

B 1 **6761**
 1 2 3 6
 SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND
 APPLICATION FOR PERMIT TO DRILL WELL
 533 211 please type

STATE PERMIT NUMBER
Ho-95-1900
 70 fill in this form completely 79

Date Received (APA)
 OWNER INFORMATION
 8 MM DD YY 13
 Howard County, Md
 15 Last Name Owner First Name 34
 8950 Rt 108 Roman Playa
 36 Street or RFD 55
 Columbia Md 21045
 57 Town 70 State 72 Zip 76

DRILLER INFORMATION
 Marshal Arnette M S D 106
 Driller's Name 76 License No. 81
 Allied Environmental Services
 Firm Name
 PO Box 1242, Millersville, Md 21108
 Address
 Signature Date 4/23/10

B 2 WELL INFORMATION
 1 2 APPROX. PUMPING RATE (GAL. PER MIN.)
 8 12
 AVERAGE DAILY QUANTITY NEEDED (GAL. PER DAY)
 14 20

USE FOR WATER (CIRCLE APPROPRIATE BOX)
 DOMESTIC POTABLE SUPPLY & RESIDENTIAL IRRIGATION
 FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION)
 INDUSTRIAL, COMMERCIAL, DEWATERING
 PUBLIC WATER SUPPLY WELL
 TEST, OBSERVATION, MONITORING
 GEO-THERMAL
 10 Closed Loops

APPROXIMATE DEPTH OF WELL 350 FEET
 APPROXIMATE DIAMETER OF WELL 6 INCH NEAREST INCH

METHOD OF DRILLING (circle one)
 BORED (or Augered) JETTED Jetted & DRIVEN
 30 AIR-ROTary AIR-PERCussion ROTARY (Hydraulic Rotary)
 37 CABLE REVERSE-ROTary DRIVE-POINT
 other

REPLACEMENT OR DEEPEMED WELLS (CIRCLE APPROPRIATE BOX)
 THIS WELL WILL NOT REPLACE AN EXISTING WELL
 THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED
 THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY-CONTACT LOCAL APPROVING AUTHORITY FOR POLICY ON STANDBY WELLS
 THIS WELL WILL DEEPEM AN EXISTING WELL
 PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEMED (IF AVAILABLE) 41 _____ 52

Not to be filled in by driller (MDE OR COUNTY USE ONLY)
 APPROX. PERMIT NUMBER _____ G _____
 PERMIT No. Ho-95-1900
 70 71 72 73 74 75 76 77 78 79

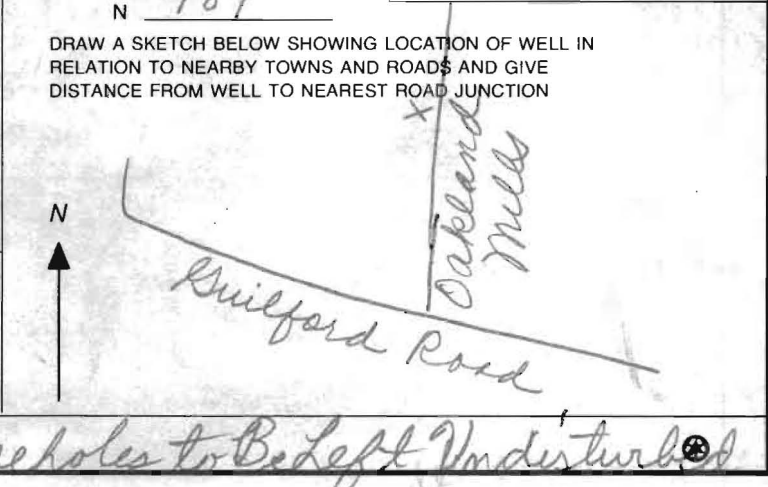
SPECIAL CONDITIONS
 NOTE - APPROVING AUTHORITIES SHOULD USE SEPARATE SHEET IF NEEDED
 Drilling Area/Boreholes to Be Left Undisturbed

B 3 LOCATION OF WELL
 Howard
 8 COUNTY 21
 Guilford Gardens
 23 SUBDIVISION 42
 SECTION Par A2 LOT A2
 44 46 48 50
 Columbia
 52 NEAREST TOWN 71
 MILES FROM TOWN (enter 0 if in town) 0 M I
 73 76 77 78

B 4 DIRECTION OF WELL FROM TOWN (CIRCLE BOX)
 1 2
 11 NEAR WHAT ROAD 30
 ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX)
 34 500 37
 DISTANCE FROM ROAD
 ENTER FT OR MI 38 39
 TAX MAP: 42 BLK: 11 PARCEL 361

