

CONTROL STATION
SCALE: 1"=20' HORIZ.

EXCAVATION, STABILIZATION AND BEDDING

- A. TRENCHING**
- EXCAVATION FOR TRENCHES SHALL INCLUDE THE REMOVAL OF ALL MATERIAL ENCOUNTERED REGARDLESS OF CLASSIFICATION IN ACCORDANCE WITH THE ELEVATIONS AND GRADES AT THE LOCATIONS AND STATIONS INDICATED ON THE PLANS OR SPECIFIED HEREIN.
 - EXCAVATION, UNLESS OTHERWISE SPECIFIED, SHALL BE OPEN CUT. THE CONTRACTOR SHALL OPEN NO MORE THAN TWO HUNDRED (200) FEET OF TRENCH AT ONE TIME DURING THE LAYING OF PIPE, UNLESS APPROVED BY THE ENGINEER.
 - TRENCHES SHALL BE EXCAVATED IN STRAIGHT LINES AND SHALL BE ACCURATELY GRADED IN ORDER TO ESTABLISH A TRUE ELEVATION FOR THE INVERT OF THE PIPE.
 - THE WIDTH OF TRENCHES, FROM EXISTING GRADE TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE OF SUFFICIENT WIDTH TO PERMIT THE PROPER INSTALLATION OF BRACING, SHORING OR SHEETING.
 - THE SIDES OF THE TRENCHES SHALL BE AS VERTICAL AS PRACTICAL.
 - EXCAVATION FOR STRUCTURES SHALL ALLOW A MINIMUM OF TWELVE (12) INCHES CLEAR BETWEEN THE STRUCTURE AND THE SIDES OF THE TRENCH OR ANY REQUIRED BRACING, SHORING OR SHEETING.
 - EXCAVATED MATERIALS SUITABLE FOR BACKFILL SHALL BE STOCKPILED IN AN ORDERLY MANNER AT A SUFFICIENT DISTANCE FROM THE SIDES OF THE TRENCH IN ORDER TO AVOID OVERLOADING THE BANKS OF THE TRENCH AND TO PREVENT SLIDES OR CAVE-INS.
 - EXCAVATED MATERIALS WHICH ARE NOT REQUIRED OR APPROVED FOR BACKFILL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR, AT HIS EXPENSE.
 - CONTRACTOR TO ADHERE TO ALL LOCAL, STATE AND FEDERAL CONSTRUCTION LAWS, INCLUDING OSHA TRENCH SAFETY REGULATIONS.
- B. TRENCH STABILIZATION**
- TRENCH STABILIZATION MATERIAL SHALL BE COARSE AGGREGATE SIZE NUMBER 2 AND SHALL CONFORM WITH VDOT SECTION 203 AND/OR ASTM C 33.
 - WHENEVER EXCESSIVELY WET OR UNSTABLE MATERIAL IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, WHICH IN THE OPINION OF THE ENGINEER IS INCAPABLE OF PROPERLY SUPPORTING THE PIPE OR STRUCTURES, SUCH MATERIAL SHALL BE REMOVED AND BACKFILLED WITH TRENCH STABILIZATION MATERIAL AND SHALL BE GRADED TO ALLOW FOR THE COMPACTED BEDDING MATERIAL.
 - ALL UNAUTHORIZED OVERDEPTHS OF EXCAVATION SHALL BE BACKFILLED, AT THE CONTRACTOR'S EXPENSE, WITH TRENCH STABILIZATION MATERIAL AND SHALL BE GRADED TO ALLOW FOR THE COMPACTED BEDDING MATERIAL.
- C. COMPACTED BEDDING MATERIAL**
- BEDDING MATERIAL SHALL BE COARSE AGGREGATE SIZE NUMBER 57 AND SHALL CONFORM WITH VDOT SECTION 203 AND/OR ASTM C 33.
 - THE BOTTOM OF THE PIPE TRENCH SHALL BE EXCAVATED TO A MINIMUM OVERDEPTH OF SIX (6) INCHES BELOW THE BOTTOM OF THE PIPE, TO PROVIDE FOR THE COMPACTED BEDDING MATERIAL. BEDDING MATERIAL SHALL BE PLACED, SHAPED AND COMPACTED.
 - BELL HOLES AND DEPRESSIONS REQUIRED FOR THE JOINTING OF THE PIPE SHALL BE DUG AFTER THE COMPACTED BEDDING MATERIAL HAS BEEN GRADED AND SHAPED AND SHALL BE ONLY OF THE LENGTH, DEPTH AND WIDTH REQUIRED TO MAKE THE JOINT PROPERLY.

