GEOTHERMAL PROJECT

DUBLIN COMMUNITY RECREATION CENTER
5600 POST ROAD
DUBLIN, OHIO 43017
November 24, 2014

PREPARED FOR:

BRIAN K. ASHFORD
FACILITIES MANAGER
CITY OF DUBLIN
6555 SHIER RINGS RD
DUBLIN, OH 43016

PREPARED BY:

PRATER ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS
6130 WILCOX ROAD
DUBLIN, OHIO 43016
(614) 766-4896 FAX (614) 766-2354

CODE INFORMATION

BUILDING CODES:
OHIO BASIC BUILDING CODES, 2011 EDITION
AMERICANS WITH DISABILITIES ACT
ACCESSIBILITY GUIDELINES

BUILDING DATA:
TABLE 501
CONSTRUCTION TYPE: IIB (EXISTING BUILDING)
USE GROUP: ASSEMBLY
ACCESSIBILITY GUIDELINES

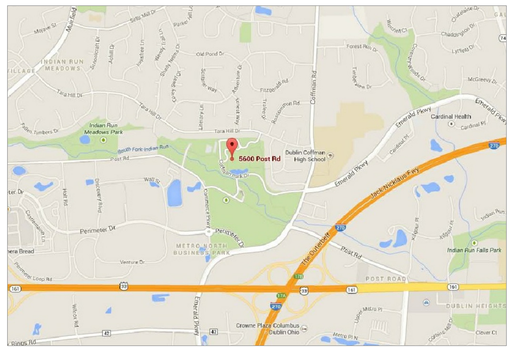
THIS PROJECT CONSISTS OF THE REMOVAL OF TWO COOLING TOWERS AND THE INSTALLATION OF TWO GEOTHERMAL WELLS TO REPLACE THE COOLING TOWERS. THE BUILDING SQUARE FOOTAGE DOES NOT CHANGE. THE BUILDING OCCUPANCY DOES NOT CHANGE.

