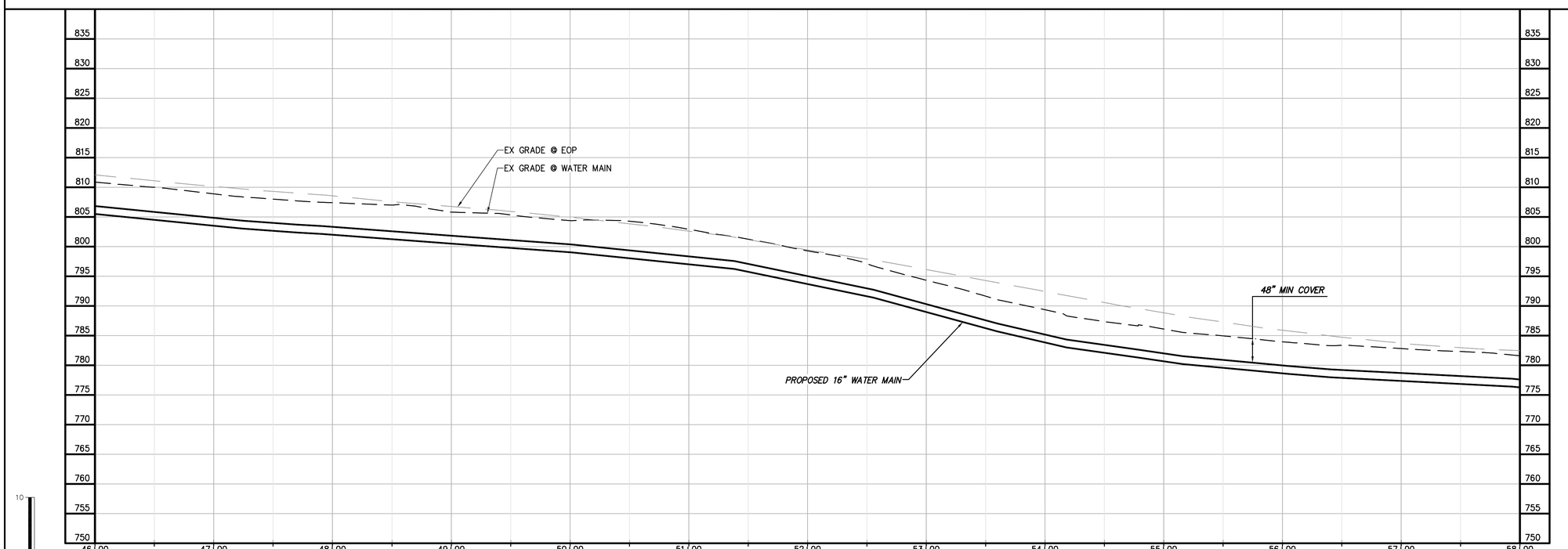
PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-102-106_27872.DWG
Saved: 6/4/2015 9:50:00 AM Plotted: 6/4/2015 9:54:30 AM User: Ng, Kevin LastSavedBy: 5415

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

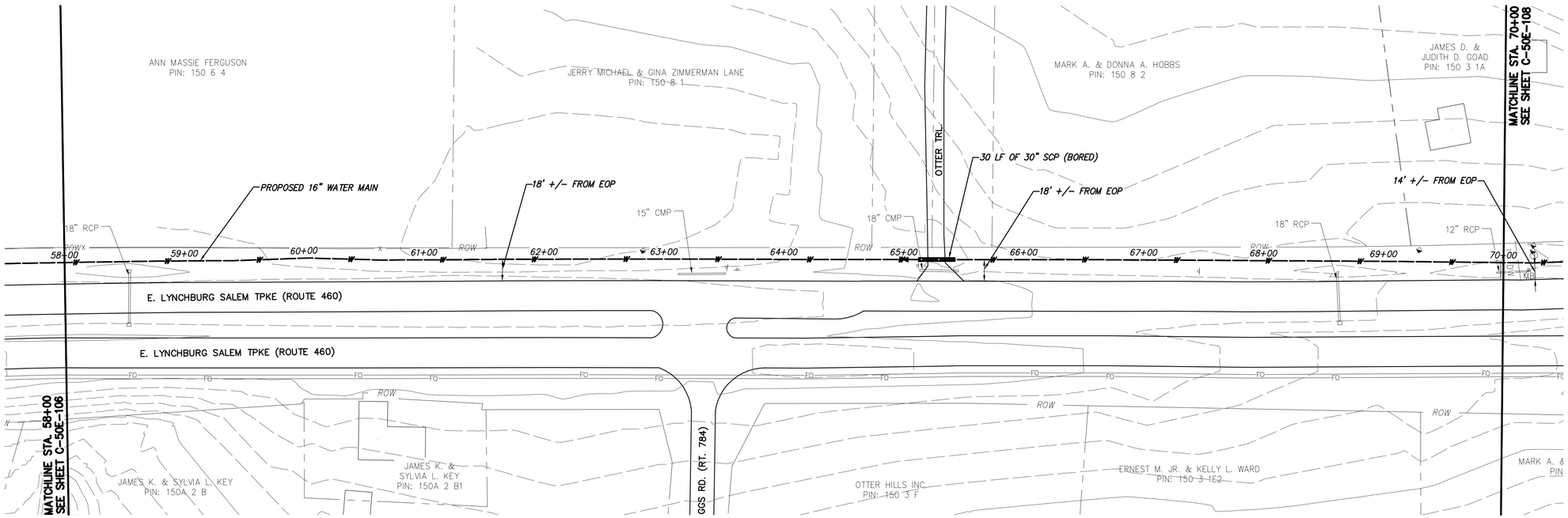
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

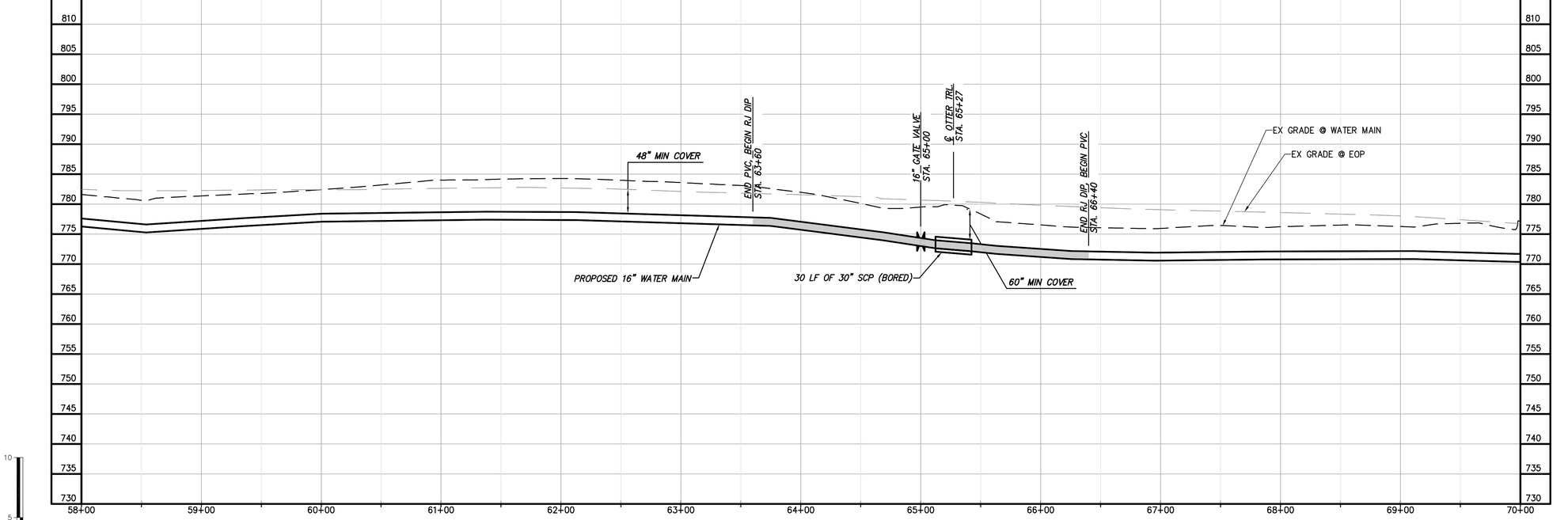
C-50E-106
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-102-106_27872.DWG
Saved: 6/4/2015 9:50:00 AM Plotted: 6/4/2015 9:55:02 AM User: Ng, Kevin LastSavedBy: 5415