PIPE, JOINTS AND FITTINGS

- A. SCOPE OF WORK**
- ALL MATERIALS AND APPURTENANCES REQUIRED FOR THE WORK SHALL BE NEW OR FIRST CLASS QUALITY AND SHALL BE FURNISHED, DELIVERED, ERECTED CONNECTED AND FINISHED IN EVERY DETAIL AS SPECIFIED OR INDICATED. ALL MATERIALS FOUND DEFECTIVE, REGARDLESS OF THE CIRCUMSTANCES, SHALL BE REPLACED WITH NEW MATERIAL AT THE EXPENSE OF THE CONTRACTOR.
 - THE MATERIALS SPECIFIED FOR THE CONSTRUCTION SHALL COMPLY WITH THE LATEST REVISIONS OF THE APPLICABLE AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN WATER WORKS ASSOCIATION (AWWA), AND/OR THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) STANDARDS.
- B. OPTIONAL PIPE SELECTIONS**
- THE CONTRACTOR SHALL INSTALL ONLY ONE (1) TYPE OF PIPE BETWEEN STRUCTURES EXCEPT WHERE DUCTILE IRON PIPE IS SPECIFIED OR INDICATED. WHERE EXISTING PIPE IS TO BE REPLACED OR EXTENDED THE SAME TYPE OF PIPE SHALL BE INSTALLED, UNLESS SPECIFIED OR INDICATED OTHERWISE.
 - WATER LINE SHALL BE EITHER PVC OR DUCTILE IRON.
- PIPE INSTALLATION**
- A. INSTALLING WATER MAINS**
- THE WATER MAIN SHALL BE LAID AND MAINTAINED AT THE REQUIRED LINES AND GRADES WITH FITTINGS AND VALVES AT THE REQUIRED LOCATIONS.
 - DEFLECTION OF THE LINE OF PIPE, IN EITHER, THE VERTICAL OR HORIZONTAL PLANE TO AVOID OBSTRUCTIONS, OR IN LOCATIONS WHERE LONG-RADIUS CURVES ARE REQUIRED, THE AMOUNT OF DEFLECTION SHALL NOT EXCEED APPROVED AWWA STANDARDS. ALIGNMENT THAT MAY REQUIRE DEFLECTION IN EXCESS OF THE RECOMMENDED LIMITATIONS, SPECIAL BENDS, OR A SUFFICIENT NUMBER OF SHORTER LENGTHS OF PIPE TO PROVIDE THE ANGULAR DEFLECTIONS WITHIN THE LIMITS AS SET FORTH, SHALL BE APPROVED BY THE ENGINEER.
 - ALL FLUES, EXCEPT MECHANICAL JOINT FLUES AT CONNECTIONS FOR WATER LINES, ALL TEES, AND ALL BENDS IN WATER MAINS UNDER PRESSURE SHALL BE PROVIDED WITH REACTION BACKING CONSISTING OF CONCRETE THRUST BLOCKS. VALVES FOR CONNECTIONS TO FUTURE LINES AND FIRE HYDRANTS SHALL BE ANCHORED TO THE WATER MAIN WITH THE ROADS.
 - DETECTION TAPE TO BE INSTALLED 12"-18" ABOVE ALL NEW PVC WATER LINES.
- B. DISINFECTION OF WATER MAINS**
- ALL PIPE SHALL BE DISINFECTED, TESTED AND FLUSHED IN ACCORDANCE WITH AWWA STANDARD C601 (LATEST REVISION).
 - CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, NECESSARY TAPS AND PERFORM ALL WORK REQUIRED FOR THE STERILIZATION, TESTING AND FLUSHING OF THE WATER MAIN.
 - NO TESTED SECTION OF WATER LINE SHALL BE APPROVED TO DELIVER WATER SERVICE UNTIL A FAVORABLE LABORATORY REPORT HAS BEEN ACHIEVED. ANY TESTED SECTION OF WATER LINE FAILING TO MEET THE REQUIREMENTS SPECIFIED SHALL BE REQUIRED BY THE CONTRACTOR AND RETESTED UNTIL THE RESULTS ARE WITHIN THE LIMITS SPECIFIED.
 - THE WATER MAIN OR VALVED OFF SECTION THAT HAS BEEN COMPLETED SHALL BE FILLED, TESTED AND FLUSHED. TEST LOCATIONS SHALL BE SUBJECT TO THE DISCRETION OF THE ENGINEER AND AS VALVES AND BLOW-OFFS PERMIT.
 - AFTER TESTING AND BEFORE FINAL INSPECTION OF THE COMPLETED SYSTEMS, WATER MAINS AND SERVICE LATERALS SHALL BE FLUSHED AND DISINFECTED IN ACCORDANCE WITH AWWA SPECIFICATIONS C601 (LATEST REVISION). FLUSHING SHALL BE ACCOMPLISHED AT A FLOW VELOCITY OF NOT LESS THAN 2.5 FEET PER SECOND.