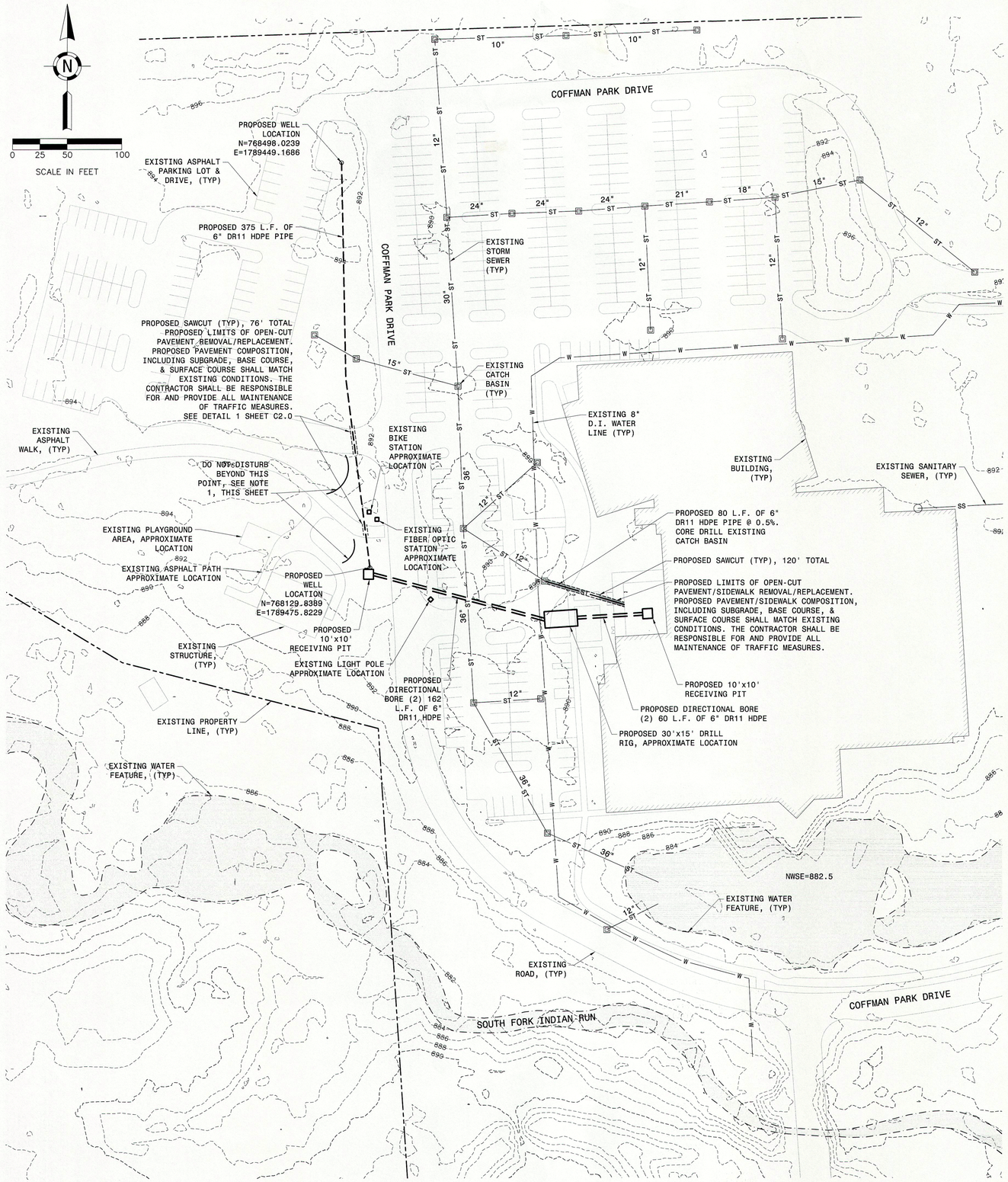
VICINITY MAP

DRAWING INDEX

G0 – COVER SHEET
C1.0 – CIVIL SITE PLAN AND PROFILES
C2.0 – EXISTING DETAILED PLAN
C3.0 – MISCELLANEOUS NOTES
HD11 – PARTIAL FIRST FLOOR HVAC COURTYARD DEMOLITION PLAN
HD12 – PARTIAL FIRST FLOOR HVAC DEMOLITION PLAN
H01 – HVAC SITE PLAN
H11 – PARTIAL FIRST FLOOR HVAC COURTYARD PLAN
H12 – PARTIAL FIRST FLOOR HVAC PLAN
H21 – HVAC PIPING SCHEMATICS
H22 – HVAC SCHEDULES AND GENERAL NOTES
ED11 – PARTIAL COURTYARD ELECTRICAL DEMOLITION PLAN
ED12 – PARTIAL FIRST FLOOR ELECTRICAL DEMOLITION PLAN
E01 – SITE ELECTRICAL PLAN
E11 – PARTIAL COURTYARD ELECTRICAL PLAN
E12 – PARTIAL FIRST FLOOR ELECTRICAL PLAN
E22 – ELECTRICAL RISERS SCHEDULES AND GENERAL NOTES

VICINITY MAP





EXISTING LEGEND

- EXISTING PROPERTY LINE, APPROXIMATE LOCATION
- EXISTING EDGE OF ROAD, APPROXIMATE LOCATION
- 890 EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING WATER FEATURE, APPROXIMATE LOCATION
- EXISTING BUILDING
- ST EXISTING STORM SEWER
- W EXISTING WATER LINE
- SS EXISTING SANITARY SEWER
- EXISTING CATCH BASIN
- EXISTING MANHOLE