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

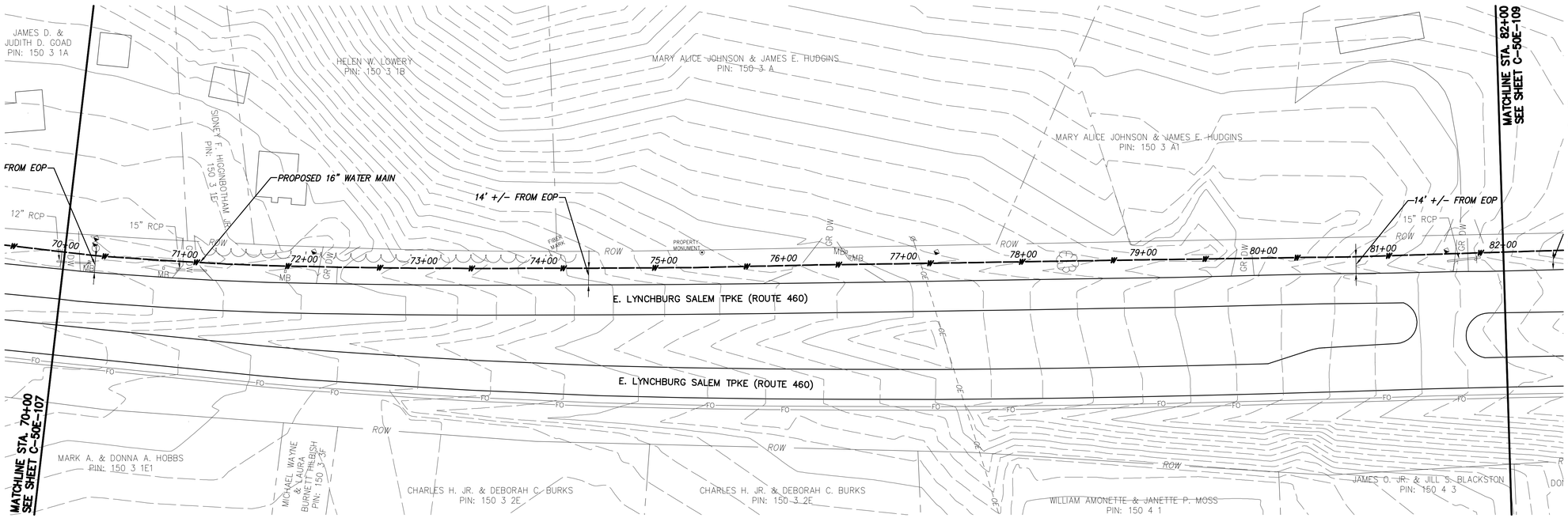
PROJECT NO.
27872

C-50E-107
SHEET
OF

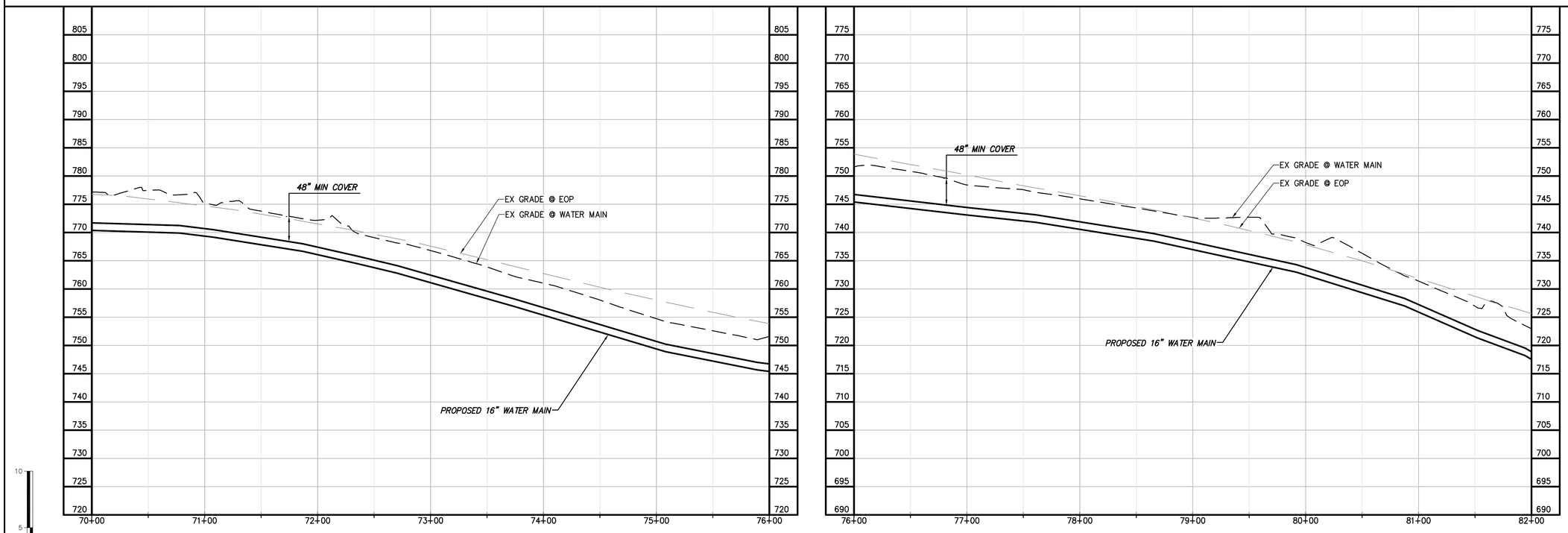
0 50 100
Scale in feet

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-107-110_27872.DWG
Saved: 6/4/2015 7:27:54 AM Plotted: 6/4/2015 9:56:42 AM User: Ng, Kevin LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE
DATE: 6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

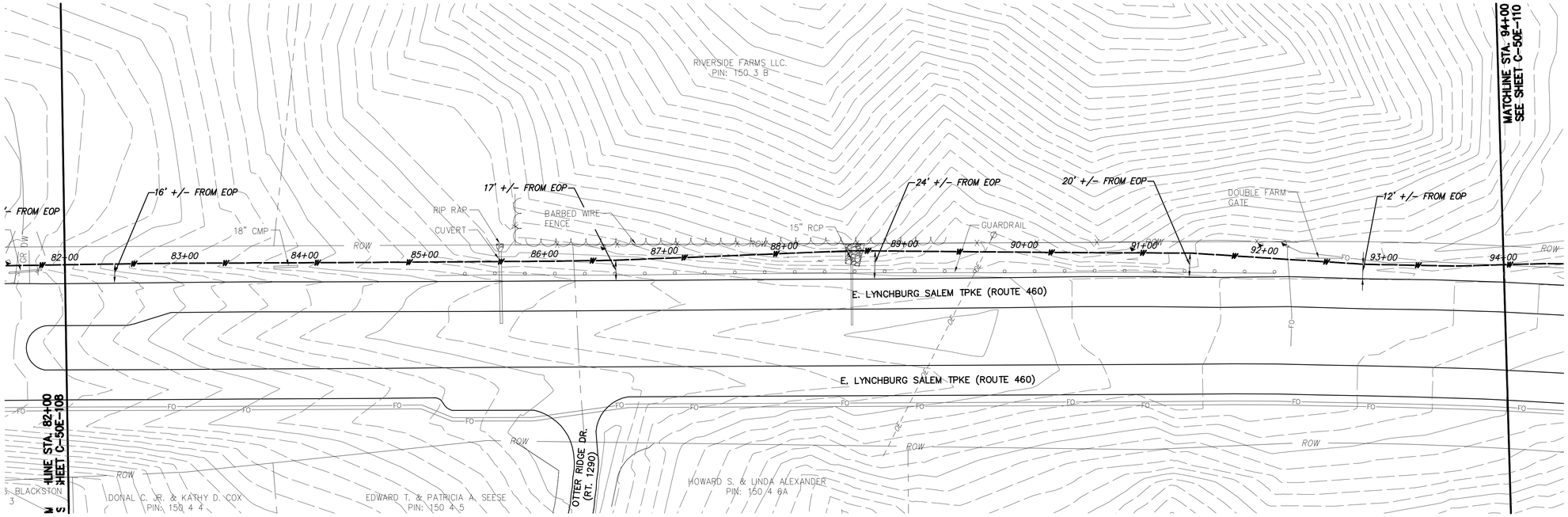
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

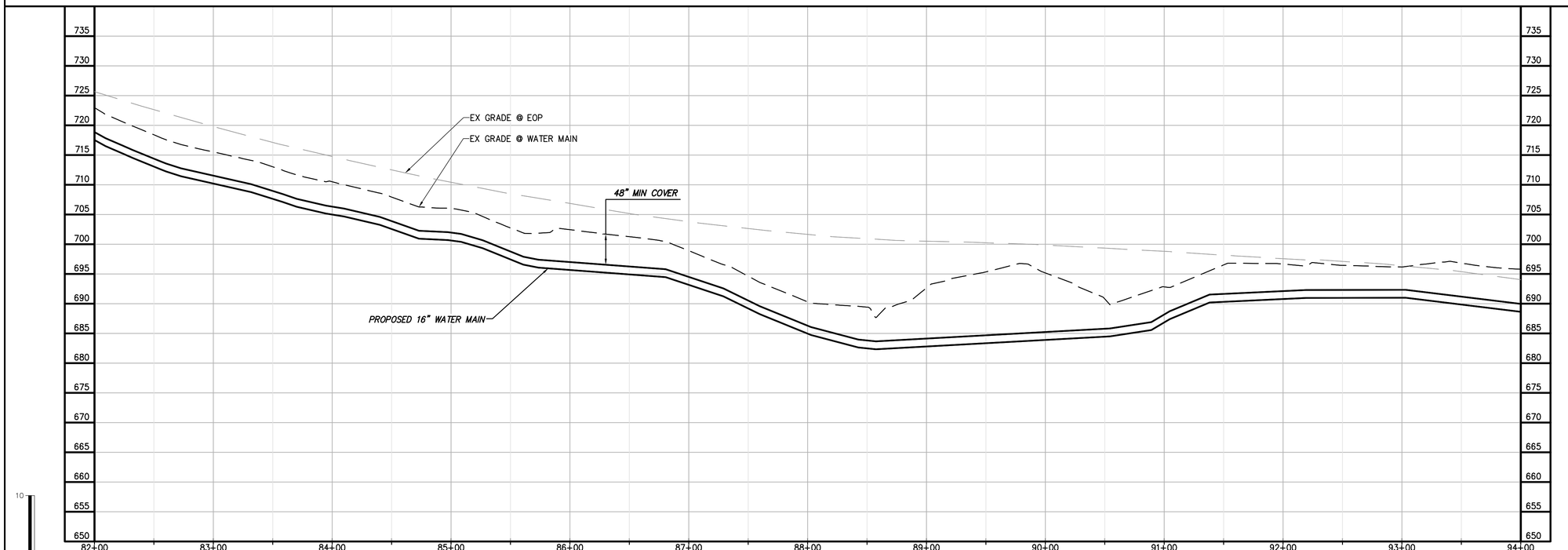
PROJECT NO.
27872

C-50E-108
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50E-107-110_27872.DWG
Saved: 6/4/2015 7:27:54 AM Plotted: 6/4/2015 9:57:23 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0048 • www.chacompanies.com

NO.	BY	CK APP
	SNP	JRM SMS
	SNP	JRM SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.®
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

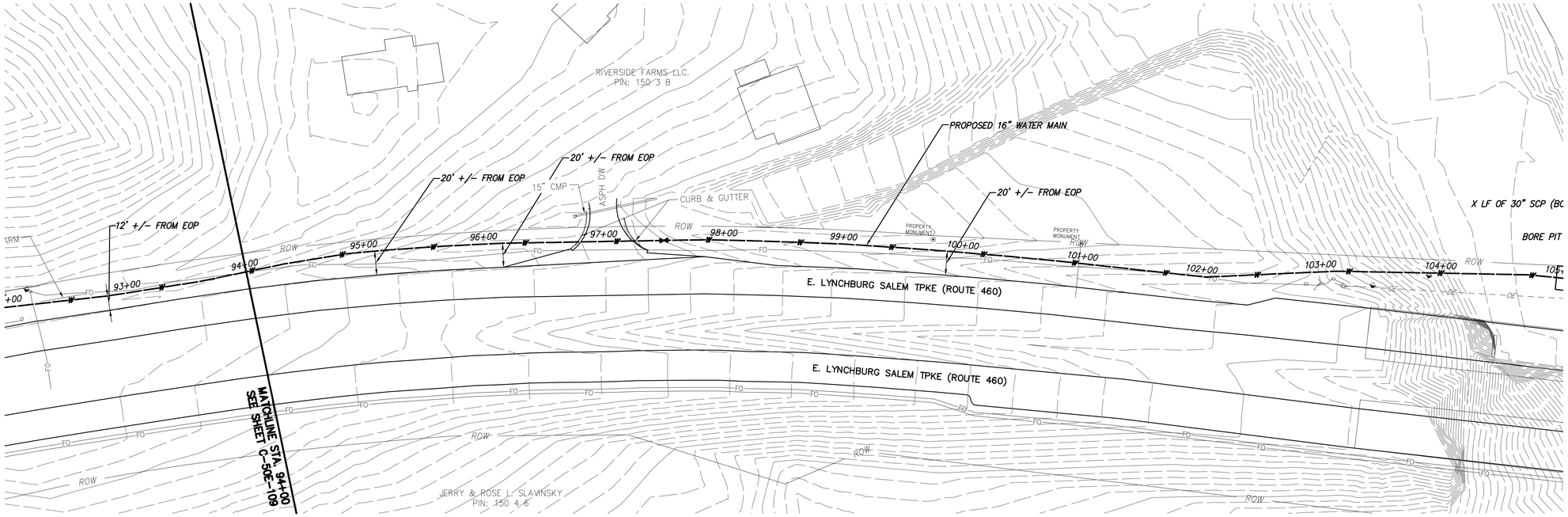
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-109
SHEET
OF