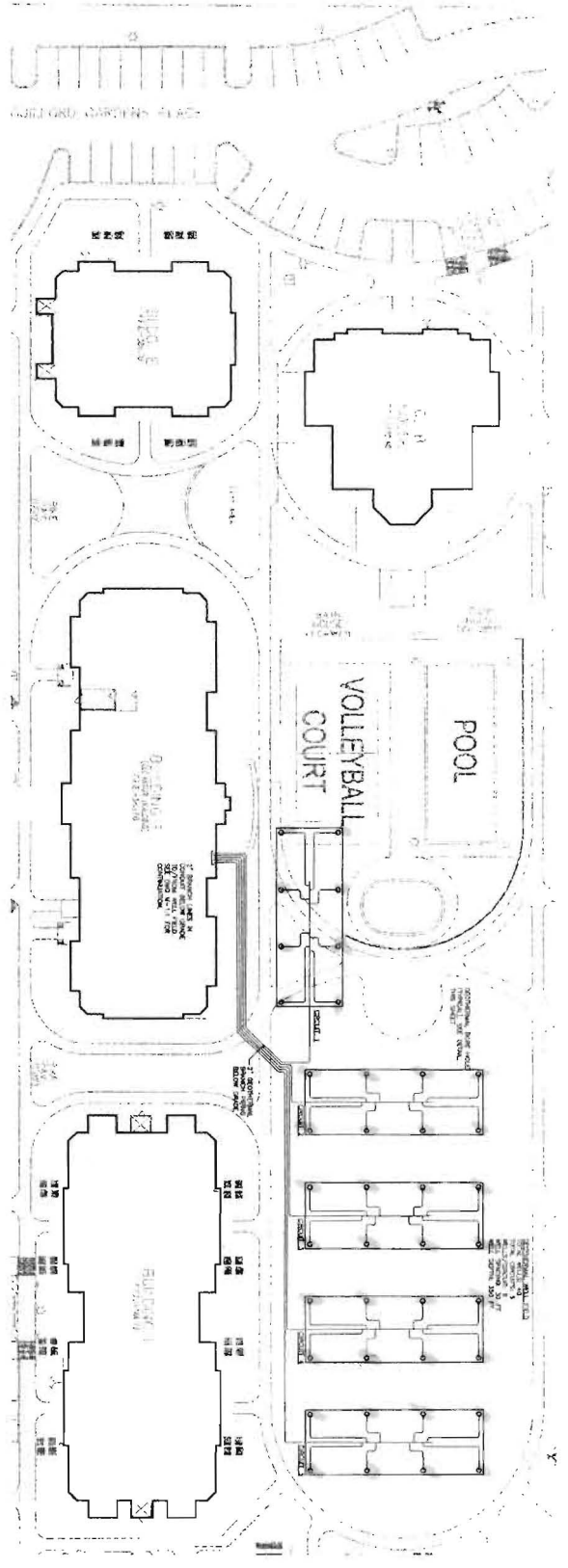
NOT TO BE FILLED IN BY DRILLER HEALTH DEPARTMENT APPROVAL
 Howard (13) Public
 COUNTY NAME COUNTY NO.
 STATE SIGNATURE INSERT S →
 DATE ISSUED 5/7/2010
 43 MM DD YY 48 CO SIGNATURE EXP. DATE
 NORTH GRID 487 0 0 0 EAST GRID 848 0 0 0
 50 55 57 63

SHOW MAJOR FEATURES OF BOX & LOCATE WELL WITH AN X
 SOURCES OF DRILLING WATER
 1. Driller Well (X)
 2.
 3.
 WRITE THE BOX NUMBER FROM THE MAP HERE
 E 848
 N 487
 000
 000



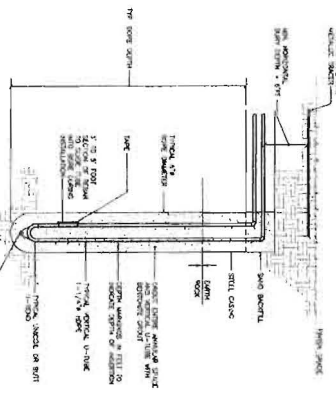
4/1/10

2208 2283 7213-7333



MECHANICAL SITE PLAN

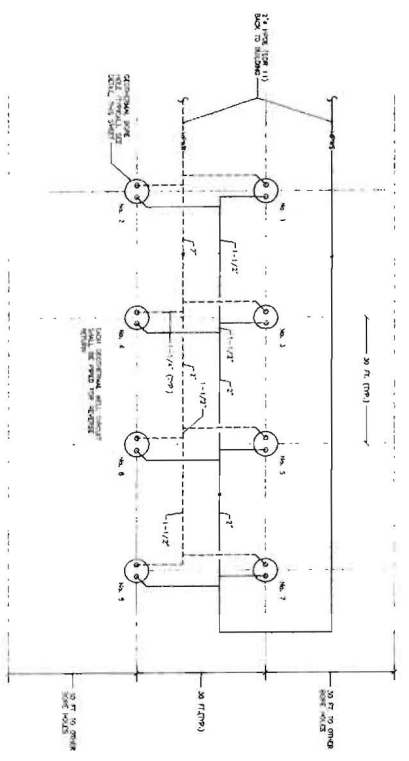
- NOTES
1. SEE GENERAL NOTES ON DRAWING SHEET 100 FOR GENERAL NOTES AND REQUIREMENTS.
 2. MECHANICAL ROOMS SHALL BE LOCATED AS SHOWN ON THIS PLAN.
 3. MECHANICAL ROOMS SHALL BE LOCATED AS SHOWN ON THIS PLAN.
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 10. MECHANICAL ROOMS SHALL BE LOCATED AS SHOWN ON THIS PLAN.