PROPOSED LEGEND

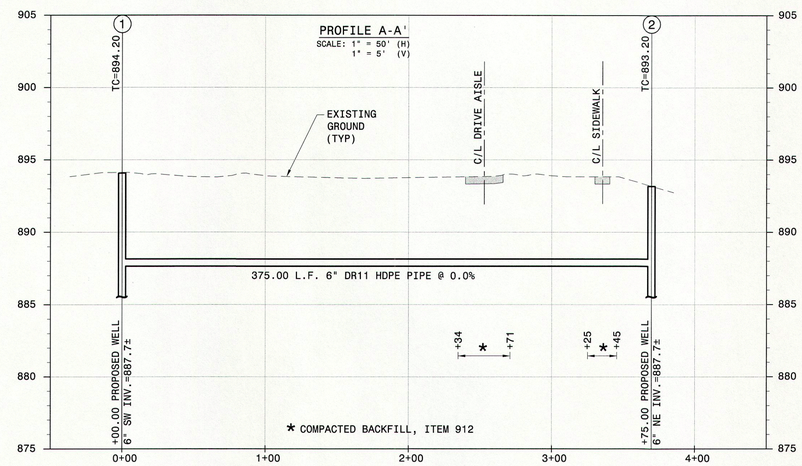
- PROPOSED 6" DR11 HDPE, DIRECTIONAL BORE
- PROPOSED 6" DR11 HDPE PIPE, TRENCHED
- PROPOSED WELL, APPROXIMATE LOCATION

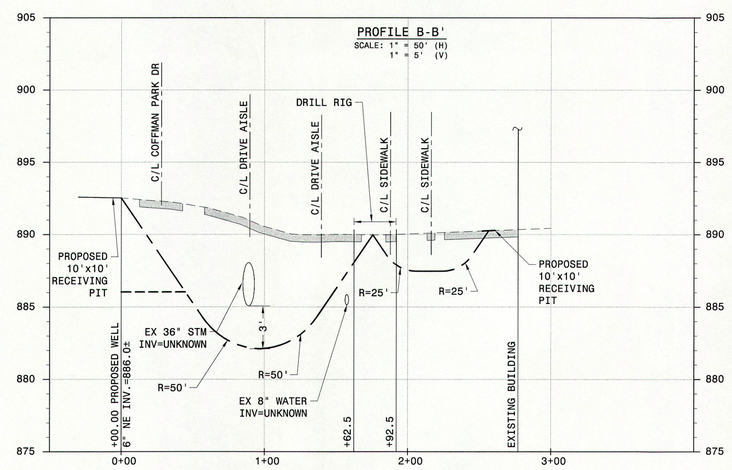
SURVEY

1. EXISTING BOUNDARY, STREAM, UTILITY AND WATER FEATURE INFORMATION OBTAINED FROM COUNTY GIS DATA.
2. EXISTING TOPOGRAPHY INFORMATION IS BASED ON OSIP BARE-EARTH DIGITAL ELEVATION MODEL (DEM) DERIVED FORM DIGITAL LIDAR DATA.
3. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE SURVEY OR THE ACCURACY OF THE EXISTING INFORMATION AND THE PROPERTY LINE SHOWN.

UTILITIES:

1. THE CONTRACTOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. THE COST OF THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS RELATED ITEMS. THE CONTRACTOR SHALL EXPOSE ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECTS ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL CALL, TOLL FREE, THE OHIO UTILITIES PROTECTION SERVICE (1-800-362-2764) AND THE OHIO OIL & GAS PROCEDURES UNDERGROUND PROTECTION SERVICE (1-740-587-0486) 72 HOURS PRIOR TO CONSTRUCTION AND SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO WORK IN THE VICINITY OF THEIR UNDERGROUND LINES.