FD7000
D7800

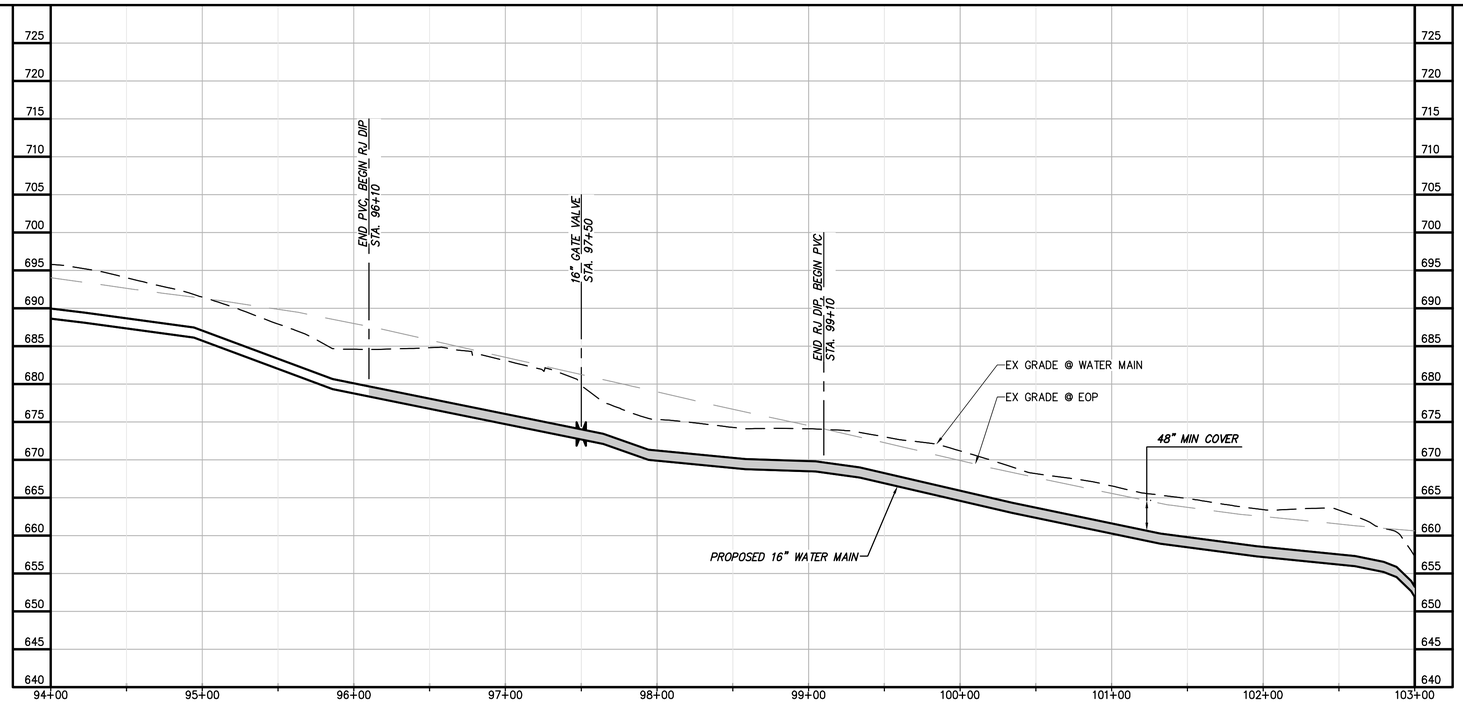
File: V:\PROJECTS\ANY\K63\27872\CADD_ACAD\C-50E-107-110_27872.DWG
Saved: 6/4/2015 11:08:07 AM Plotted: 6/4/2015 11:09:10 AM User: Ng, Kevin LastSavedBy: 5415



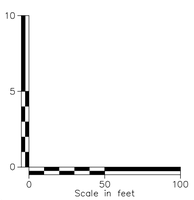
WATER MAIN PLAN

GENERAL NOTES:

A.



WATER MAIN PROFILE



PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-0345 • www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE
DATE
6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.®
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

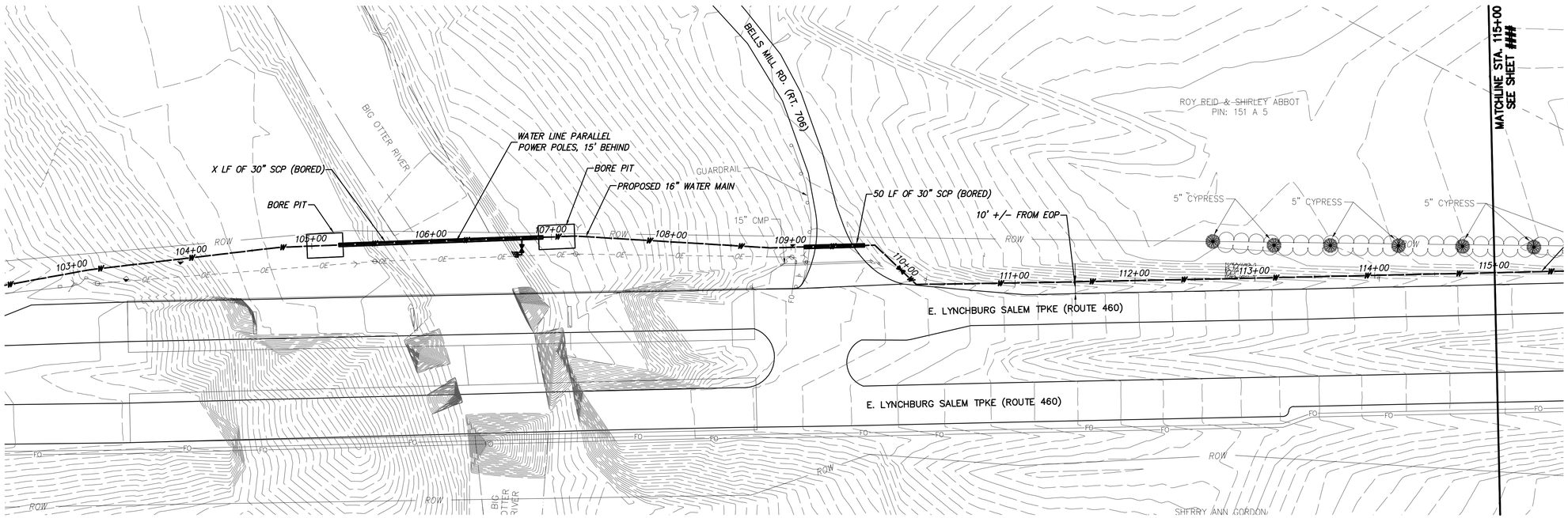
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-110
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-107-110_27872.DWG
Saved: 6/4/2015 11:08:07 AM Plotted: 6/4/2015 11:10:35 AM User: Ng, Kevin LastSavedBy: 5415
FD7000
D7800