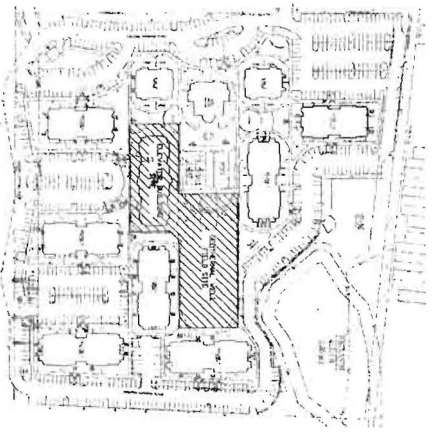
NOTES

1. BOREHOLE SHALL BE DRILLED TO A DEPTH OF 150 FT.
2. BOREHOLE SHALL BE DRILLED TO A DEPTH OF 150 FT.
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GEOTHERMAL HEAT PUMP WATER BORE HOLE DETAIL



TYPICAL GEOTHERMAL EARTH PIPING CIRCUIT DETAIL



SITE KEY PLAN

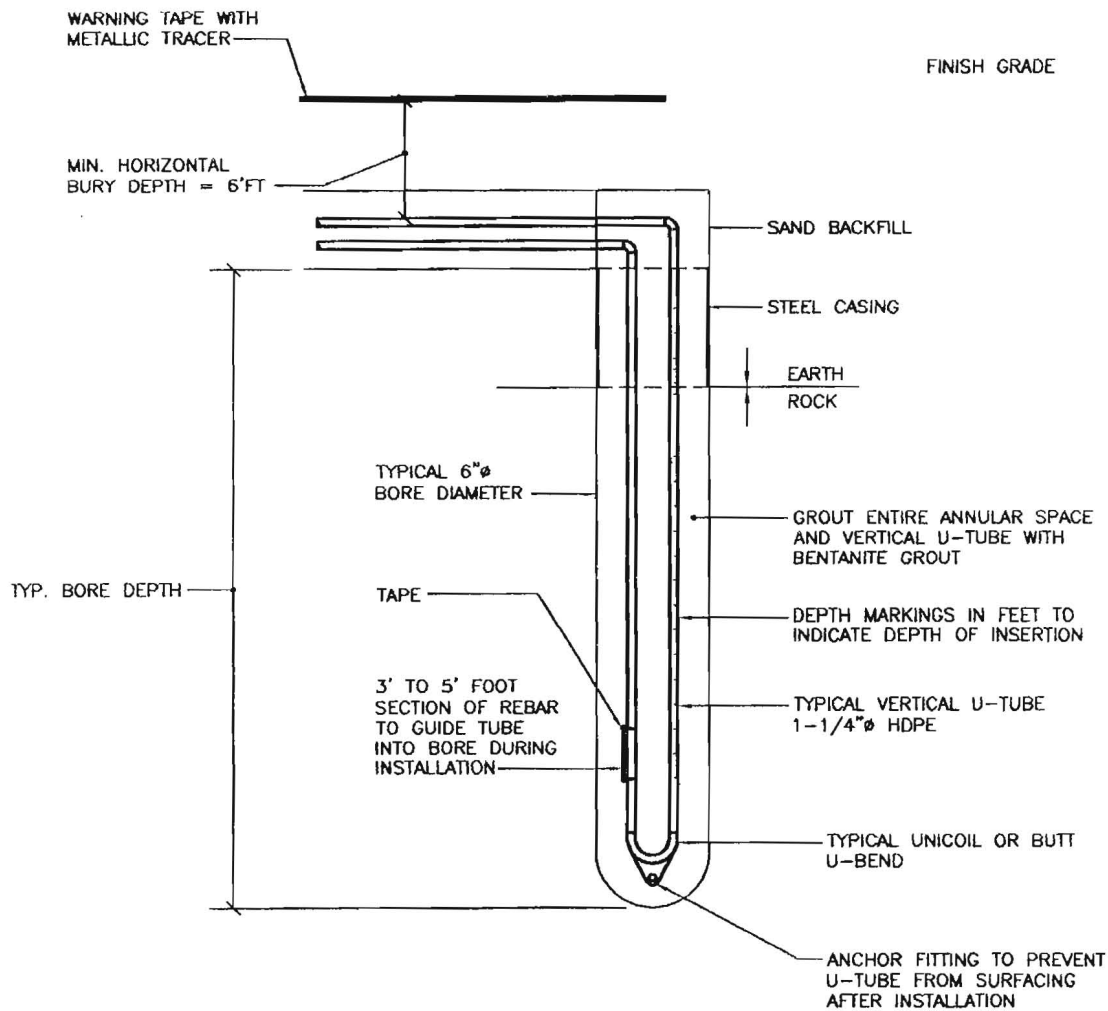
MECHANICAL SITE PLAN
 GUILFORD GARDENS - ELEVATOR BUILDING
 COLUMBIA, MD

091 20807

11720 Beltsville
 Drive
 Suite 600
 Colverton, MD 20705
 Tel 301.595.1000
 Fax 301.595.0089

1355 Beverly Road
 Suite 102
 McLean, VA 22101
 Tel 703.903.9100
 Fax 703.903.9736

M-10

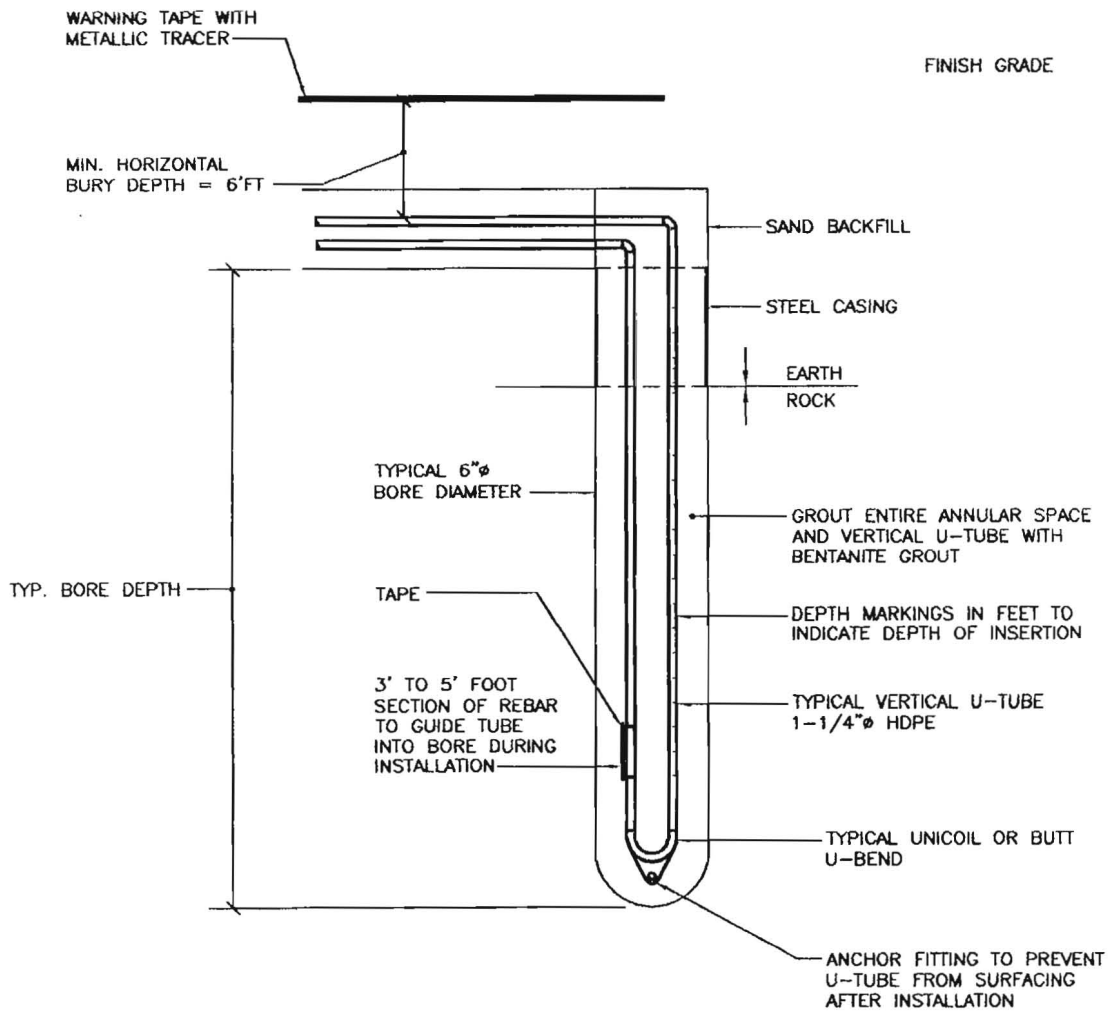


NOTES:

1. MINIMUM DISTANCE FROM LOT LINES, UTILITIES AND FOUNDATIONS = 10 FT.
2. MINIMUM DISTANCE FROM NON-PUBLIC WELL = 20 FT
3. MINIMUM DISTANCE FROM SEPTIC TANKS = 50 FT
4. MINIMUM DISTANCE FROM PUBLIC WELLS, SESS POOLS AND SEWAGE FIELDS = 100 FT
5. PROVIDE 80 FT OF STEEL CASING EACH BORE HOLE (ABANDON IN PLACE)
6. ON-SITE TEST WELL DATA:
 DATE/DURATION: 5/13,14,15/2009; 42-HOURS
 BORE HOLE DIA.: 5-1/2-IN.
 BORE HOLE DEPTH: 350-FT.
 PIPE LOOP DIA.: 1-1/4" HDPE
 GROUT: HIGH SOLIDS BENTONITE
 STATIC WATER LEVEL: 80-FT. DEPTH
 AVG. DEEP EARTH TEMP.: 56.40-DEG F.
 THERMAL CONDUCTIVITY: 1.6 BTU/HR-FT-F
7. MIN. GROUT CONDUCTIVITY = 1.0 BTU/HR-FT-F