DISINFECTION AS DESCRIBED IN AWWA C651 - "PLACING OF CALCIUM HYPOCHLORITE TABLETS" SHALL BE USED. 5 GRAM CALCIUM HYPOCHLORITE TABLETS WITH 3.25 GRAM AVAILABLE CHLORINE PER TABLET SHALL BE ATTACHED AT THE INSIDE TOP OF THE PIPE BY AN ADHESIVE SUCH AS PERMATEX NO. 2 OR EQUAL. THE FOLLOWING NUMBER OF TABLETS FOR THE GIVEN PIPE SIZE SHALL BE USED FOR AN INITIAL DOSE OF 25 MG/L (PPM) CHLORINE:

PIPE DIAMETER	NUMBER TABLETS PER 18-20 FT. PIPE SECTION
6"	1
8"	2
10"	3
12"	4
16"	7

OR THE NUMBER OF TABLETS EQUAL TO 0.001202L ROUNDED TO THE NEXT HIGHER INTEGER, WHERE D IS THE INSIDE DIAMETER, IN INCHES AND L IS THE LENGTH OF THE PIPE SECTION, IN FEET. USE OF THE CONTINUOUS FEED OR SLOG METHOD OF DISINFECTION MAY ONLY BE USED TO RE-CHLORINATE A WATER PIPE AFTER THE INITIAL DISINFECTION OR IN OTHER SPECIFIC CASES APPROVED BY THE DESIGN ENGINEER. WHEN FILLING THE PIPELINE FOR DISINFECTION, THE RATE OF FILLING MUST RESULT IN A VELOCITY OF LESS THAN 1 FT./SEC.