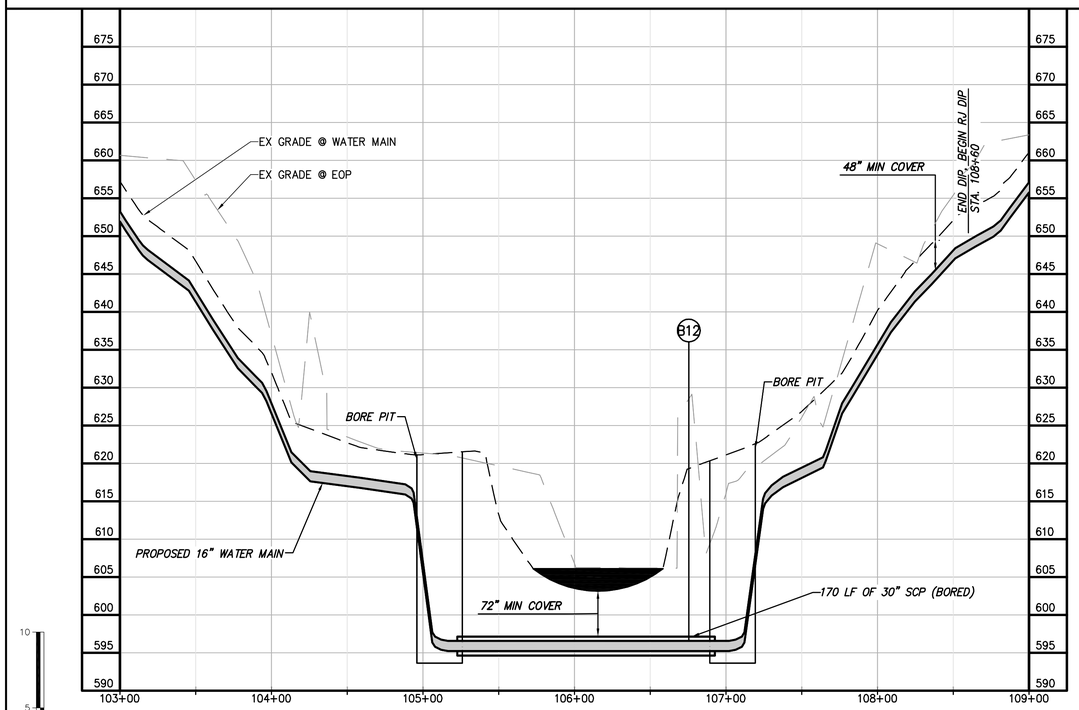
WATER MAIN PLAN

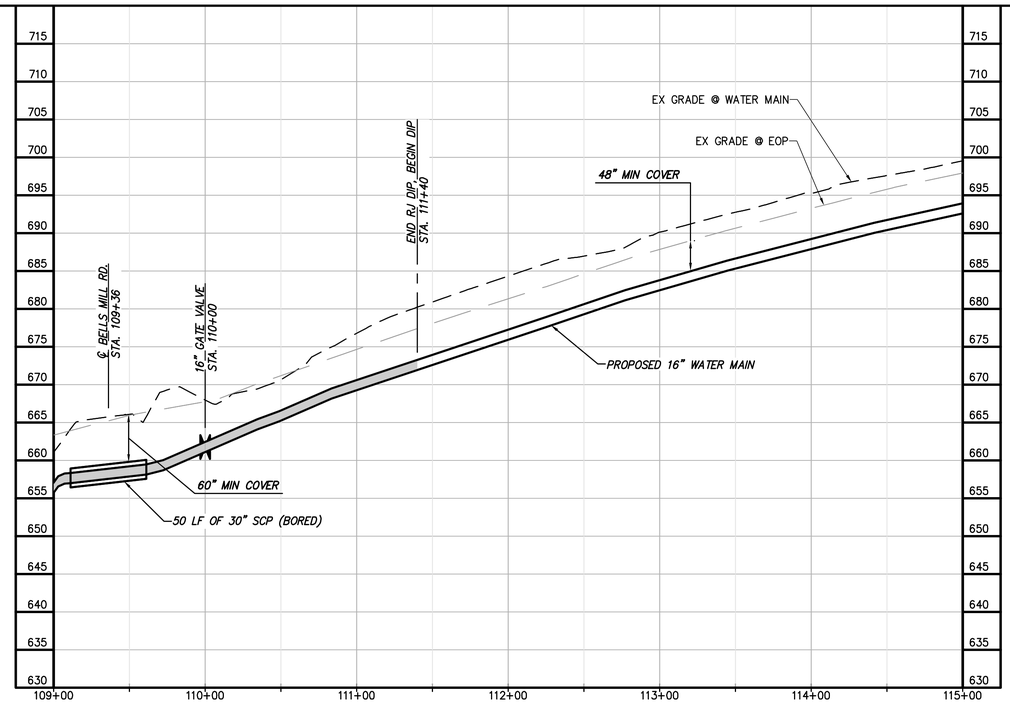
GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——





WATER MAIN PROFILE

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

0 50 100
Scale in feet

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

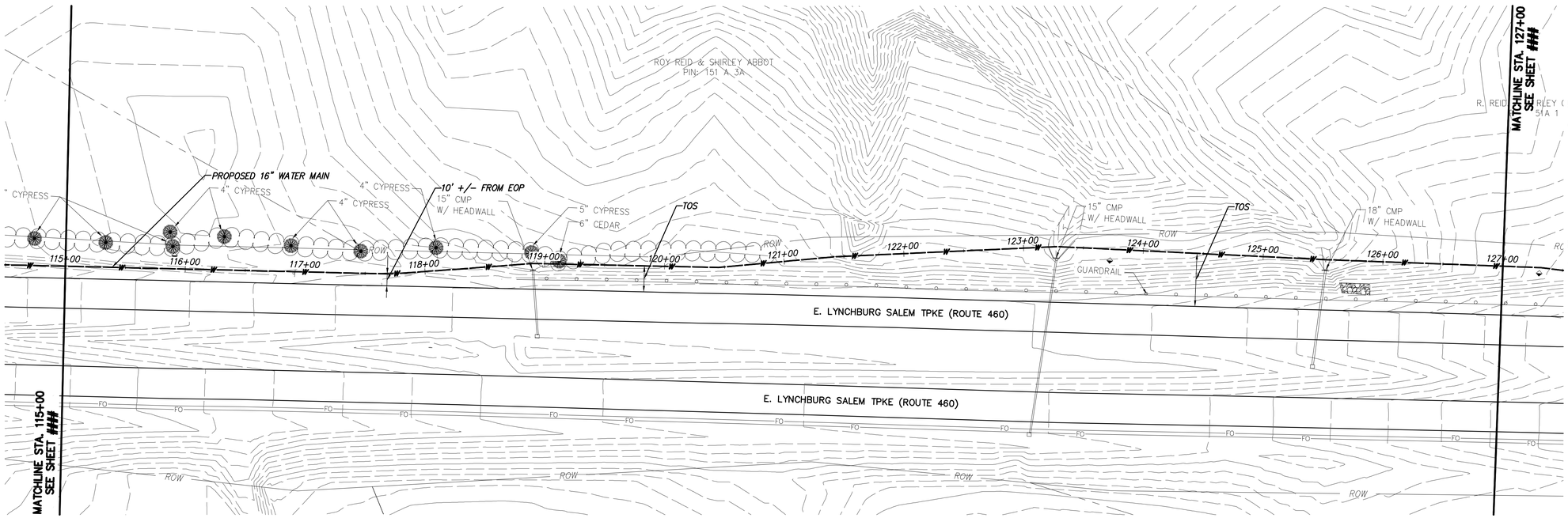
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-111
SHEET
OF

File: V:\PROJECTS\VAN\K3\27872\CADD_ACAD\C-50E-111-115_27872.DWG
Saved: 6/4/2015 7:28:28 AM Plotted: 6/4/2015 9:59:54 AM User: Ng, Kevin LastSavedBy: 4465

FD7000
D7000



WATER MAIN PLAN

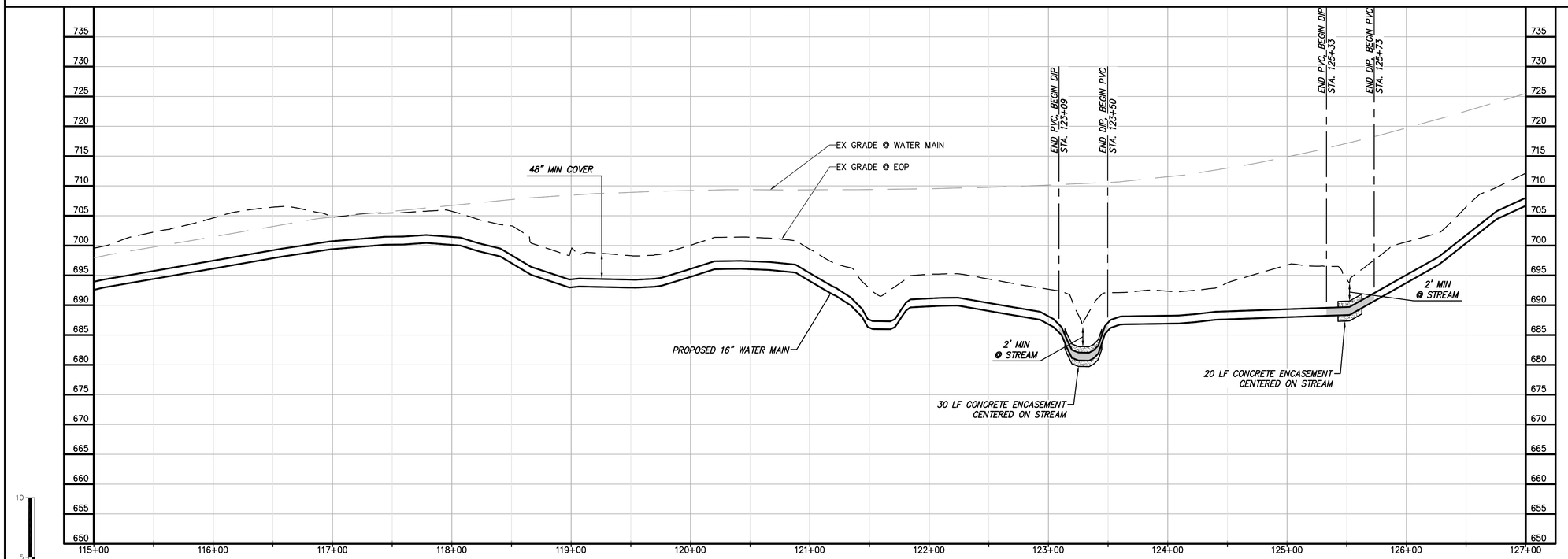
0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ——



WATER MAIN PROFILE

0 50 100
Scale in feet

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

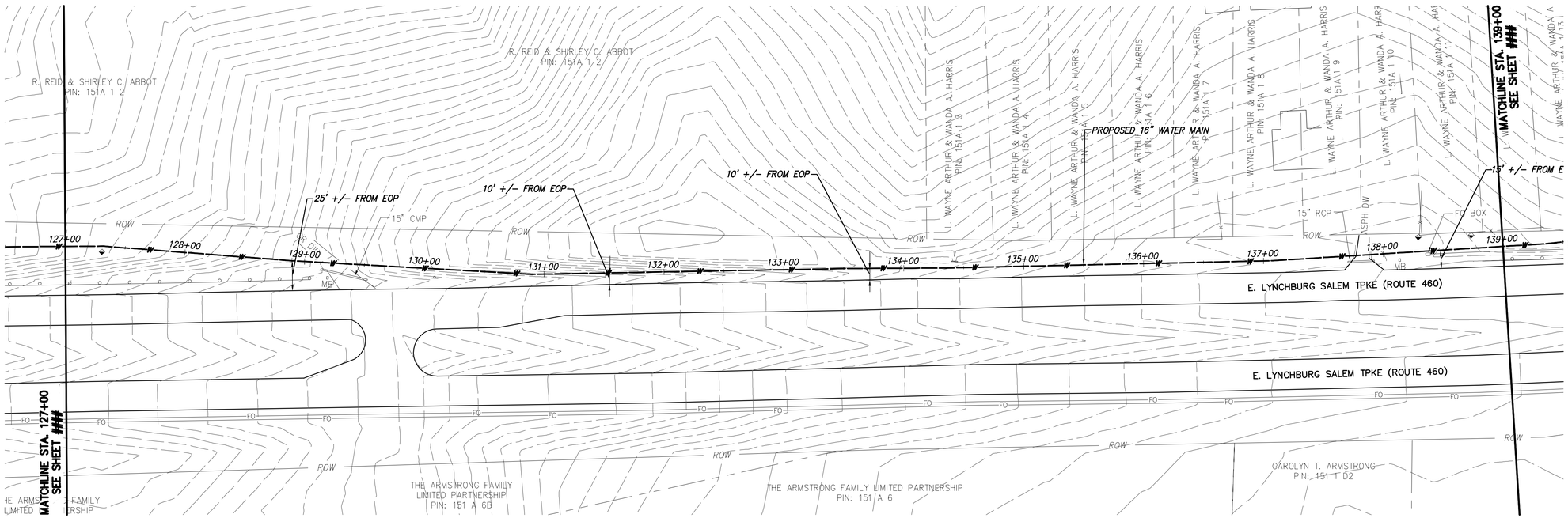
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-112
SHEET
OF

File: V:\PROJECTS\VAN\VK3\27872\CADD_ACAD\C-50E-111-115_27872.DWG
Saved: 6/4/2015 7:28:28 AM Plotted: 6/4/2015 10:00:28 AM User: Nq, Kevin LastSavedBy: 4465
FD7000
D7000