GEOHERMAL HEAT PUMP
WATER BORE HOLE DETAIL

NOT TO SCALE



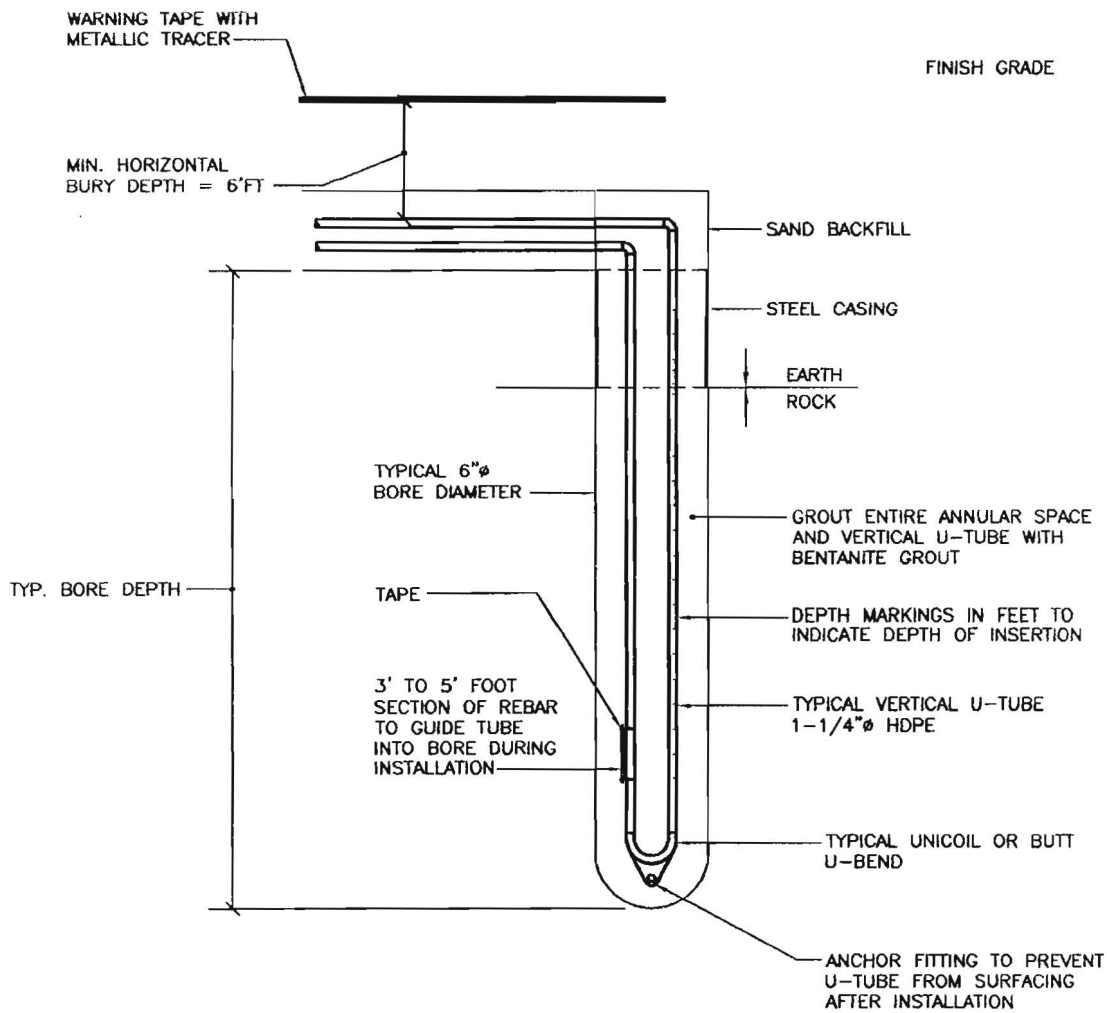
NOTES:

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2. MINIMUM DISTANCE FROM NON-PUBLIC WELL = 20 FT
3. MINIMUM DISTANCE FROM SEPTIC TANKS = 50 FT
4. MINIMUM DISTANCE FROM PUBLIC WELLS, SESS POOLS AND SEWAGE FIELDS = 100 FT
5. PROVIDE 80 FT OF STEEL CASING EACH BORE HOLE (ABANDON IN PLACE)
6. ON-SITE TEST WELL DATA:
 DATE/DURATION: 5/13,14,15/2009; 42-HOURS
 BORE HOLE DIA.: 5-1/2-IN.
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 GROUT: HIGH SOLIDS BENTONITE
 STATIC WATER LEVEL: 80-FT. DEPTH
 AVG. DEEP EARTH TEMP.: 56.40-DEG F.
 THERMAL CONDUCTIVITY: 1.6 BTU/HR-FT- $^{\circ}$ F
7. MIN. GROUT CONDUCTMITY = 1.0 BTU/HR-FT- $^{\circ}$ F