NOTE

1. CONTRACTOR SHALL INSTALL TREE PROTECTION FENCE AROUND ALL TREES PER DUBLIN CITY CODE. IF TREES WILL BE REMOVED OR DAMAGED, CONTRACTOR SHALL FIELD LOCATE TREES AND PROVIDE SPECIES, SIZE, AND REPLACEMENT DETAILS PRIOR TO AFFECTING TREE. TREES 6" IN DIAMETER OR GREATER SHALL BE REPLACED INCH FOR INCH. CONTRACTOR SHALL INCLUDE IN BID ALL COSTS ASSOCIATED WITH THIS NOTE.

HULL
BROWNFIELDS
SHALE OIL & GAS
WASTE MANAGEMENT
ENVIRONMENTAL
ALTERNATIVE ENERGY
6397 Emerald Parkway
Suite 200
Dublin, Ohio 43016
Phone: (614) 793-8777
Fax: (614) 793-9070
www.hullinc.com

Ohio Utilities Protection Service
Call 811 before you dig
800-362-2764

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
SITE PLAN AND PROFILES
CADD#:

project number
13390

drawn	JTH
design	JFB
checked	JFB

issued for	date
BID	11/24/14

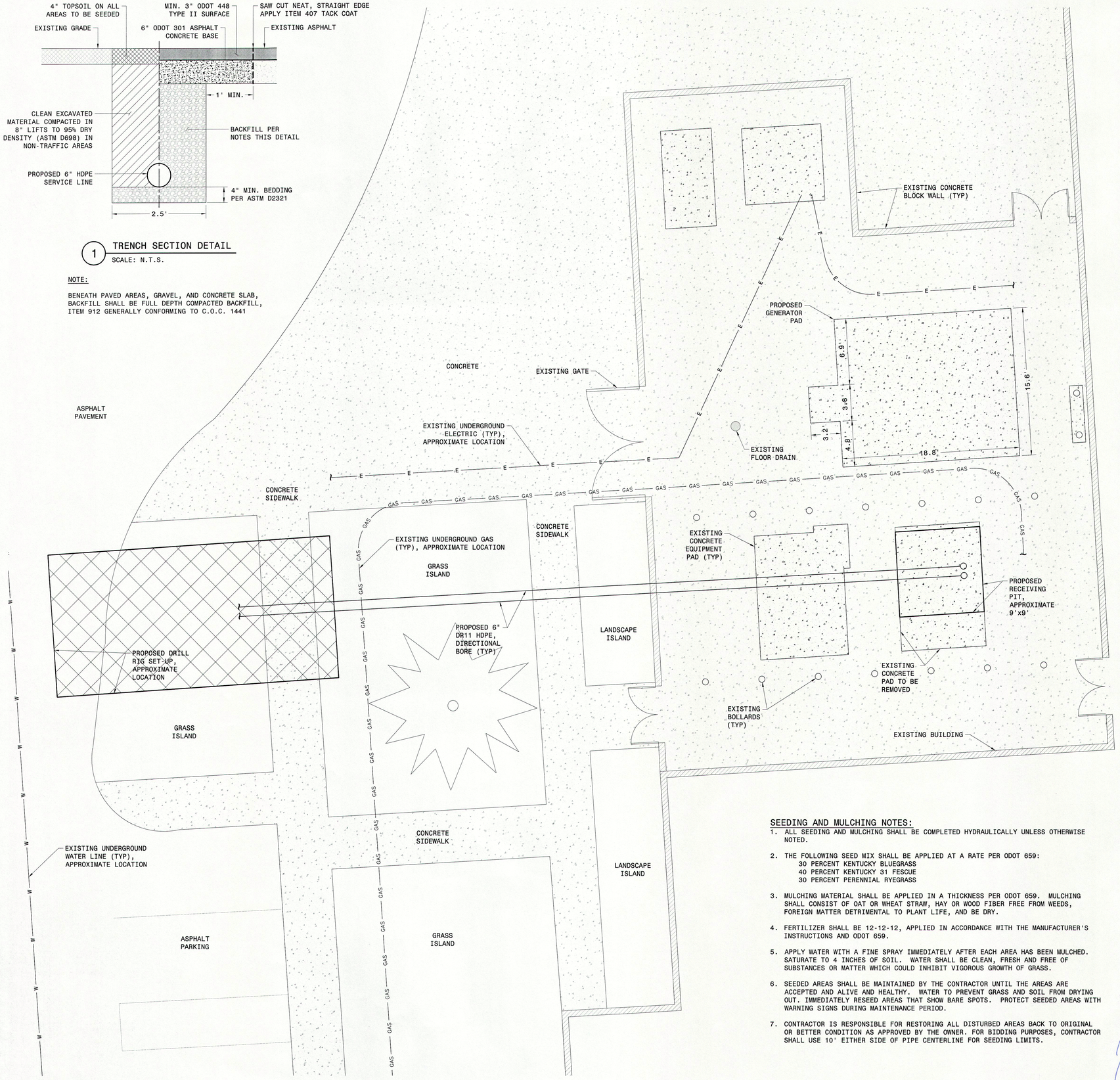
sheet
C1.0

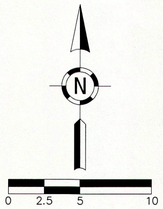
1 TRENCH SECTION DETAIL

SCALE: N.T.S.

NOTE:

BENEATH PAVED AREAS, GRAVEL, AND CONCRETE SLAB, BACKFILL SHALL BE FULL DEPTH COMPACTED BACKFILL, ITEM 912 GENERALLY CONFORMING TO C.O.C. 1441





SCALE IN FEET

LEGEND

- EXISTING BUILDING, CONCRETE BLOCK
- EXISTING CONCRETE
- EXISTING CONCRETE (EQUIPMENT PAD)
- E — EXISTING UNDERGROUND ELECTRIC, APPROXIMATE LOCATION
- GAS — EXISTING UNDERGROUND GAS, APPROXIMATE LOCATION
- EXISTING BOLLARD
- EXISTING FLOOR DRAIN
- PROPOSED 6" DR11 HDPE PIPE, DIRECTIONAL BORE