0 50 100
Scale in feet

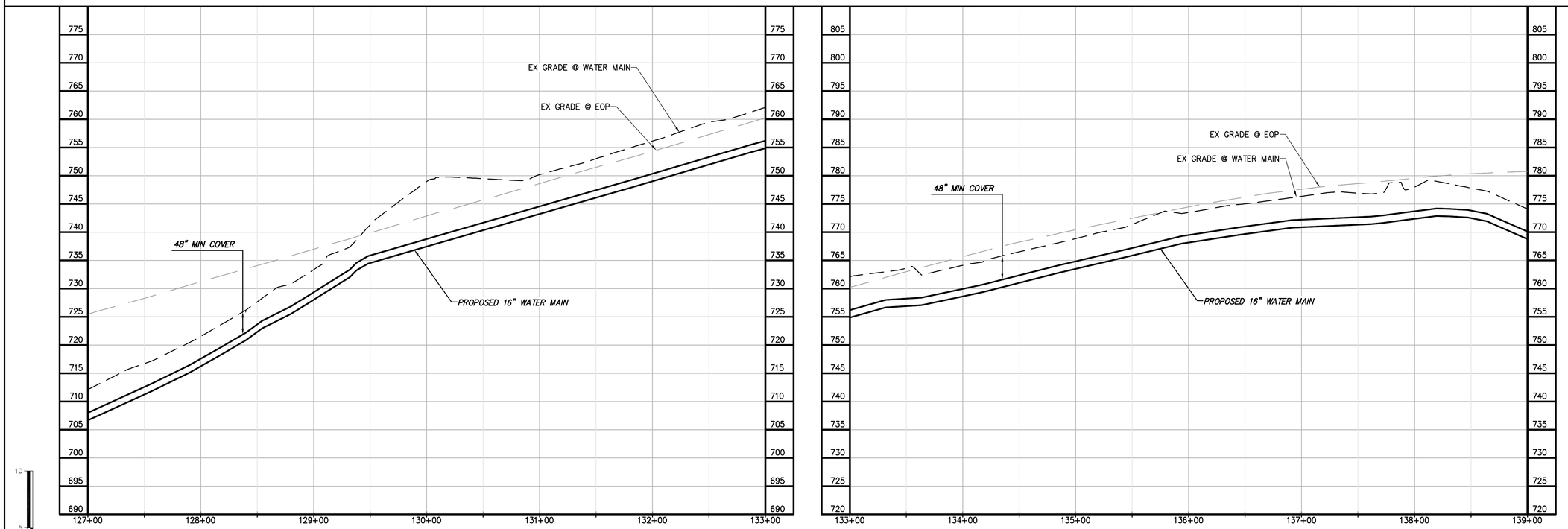
GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ____

WATER MAIN PLAN



10
5
0
0 50 100
Scale in feet

WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

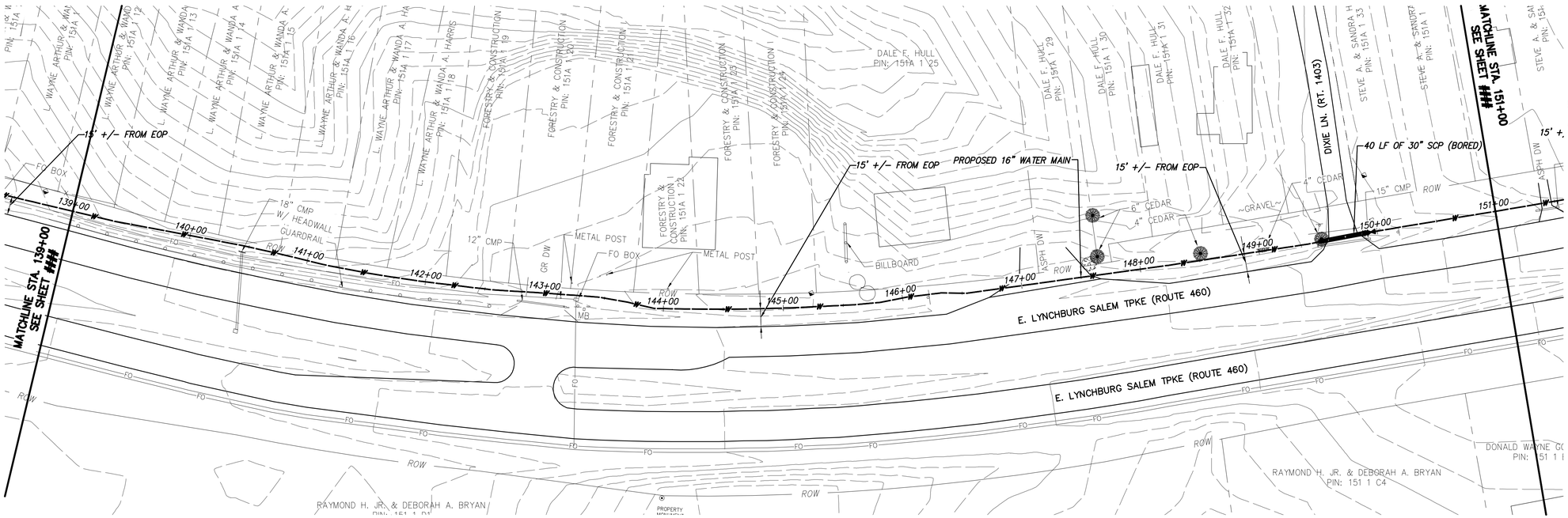
DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

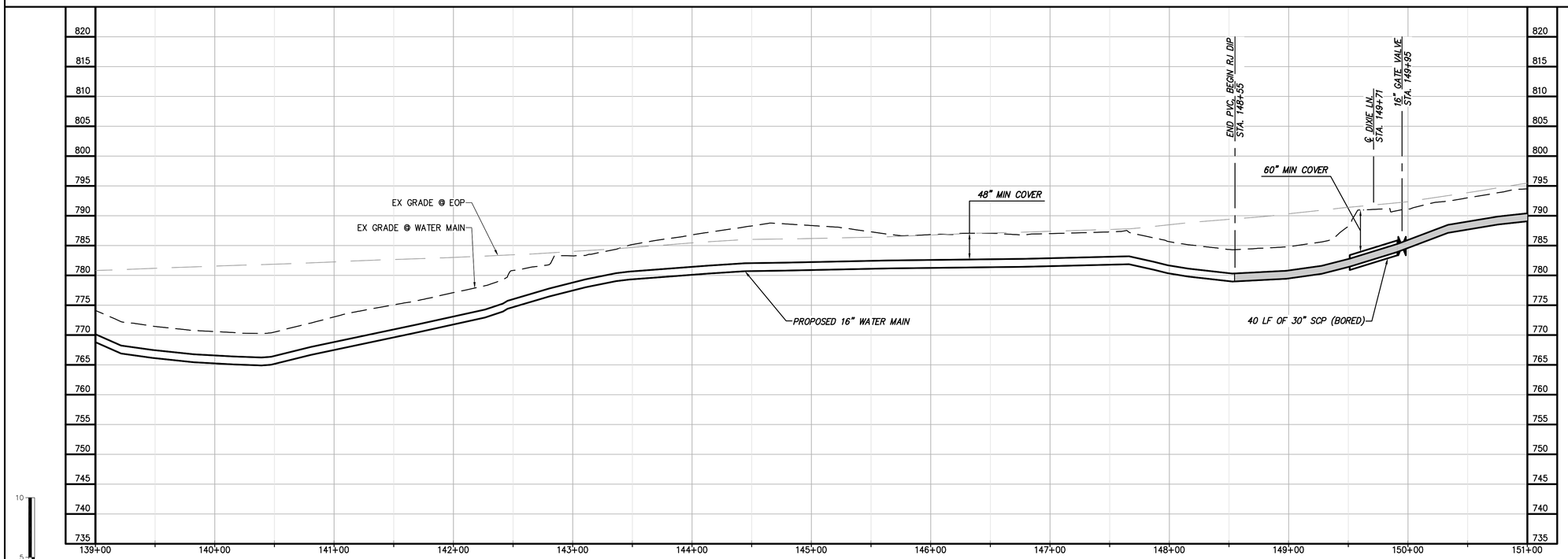
PROJECT NO.
27872

C-50E-113
SHEET
OF

File: V:\PROJECTS\VAN\X3\27872\CADD_ACAD\C-50E-111-115_27872.DWG
Saved: 6/4/2015 7:28:28 AM Plotted: 6/4/2015 10:01:09 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

0 50 100
Scale in feet

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

SAVED:
PLOTTED:
USER:
XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

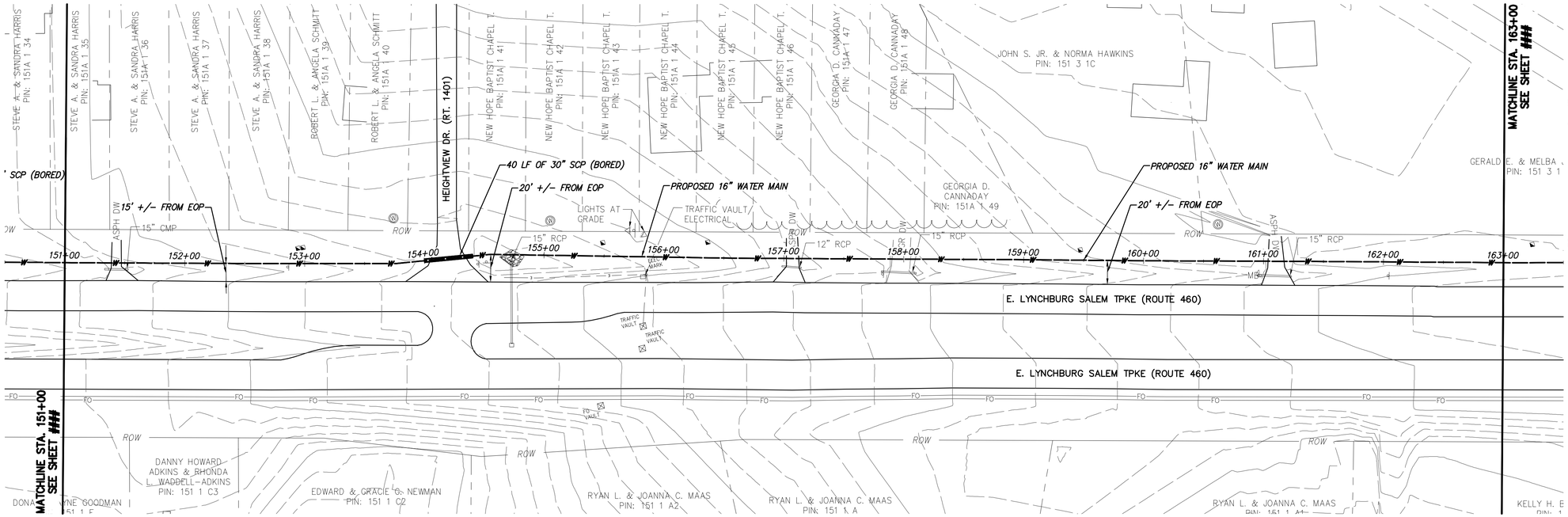
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