GEOHERMAL HEAT PUMP WATER BORE HOLE DETAIL

NOT TO SCALE

05/22/11/11/11/11



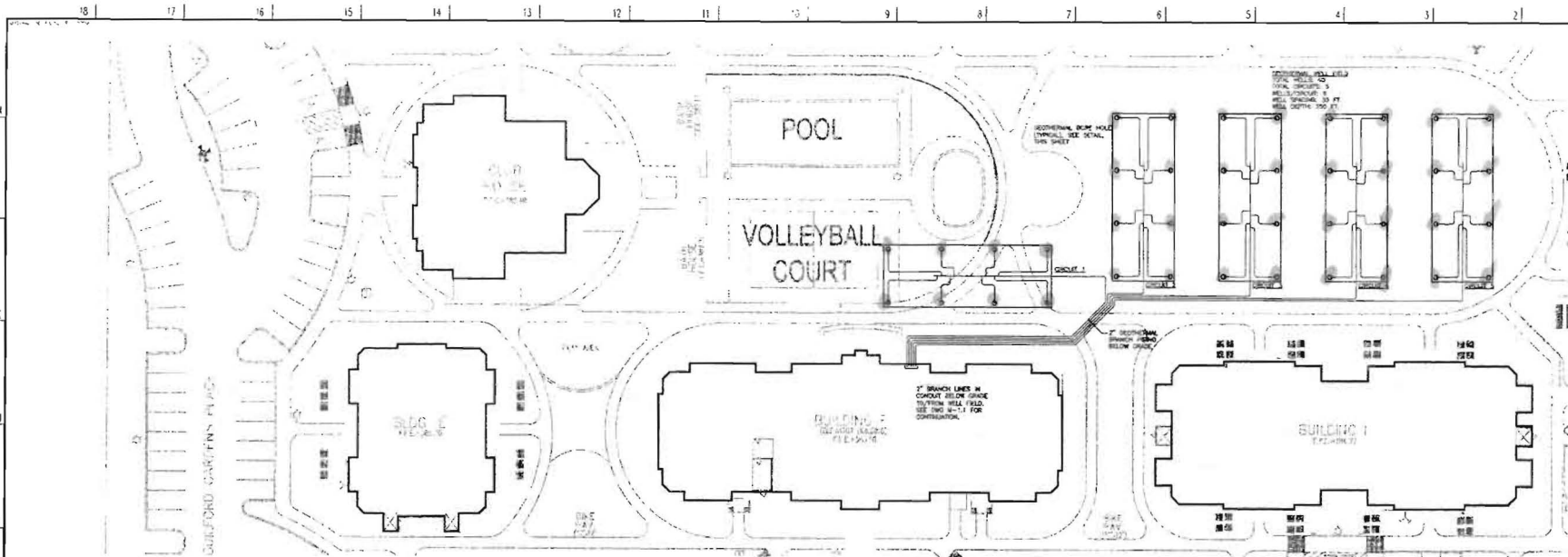
NOTES:

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2. MINIMUM DISTANCE FROM NON-PUBLIC WELL = 20 FT
3. MINIMUM DISTANCE FROM SEPTIC TANKS = 50 FT
4. MINIMUM DISTANCE FROM PUBLIC WELLS, SESS POOLS AND SEWAGE FIELDS = 100 FT
5. PROVIDE 80 FT OF STEEL CASING EACH BORE HOLE (ABANDON IN PLACE)
6. ON-SITE TEST WELL DATA:
 DATE/DURATION: 5/13,14,15/2009; 42-HOURS
 BORE HOLE DIA.: 5-1/2-IN.
 BORE HOLE DEPTH: 350-FT.
 PIPE LOOP DIA.: 1-1/4" HDPE
 GROUT: HIGH SOLIDS BENTONITE
 STATIC WATER LEVEL: 80-FT. DEPTH
 AVG. DEEP EARTH TEMP.: 56.40-DEG F.
 THERMAL CONDUCTIVITY: 1.6 BTU/HR-FT-'F
7. MIN. GROUT CONDUCTIVITY = 1.0 BTU/HR-FT-'F

GEOHERMAL HEAT PUMP
WATER BORE HOLE DETAIL

NOT TO SCALE

4/1/10

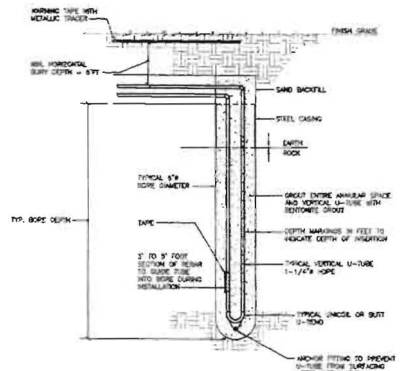


MECHANICAL SITE PLAN

SCALE: 1" = 20'-0"