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY REQUIREMENTS INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. THE CONTRACTOR SHALL EXERCISE PRECAUTION ALWAYS FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT SHALL ALSO BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, INCLUDING THE REQUIREMENTS FOR CONFINED SPACES PER 29 CFR 1910.146, AND EXCAVATION REQUIREMENTS PER CFR 1926.650 SUBPART P.
2. ALL ITEMS OF WORK CALLED FOR ON THE PLANS FOR WHICH NO SPECIFIC METHOD OF PAYMENT IS PROVIDED SHALL BE PERFORMED BY THE CONTRACTOR AND THE COST OF SAME SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS RELATED ITEMS.
3. THE PRICE(S) QUOTED SHALL INCLUDE ALL ITEMS OF LABOR, MATERIALS, TOOLS, EQUIPMENT, INSURANCE AND OTHER COSTS NECESSARY TO FULLY COMPLETE THE WORK PURSUANT TO THE CONTRACT DOCUMENTS. IT IS THE INTENTION OF THE CONTRACT DOCUMENTS TO PROVIDE AND REQUIRE A COMPLETED WORK PROJECT READY FOR OPERATION. ANY WORK ITEMS OMITTED FROM SUCH CONTRACT DOCUMENTS WHICH ARE CLEARLY NECESSARY FOR THE COMPLETION OF SUCH WORK AND ITS APPURTENANCES SHALL BE CONSIDERED A PART OF SUCH WORK ALTHOUGH NOT DIRECTLY SPECIFIED OR CALLED FOR IN THE CONTRACT DOCUMENTS.
4. INVESTIGATIONS, LOCATION, SUPPORT, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. WHERE POTENTIAL GRADE CONFLICTS MIGHT OCCUR WITH EXISTING UTILITIES, THE CONTRACTOR SHALL UNCOVER THE EXISTING UTILITY IN ADVANCE OF LAYING PIPE IN ORDER THAT THE ENGINEER MAY DETERMINE THE EXACT ELEVATION AND MAKE ANY NECESSARY ADJUSTMENTS.
6. THE CONTRACTOR SHALL GIVE PROPER NOTICE TO THE OHIO UTILITIES PROTECTION SERVICE (PHONE 1-800-362-2764), OHIO OIL & GAS PROCEDURES UNDERGROUND PROTECTION SERVICE (1-740-587-0486) AND TO THE OWNERS OF THE UTILITY FACILITIES SHOWN ON THE PLAN WHO ARE NOT MEMBERS OF A REGISTERED UTILITY PROTECTION SERVICE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE RELOCATION OF ANY UTILITY AS REQUIRED BY THE PLAN WITH THE OWNER OF THE AFFECTED UTILITY.
7. ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED, AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE OHIO MANUAL OF TRAFFIC DEVICES FOR CONSTRUCTION AND MAINTENANCE OPERATIONS, PUBLISHED BY ODOT, BUREAU OF TRAFFIC.
8. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY OR ALL EXISTING SIGNS, SHRUBS, FENCES, OR OTHER PHYSICAL FEATURES DAMAGED DURING THE EXECUTION OF THIS CONTRACT AT HIS OWN EXPENSE. ALL REPAIRS SHALL BE TO THE SATISFACTION OF THE OWNER.
9. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND GOVERNMENT FEES, LICENSES, AND INSPECTIONS NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF IMPROVEMENTS SHOWN ON THESE PLANS, EXCLUDING THE OHIO EPA PERMIT-TO-INSTALL.
10. THE CONTRACTOR SHALL PROVIDE AS-BUILT ENGINEERING PLANS AT THE COMPLETION OF CONTRACT. PLANS SHALL BE SUBMITTED IN HARD COPY AND IN ELECTRONIC FORMAT (CAD FILE).
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONDITION OF ALL TRENCHES WITHIN THE WORK LIMITS FOR A PERIOD OF (1) YEAR FROM THE FINAL ACCEPTANCE OF THE WORK, AND SHALL MAKE ANY NECESSARY REPAIRS AT NO COST TO THE OWNER.
12. THE CONTRACTOR SHALL CONFINE ACTIVITIES TO THE PROJECT SITE, EXISTING RIGHTS-OF-WAY, TEMPORARY EASEMENTS AND PERMANENT EASEMENTS, AND SHALL NOT ENTER UPON OTHER PROPERTIES WITHOUT WRITTEN PERMISSION OF THE OWNER.
13. SHOULD WATER BE ENCOUNTERED, THE CONTRACTOR SHALL FURNISH AND OPERATE SUITABLE PUMPING EQUIPMENT OF SUCH CAPACITY ADEQUATE TO DEWATER THE TRENCH. THE TRENCH SHALL BE SUFFICIENTLY DEWATERED SO THAT THE PLACEMENT OF BEDDING AND LAYING AND JOINING OF THE PIPE IS MADE IN A TRENCH FREE OF STANDING WATER. THE CONTRACTOR SHALL CONVEY ALL TRENCH WATER TO A NATURAL DRAINAGE CHANNEL OR STORM SEWER WITHOUT CAUSING ANY PROPERTY DAMAGE.
14. THE CONTRACTOR SHALL REFERENCE ALL IRON PINS AND MONUMENTS BEFORE EXCAVATING AT OR NEAR SAID IRON PINS OR MONUMENTS. IF ANY PINS OR MONUMENTS ARE DESTROYED OR DAMAGED BY THE CONTRACTOR, THEY SHALL BE ACCURATELY REPLACED BY A REGISTERED SURVEYOR IN THE STATE OF OHIO AT THE COMPLETION OF THE PROJECT.
15. THE COST OF RELOCATING AND/OR SECURING ANY POWER POLES AS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS ITEMS OF THE CONTRACT.
16. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ADEQUATE DRAINAGE AND PROPER SOIL EROSION CONTROL MEASURES FOR PROTECTION OF ALL ADJACENT ROADS AND LANDS, PER ODOT ITEM 207.
17. THE TRACKING OR SPILLAGE OF MUD, DIRT, OR DEBRIS UPON STATE, COUNTY, TOWNSHIP, OR CITY STREETS IS PROHIBITED AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR.
18. CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR SCHEDULING AND STORAGE OF OWNER FURNISHED EQUIPMENT.