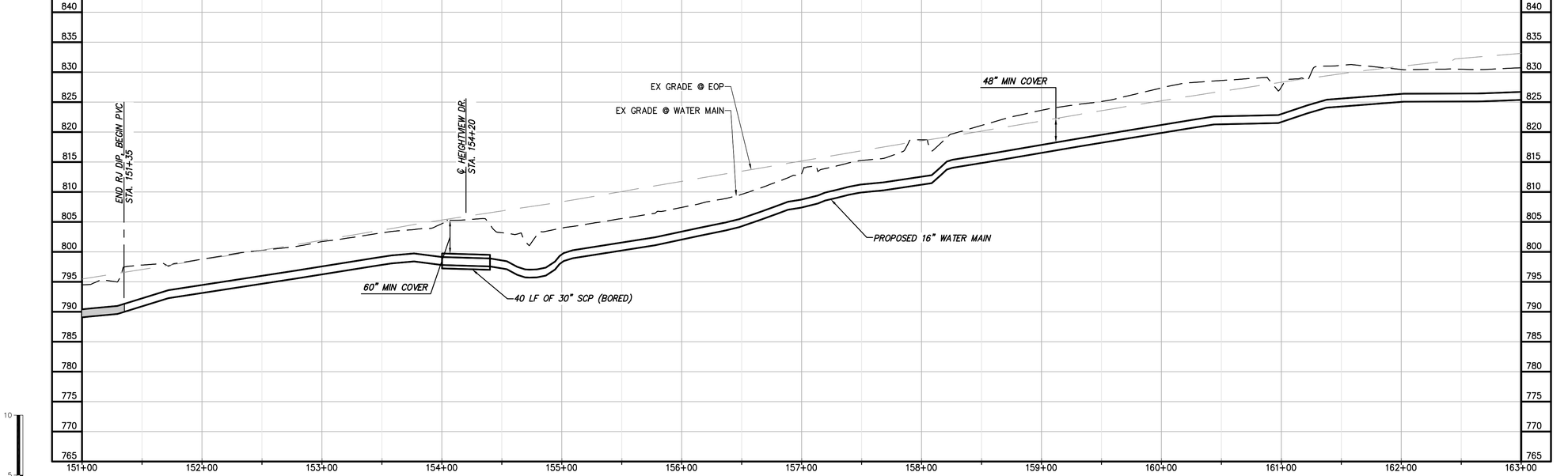
C-50E-114
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

File: V:\PROJECTS\VA\Y\X3\27872\CADD_ACAD\C-50E-111-115_27872.DWG
Saved: 6/4/2015 7:28:28 AM Plotted: 6/4/2015 10:01:42 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ____

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

DATE 6/4/2015

SAVED:
PLOTTED:
USER:

XREF1:
XREF2:
XREF3:
XREF4:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

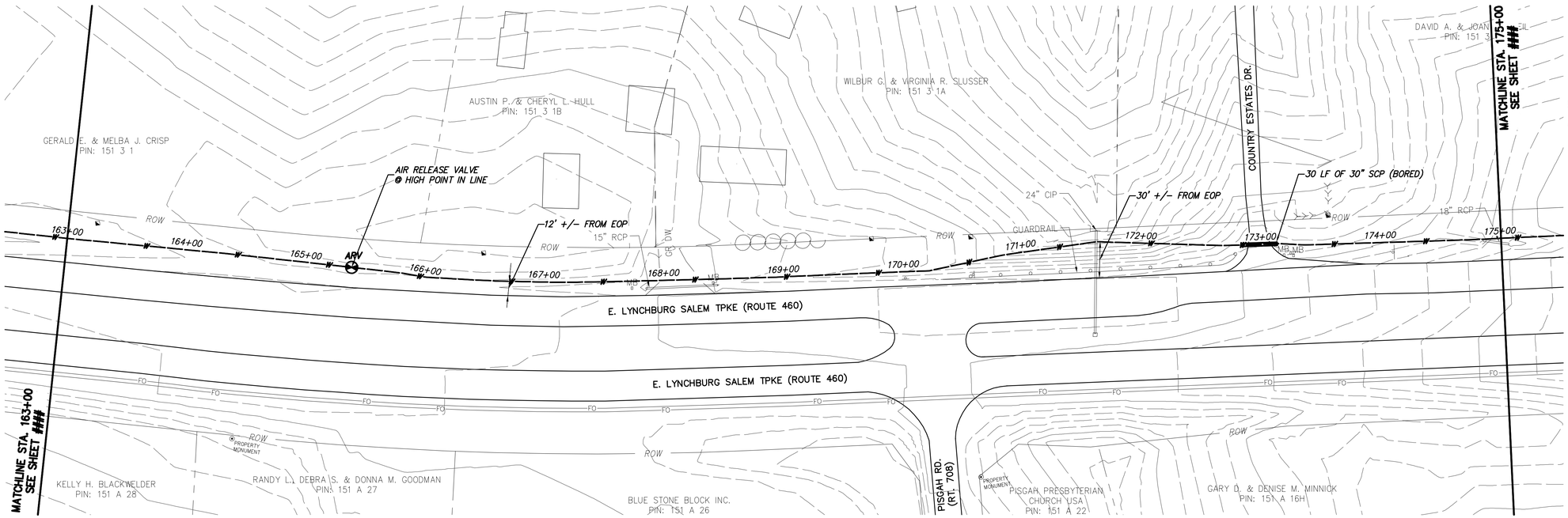
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

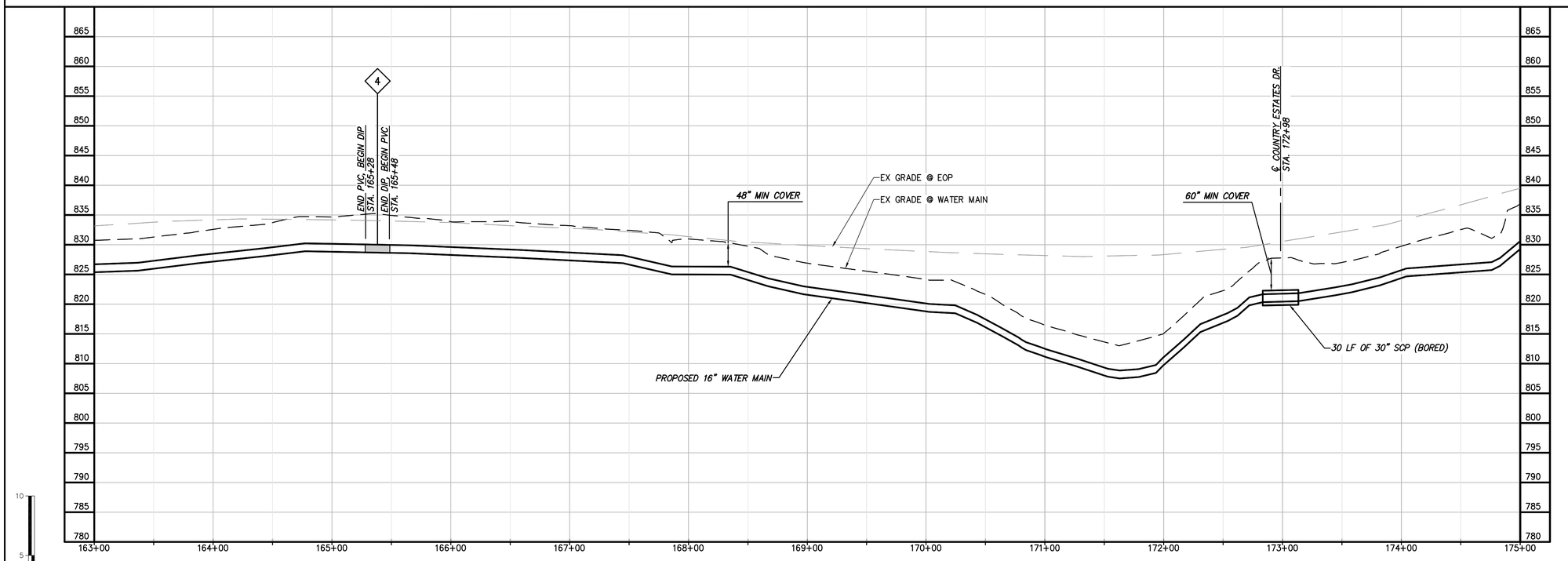
PROJECT NO.
27872

C-50E-115
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-111-115_27872.DWG
Saved: 6/4/2015 7:28:28 AM Plotted: 6/4/2015 10:02:15 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ____

PRELIMINARY - NOT FOR CONSTRUCTION

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

DATE	REVISIONS AND RECORD OF ISSUE
6/4/2015	LEVEL 3 DESIGN DOCUMENTS
	LEVEL 2 DESIGN DOCUMENTS

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

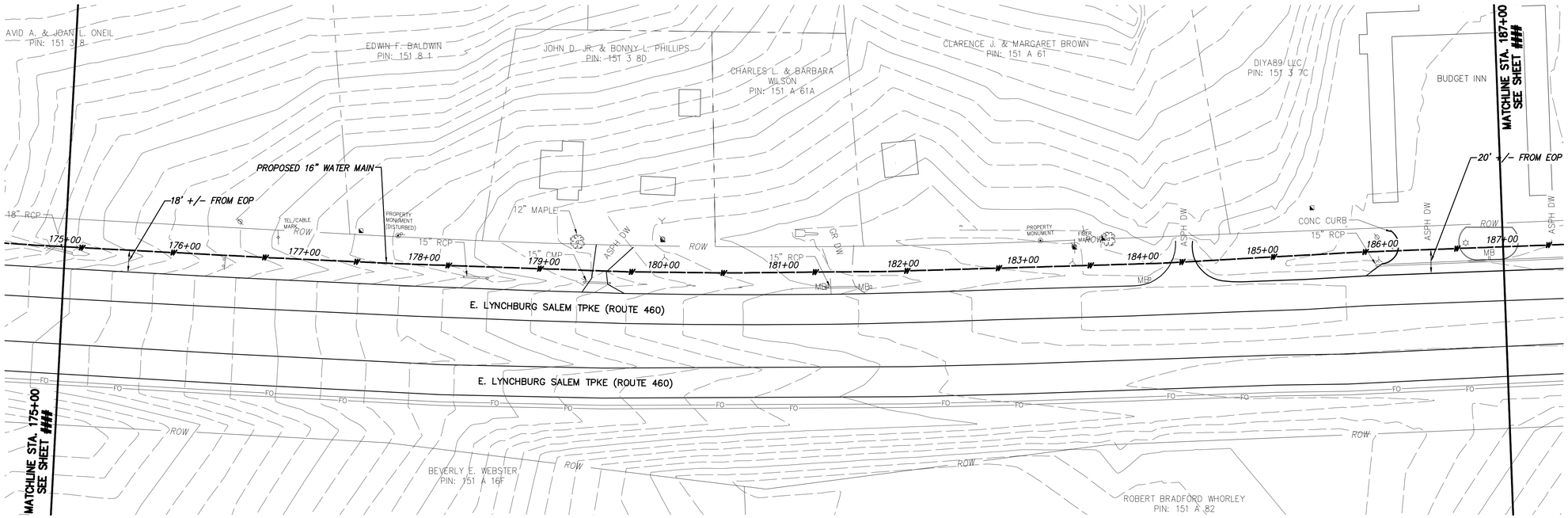
DESIGNED:	JRM
DETAILED:	SNP
CHECKED:	BSR
APPROVED:	SMS
DATE:	04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