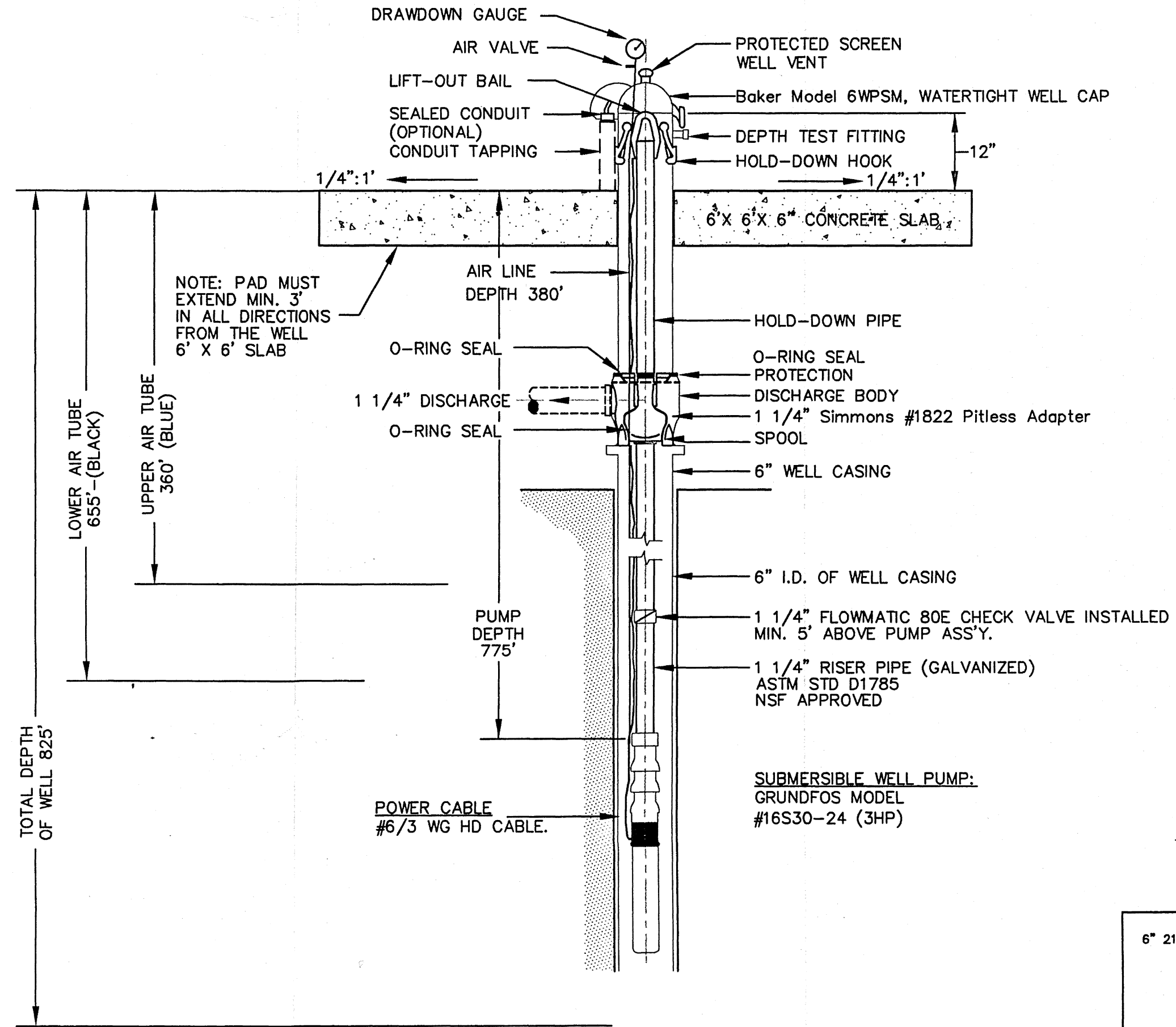
THE DISINFECTION SOLUTION SHALL REMAIN IN THE PIPE LINE FOR NOT LESS THAN TWENTY-FOUR (24) HOURS, AFTER WHICH TIME A CHLORINE RESIDUAL OF 10 PPM AT ALL PARTS OF THE LINE SHALL BE REQUIRED.

FOLLOWING CHLORINATION, THE PIPING SHALL BE THOROUGHLY FLUSHED. THE VIRGINIA WATERWORKS REGULATIONS REQUIRE AT LEAST TWO CONSECUTIVE SATISFACTORY BACTERIOLOGICAL SAMPLES AT 24 HOUR INTERVALS FROM THE DISTRIBUTION SYSTEM AT MAXIMUM SPACING OF 2000 FEET BEFORE THE SYSTEM CAN BE PLACED IN SERVICE. IF THE INITIAL TESTING IS NOT SATISFACTORY THE NEW LINES WILL BE RETESTED UNTIL SATISFACTORY RESULTS ARE ACHIEVED. THE CONTRACTOR SHALL PAY ALL COSTS ASSOCIATED WITH DISINFECTION AND TESTING OF INSTALLED FACILITIES INCLUDING ANY BACTERIOLOGICAL SAMPLES AND RETESTING IF REQUIRED. SAMPLES WILL BE COLLECTED IN ACCORDANCE WITH THE VIRGINIA WATERWORKS REGULATIONS.