NOTES:

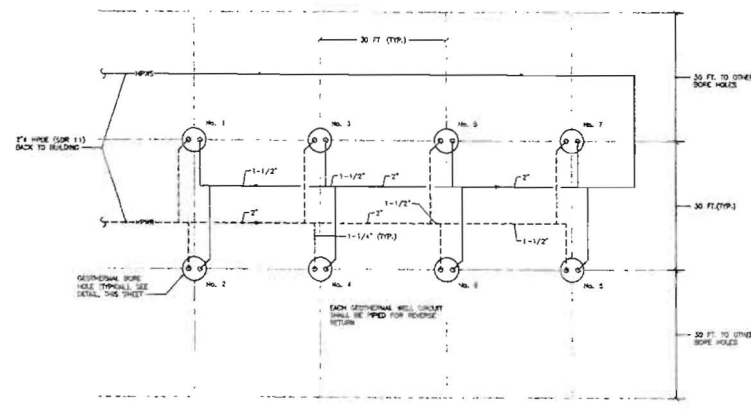
1. THE GROUND HEAT EXCHANGER CONTRACTOR SHALL EXTEND THE SUPPLY AND RETURN BRANCHES FROM EACH CIRCLE 25.0 FEET FROM THE EXTERIOR WALL OF THE MECHANICAL ROOM INSIDE THE BUILDING FOOTPRINT. THE MECHANICAL CONTRACTOR SHALL EXTEND EXTERIOR PIPING BEYOND THIS POINT AND THROUGHOUT THE EXISTING BUILDING SYSTEM.
2. THE GROUND HEAT EXCHANGER CONTRACTOR SHALL PROVIDE A POLYETHYLENE (PE) PIPE TO TRANSFER MECHANICAL CONNECTOR WITH CAP AND PLUG. THE MECHANICAL CONTRACTOR SHALL CONNECT THE BUILDING SYSTEM TO THE GROUND HEAT EXCHANGER AT THIS POINT.



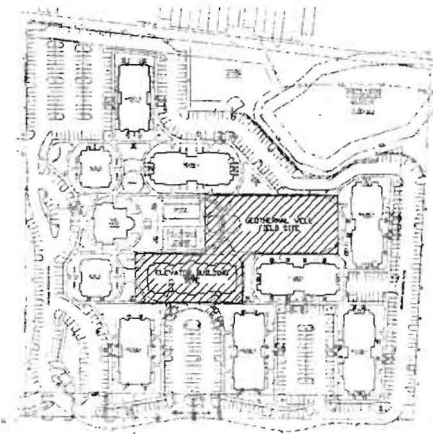
NOTES:

1. MINIMUM DISTANCE FROM LOT LINES, UTILITIES AND FOUNDATIONS = 10 FT
2. MINIMUM DISTANCE FROM NON-PURIFIED WELL = 20 FT
3. MINIMUM DISTANCE FROM SEPTIC TANKS = 50 FT
4. MINIMUM DISTANCE FROM PUBLIC WELLS, SEIS POOLS AND SERVICE PIPES = 100 FT
5. PROVIDE 60 FT OF STEEL CASING EACH BORE HOLE (ADDITION IN PLACE)
6. SH-PIPE TEST WELL:
 - DATE/COMPLETION: 5/11/14 15:20:00 43-INCHES
 - BORE HOLE DIA: 4-1/2-INCH
 - BORE HOLE DEPTH: 350-FT
 - PIPE DIA: 4-1/2-INCH
 - BORE HOLE SPACING: 30-FT ON CENTER, RECTANGULAR CONFIGURATION
 - FORMATION PERMEAL COEFFICIENT: 1.8 BRU/FT-DAY
 - VOLUMETRIC HEAT CAPACITY OF STRAND: 16.83 BRU/FT-DAY-FT
 - VOLUMETRIC HEAT CAPACITY OF FLUID: 43.5 BRU/FT-DAY-FT
 - ADJUSTED GROUND TEMPERATURE: 56.4 F
 - BORE HOLE TYPICAL HEADWATER: 0.141 F/BRU/FT-DAY
7. MIN. UNSAT. CONDUCTIVITY = 1.0 BRU/FT-DAY-FT
8. BASE OF DESIGN:
 - BORE HOLE SPACING: 30-FT ON CENTER, RECTANGULAR CONFIGURATION
 - FORMATION PERMEAL COEFFICIENT: 1.8 BRU/FT-DAY
 - VOLUMETRIC HEAT CAPACITY OF STRAND: 16.83 BRU/FT-DAY-FT
 - VOLUMETRIC HEAT CAPACITY OF FLUID: 43.5 BRU/FT-DAY-FT
 - ADJUSTED GROUND TEMPERATURE: 56.4 F
 - BORE HOLE TYPICAL HEADWATER: 0.141 F/BRU/FT-DAY