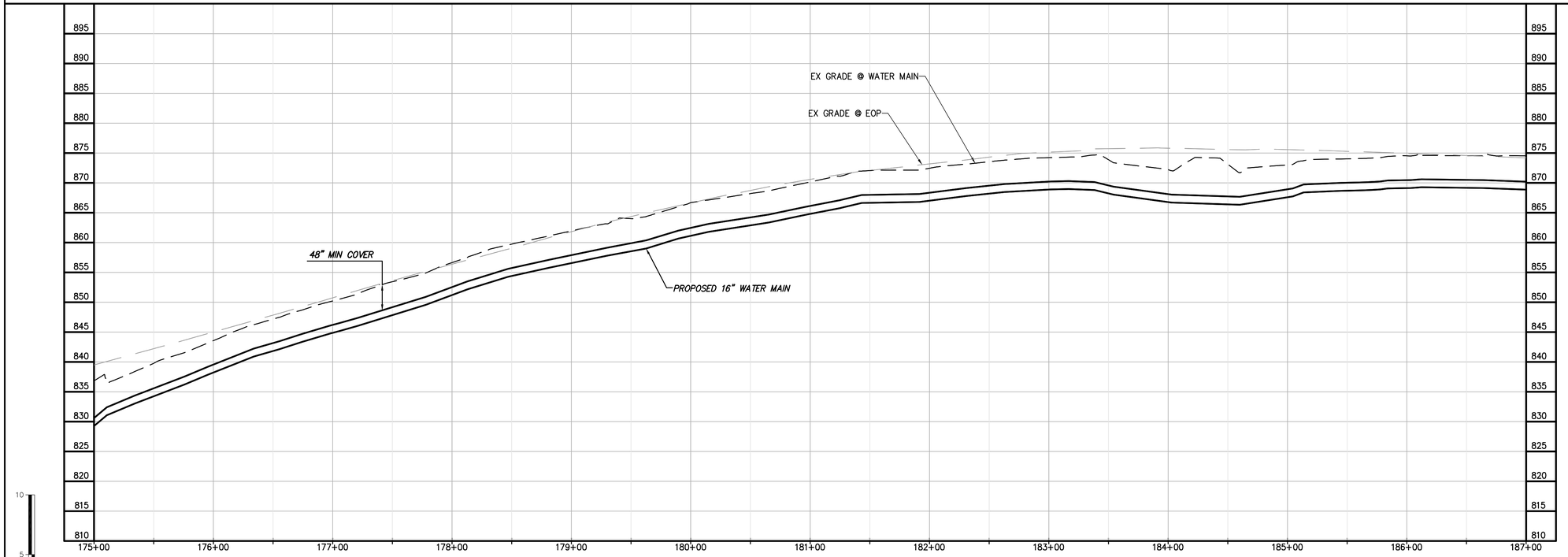
PROJECT NO.
27872

C-50E-116
SHEET
OF

File: V:\PROJECTS\VAY\K3\27872\CADD_ACAD\C-50E-116-120_27872.DWG
Saved: 6/4/2015 7:29:08 AM Plotted: 6/4/2015 10:03:31 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ____

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE
LEVEL 2 DESIGN DOCUMENTS
LEVEL 3 DESIGN DOCUMENTS
DATE
6/4/2015

SAVED:
PLOTTED:
USER:
DWG VER:
XREF1:
XREF2:
XREF3:
XREF4:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

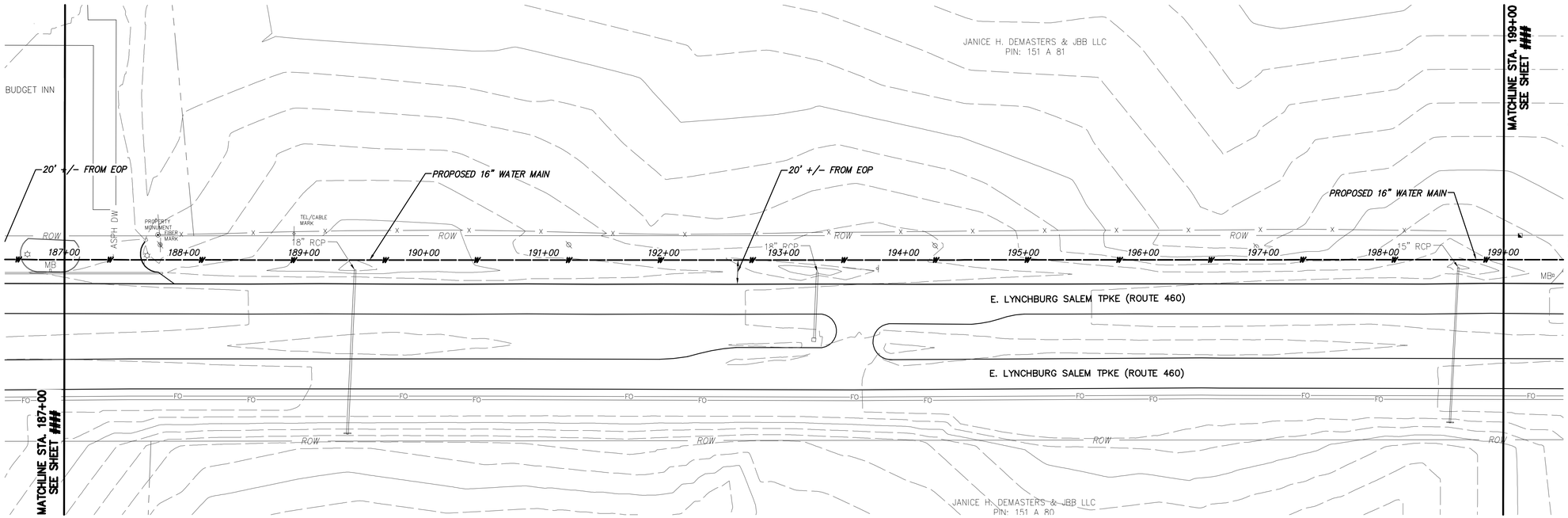
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

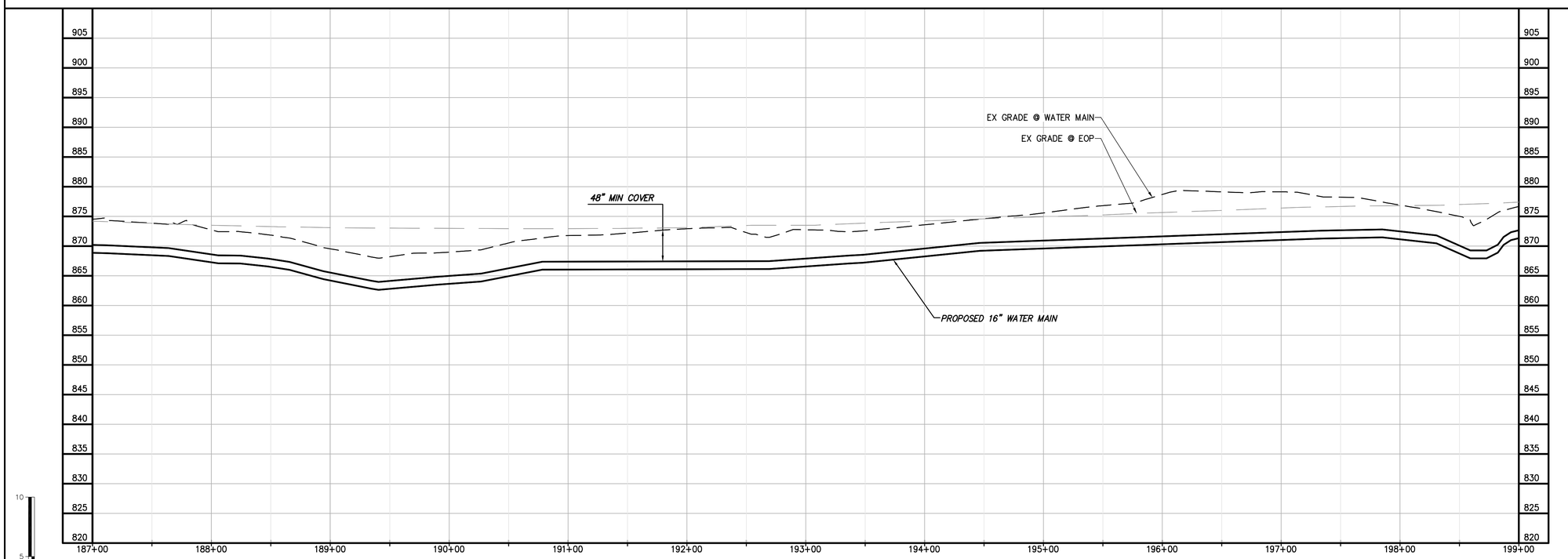
PROJECT NO.
27872

C-50E-117
SHEET
OF

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-116-120_27872.DWG
Saved: 6/4/2015 7:29:08 AM Plotted: 6/4/2015 10:04:03 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

REVISIONS AND RECORD OF ISSUE

LEVEL 2 DESIGN DOCUMENTS

LEVEL 3 DESIGN DOCUMENTS

6/4/2015

DATE

XREF1:
XREF2:
XREF3:
XREF4:

SAVED:
PLOTTED:
USER:
DWG VER:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-118
SHEET
OF