BACKFILL

- BACKFILL FROM THE TOP OF THE PIPE BEDDING OR BOTTOM OF THE PIPE TRENCH TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE FREE OF STONES LARGER THAN ONE (1) INCH IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED SIX (6) INCHES AND COMPACTED WITH HAND OPERATED TAMPERS.
- BACKFILL FROM ONE (1) FOOT ABOVE THE TOP OF THE PIPE TO THE TOPSOIL SUBGRADE SHALL BE FREE OF STONES LARGER THAN FIVE (5) INCHES IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED TWELVE (12) INCHES AND COMPACTED WITH MECHANICAL TAMPERS.
- DRAINAGE CHANNELS TO BE CONSTRUCTED OF FILL MATERIAL SHALL BE GRADED AND SHAPED TO THE TOPSOIL SUBGRADE WITH MATERIAL FREE OF STONES LARGER THAN FOUR (4) INCHES IN DIAMETER AND SHALL BE PLACED IN LAYERS NOT TO EXCEED EIGHT (8) INCHES AND COMPACTED WITH MECHANICAL TAMPERS.

IN WHICH L IS THE ALLOWABLE LEAKAGE, IN GALLONS PER HOUR; S IS THE LENGTH OF PIPELINE TESTED IN FEET; D IS THE NOMINAL DIAMETER OF THE PIPE, IN INCHES; AND P IS THE AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH GAUGE. WHEN TESTING AGAINST CLOSED METAL-SEATED VALVES, AN ADDITIONAL LEAKAGE PER ENCLOSED VALVE OF 0.0078 GAL/HR/IN. OF NOMINAL VALVE SIZE SHALL BE ALLOWED. WHEN HYDRANTS ARE IN THE TEST SECTION, THE TEST SHALL BE MADE ON THE BASIS OF ALLOWABLE LEAKAGE. IF ANY TEST OF PIPE LAID DISCLOSES LEAKAGE GREATER THAN THE ALLOWABLE AMOUNT, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE AND REPAIR THE DEFECTIVE MATERIAL UNTIL THE LEAKAGE IS WITHIN THE SPECIFIED ALLOWANCE. ALL VISIBLE LEAKS ARE TO BE REPAIRED REGARDLESS OF THE AMOUNT OF LEAKAGE.



WELL NO. 3 DETAIL/SPECIFICATIONS
NTS

SUMMARY WELL NO. 3
STATIC WELL LEVEL: 90'
DRAWDOWN: 620' @ 5 GPM
BACTERIOLOGICAL QUALITY: MPN AVG. <2 FECAL 0
CHLORINATION: NOT REQUIRED

ELEVATIONS
TANK OVERFLOW: 1008.2'
WELL HEAD: 948.0'
TOTAL ELEV. HEAD: 60.2'
WELL DRAWDOWN: 620.0'