GEOHERMAL HEAT PUMP WATER BORE HOLE DETAIL
NOT TO SCALE



TYPICAL GEOHERMAL EARTH PIPING CIRCUIT DETAIL
NOT TO SCALE



SITE KEY PLAN
SCALE: 1" = 20'-0"

Received
10/13/2010

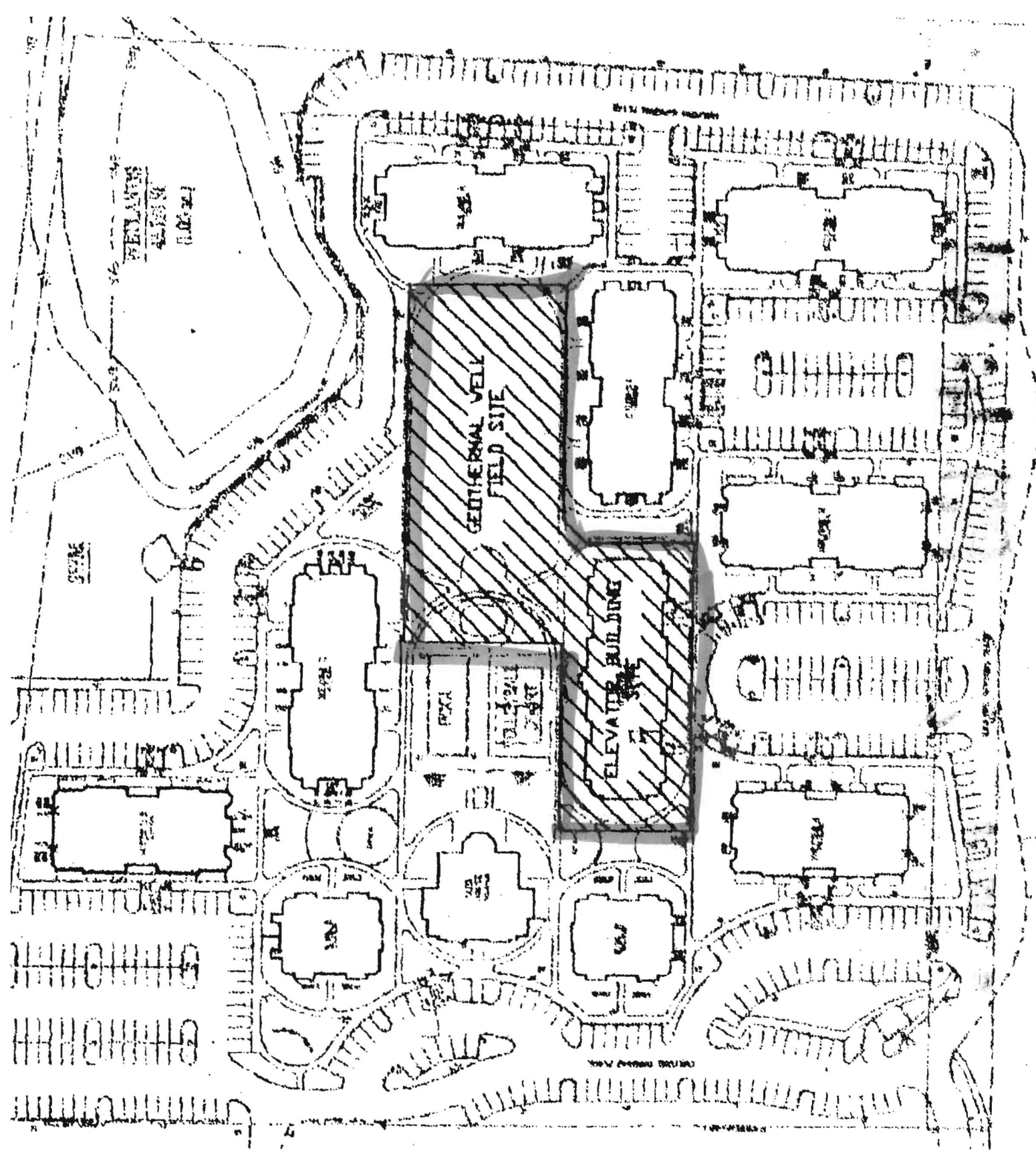
11720 Backville
Suite 100
Columbia, MD 21040
Tel: 301.595.1000
Fax: 301.595.0088

GP 20807

MECHANICAL SITE PLAN
GUILFORD GARDENS - ELEVATOR BUILDING
COLUMBIA, MD

DATE	DESCRIPTION
1/10/08	PLANS SET
5/10/08	REVISION #1
1/10/09	ON UNIVERSITY
1/10/09	ISSUE RECORD
1/10/09	REVISION #2
1/10/09	REVISION #3

M-10



- 30 FT. (TYP.)

- 30 FT. TO OTHER BORE HOLES