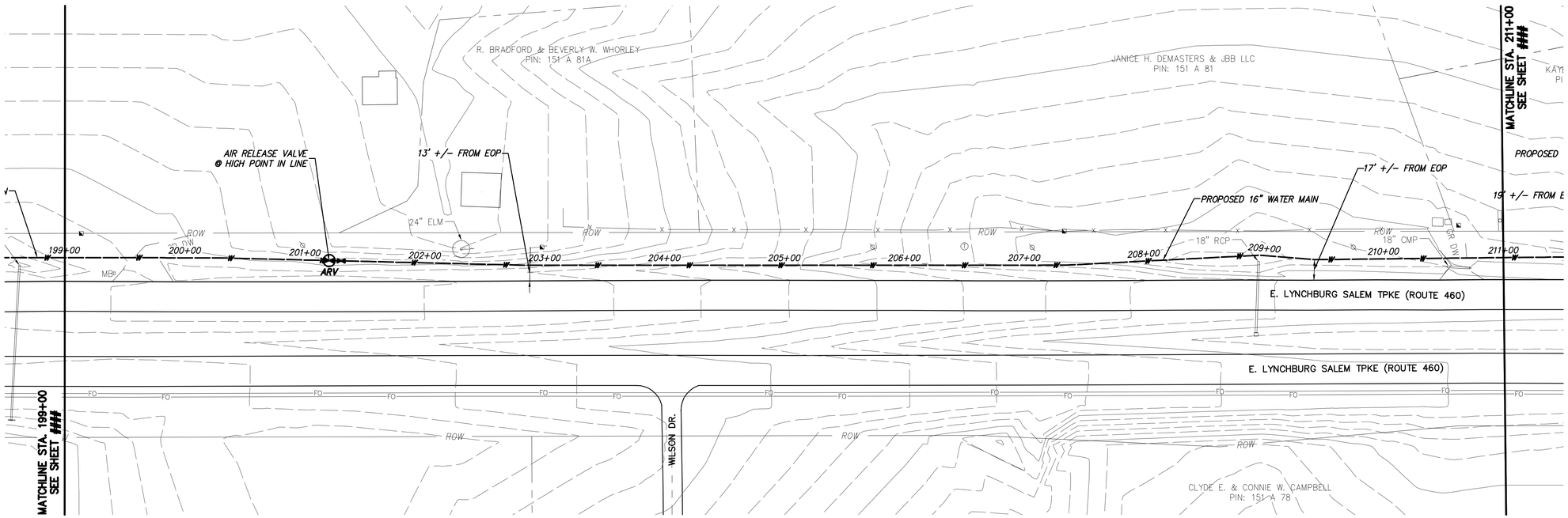
0 50 100
Scale in feet

10 5 0

0 50 100
Scale in feet

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-116-120_27872.DWG
Saved: 6/4/2015 7:29:08 AM Plotted: 6/4/2015 10:04:36 AM User: Ng, Kevin LastSavedBy: 4465

FD7000
D7000



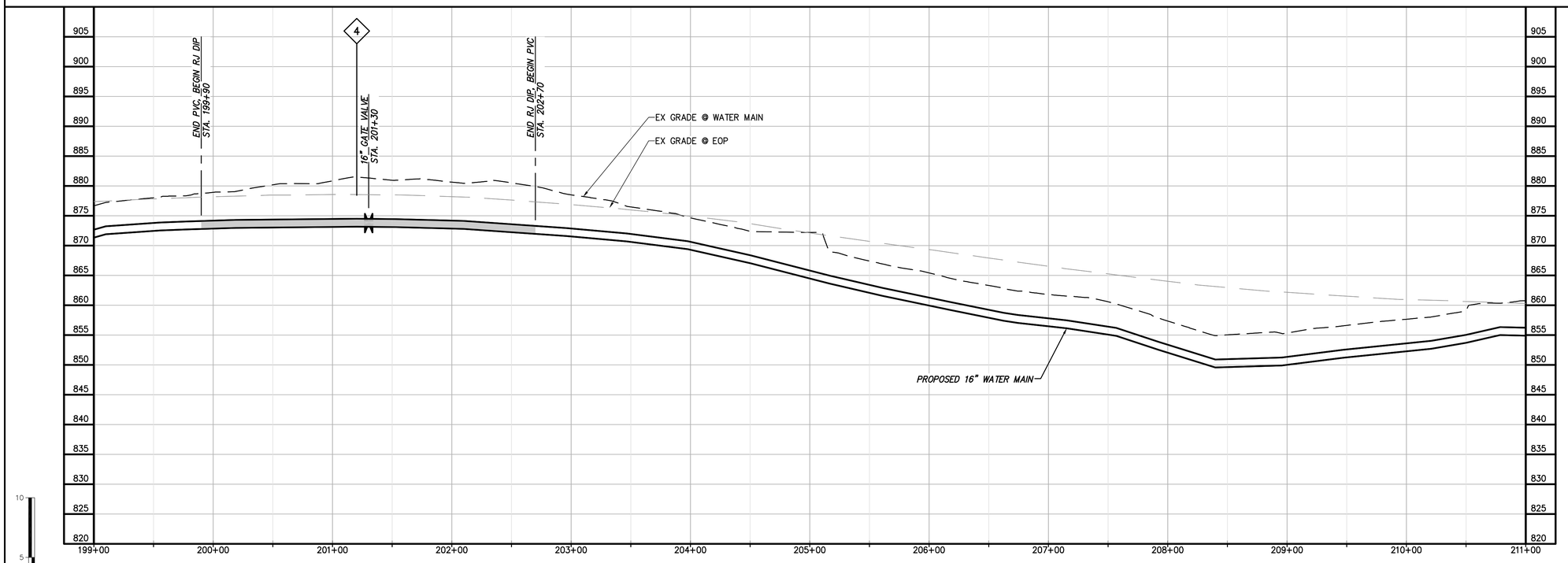
WATER MAIN PLAN

GENERAL NOTES:

A.

SPECIFIC NOTES

1 ——



WATER MAIN PROFILE

PRELIMINARY - NOT FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

NO.	BY	CK	APP
	SNP	JRM	SMS
	SNP	JRM	SMS

LEVEL 3 DESIGN DOCUMENTS
LEVEL 2 DESIGN DOCUMENTS
REVISIONS AND RECORD OF ISSUE
DATE
6/4/2015

XREF1:
XREF2:
XREF3:
XREF4:
SAVED:
PLOTTED:
USER:
DWG VER:

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

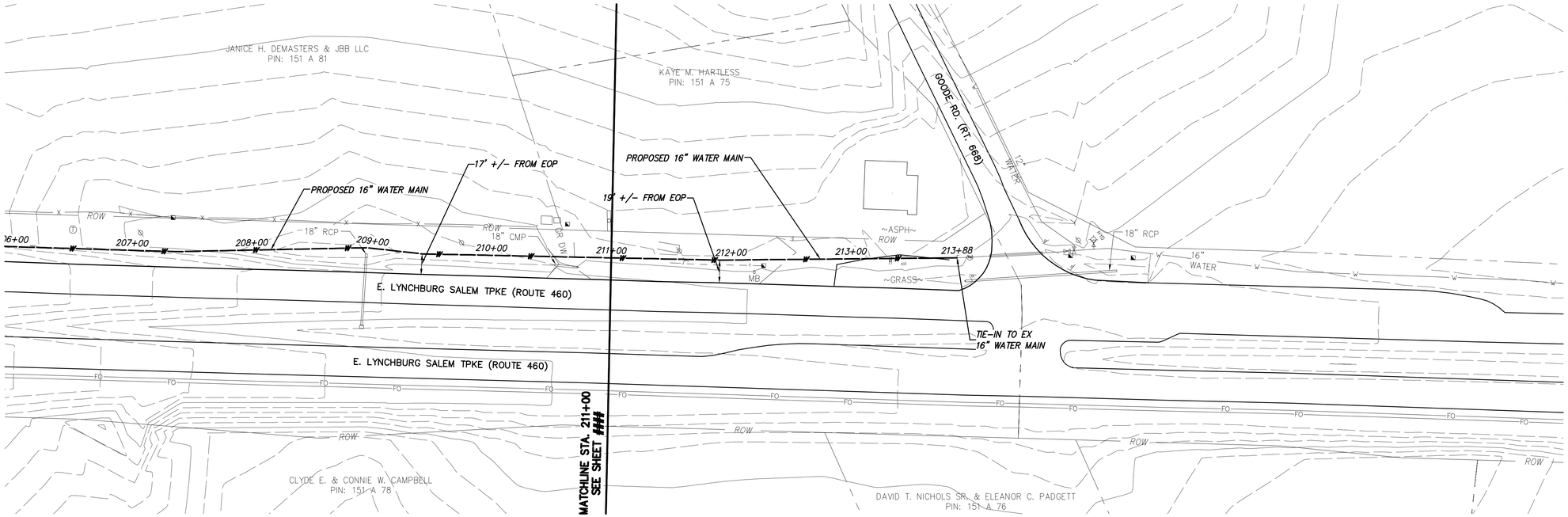
DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

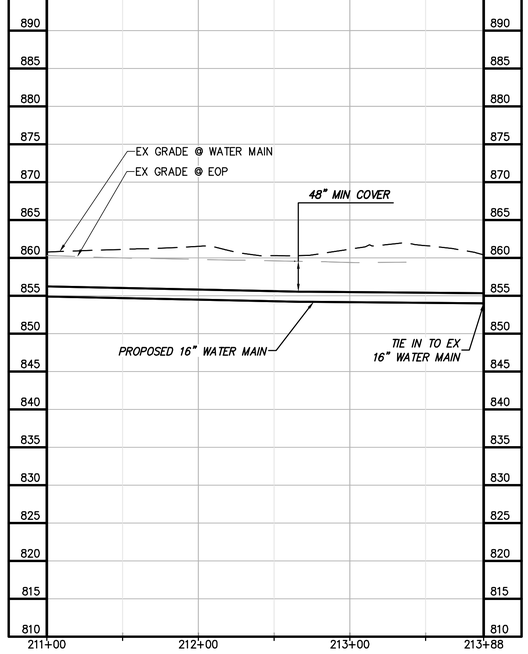
PROJECT NO.
27872

C-50E-119
SHEET
OF

File: V:\PROJECTS\VA\Y\K3\27872\CADD_ACAD\C-50E-116-120_27872.DWG
Saved: 6/4/2015 7:29:08 AM Plotted: 6/4/2015 10:05:08 AM User: Ng, Kevin LastSavedBy: 4465
FD7000
D7000



WATER MAIN PLAN



WATER MAIN PROFILE

0 50 100
Scale in feet

GENERAL NOTES:

A.

SPECIFIC NOTES

(1) ____

NO.	BY	CK	APP
REVISIONS AND RECORD OF ISSUE	SNP	JRM	SMS
LEVEL 2 DESIGN DOCUMENTS	SNP	JRM	SMS
LEVEL 3 DESIGN DOCUMENTS			
DATE			
6/4/2015			

SAVED: XREF1:
PLOTTED: XREF2:
USER: XREF3:
DWG VER: XREF4:

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5048 www.chacompanies.com

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP &
LAKES TO FOREST WATER LINE EXTENSION

CONTRACT E WATER MAIN - PLAN AND PROFILE

DESIGNED: JRM
DETAILED: SNP
CHECKED: BSR
APPROVED: SMS
DATE: 04-2015

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
27872

C-50E-120
SHEET
OF

PRELIMINARY - NOT FOR CONSTRUCTION

10 5 0
0 50 100
Scale in feet

File: V:\PROJECTS\ANY\K3\27872\CADD_ACAD\C-50E-116-120_27872.DWG
Saved: 6/4/2015 7:29:08 AM Plotted: 6/4/2015 10:05:40 AM User: Ng, Kevin LastSavedBy: 4465

FD7000
D7000