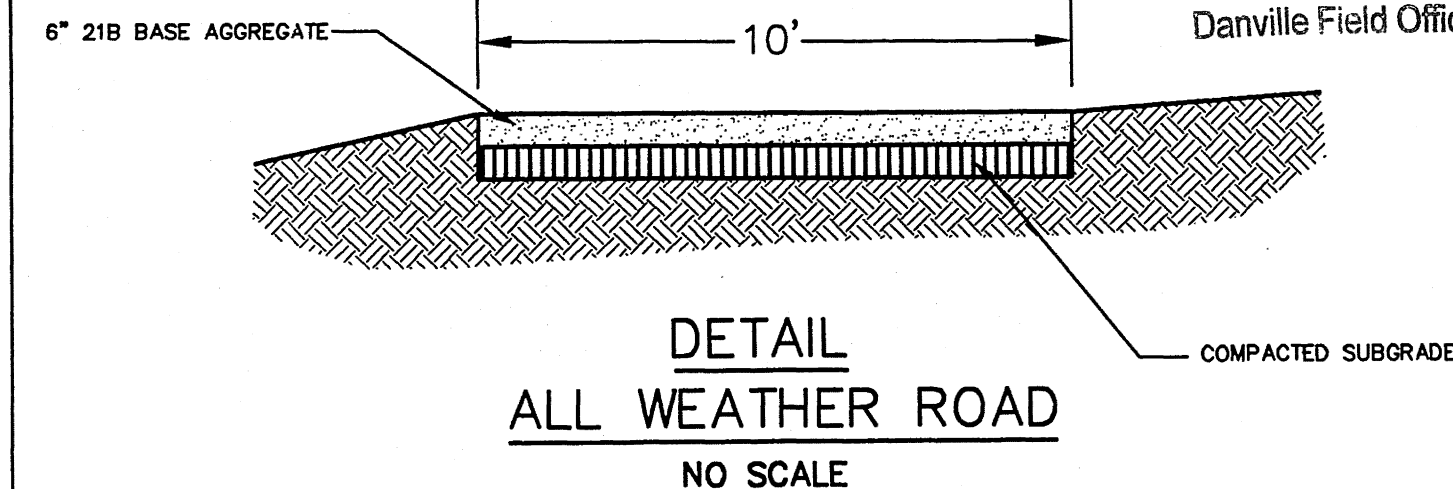
PITLESS UNIT:
SIMMONS MODEL #1822

WELL PUMP:
GRUNDFOS MODEL 16530-24 (3HP)

EQUIPMENT REQUIRED	MANUFACTURER	MODEL NUMBER
WATER METER	BADGER	MODEL 70 (1")
WELL CAP	BAKER	6WPSM WT
WELL PUMP CONTROL	ALLEN BRADLEY	836C3

TEST KIT:
CHLORINATOR: NOT REQUIRED
WELL PUMP CONTROLS: STORAGE TANK LEVEL CONTROLLED BY PRESSURE SWITCH, KOBOLD MODEL SEN8700, TURNING WELL PUMP ON/OFF AS REQUIRED.
SWITCHES: HAND-OFF-AUTO SWITCH SHALL BE PROVIDED.
ELECTRIC LIGHTS: SINGLE INCANDESCENT BULB.

- NOTES:**
- DISINFECTION PROCEDURES SHALL BE IN ACCORDANCE WITH AWWA C652 AND SECTION 12 VAC 5-590-1210 OF THE VIRGINIA STATE BOARD OF HEALTH & WATER REGULATIONS.
 - DISINFECTANT - FREE CHLORINE
LIQUID CHLORINE MUST MEET ANSI/AWWA B300 PRIOR TO SERVICE. TWO BACTERIOLOGICAL TESTS, 24 HOURS APART, MUST BE TAKEN AND RESULTS MUST SHOW THAT SYSTEM HAS BEEN DISINFECTED PRIOR TO SYSTEM BEING PUT INTO SERVICE.
 - ALL PIPING, TO WELL, BOTH NEW AND SECTIONS TO BE REPLACED, SHALL BE 1 1/4" SCH. 80 PVC.
 - ALL PIPING SHALL CONFORM TO ASTM 1785.



DETAIL
ALL WEATHER ROAD
NO SCALE

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L M W P C

Engineering
Architecture
Surveying
Landscape Design

**WALNUT RUN
WATER WORKS
WELL # 3**
FRANKLIN COUNTY VIRGINIA

NO.	DATE	DESCRIPTION	BY

**WATER LINE
DETAILS**

Designed By **JDK**
Drawn By **JDK**
Checked By **RCW**
Approved By **RCW**
Submitted By **RCW**
Drawing **2864A**
Date **05/26/04**
Scale **AS NOTED**
Commission No. **2864**

Sheet **2** of **2**