SEEDING AND MULCHING NOTES:

1. ALL SEEDING AND MULCHING SHALL BE COMPLETED HYDRAULICALLY UNLESS OTHERWISE NOTED.
2. THE FOLLOWING SEED MIX SHALL BE APPLIED AT A RATE PER ODOT 659:
   30 PERCENT KENTUCKY BLUEGRASS
   40 PERCENT KENTUCKY 31 FESCUE
   30 PERCENT PERENNIAL RYEGRASS
3. MULCHING MATERIAL SHALL BE APPLIED IN A THICKNESS PER ODOT 659. MULCHING SHALL CONSIST OF OAT OR WHEAT STRAW, HAY OR WOOD FIBER FREE FROM WEEDS, FOREIGN MATTER DETRIMENTAL TO PLANT LIFE, AND BE DRY.
4. FERTILIZER SHALL BE 12-12-12, APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND ODOT 659.
5. APPLY WATER WITH A FINE SPRAY IMMEDIATELY AFTER EACH AREA HAS BEEN MULCHED. SATURATE TO 4 INCHES OF SOIL. WATER SHALL BE CLEAN, FRESH AND FREE OF SUBSTANCES OR MATTER WHICH COULD INHIBIT VIGOROUS GROWTH OF GRASS.
6. SEEDED AREAS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL THE AREAS ARE ACCEPTED AND ALIVE AND HEALTHY. WATER TO PREVENT GRASS AND SOIL FROM DRYING OUT. IMMEDIATELY RESEED AREAS THAT SHOW BARE SPOTS. PROTECT SEEDED AREAS WITH WARNING SIGNS DURING MAINTENANCE PERIOD.
7. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DISTURBED AREAS BACK TO ORIGINAL OR BETTER CONDITION AS APPROVED BY THE OWNER. FOR BIDDING PURPOSES, CONTRACTOR SHALL USE 10' EITHER SIDE OF PIPE CENTERLINE FOR SEEDING LIMITS.

HULL
BROWNFIELDS
SHALE OIL & GAS
WASTE MANAGEMENT
ENVIRONMENTAL
ALTERNATIVE ENERGY
6397 Emerald Parkway
Suite 200
Dublin, Ohio 43016
Phone: (614) 793-8777
Fax: (614) 793-9070
www.hullinc.com

Ohio Utilities Protection Service
Call 811 before you dig
800-362-2764

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
EXISTING DETAILED PLAN
CADD#:

project number
13390

drawn	JTH
design	JFB
checked	JFB

issued for	date
BID	11/24/14

sheet
C2.0

ON-GRADE DIRECTIONAL DRILLING

DESCRIPTION OF WORK

1) THIS SPECIFICATION COVERS THE REQUIREMENTS FOR FURNISHING ALL LABOR, EQUIPMENT AND MATERIALS ASSOCIATED WITH THE INSTALLATION OF A HIGH-DENSITY POLYETHYLENE (HDPE) PIPE BY DIRECTIONAL DRILLING METHOD. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, STEERABLE DIRECTIONAL BORING EQUIPMENT, BORING PITS AND EQUIPMENT, SHEETING, MISCELLANEOUS APPURTENANCES TO COMPLETE THE WORK AS SHOWN ON THE CONTRACT DRAWINGS, AND RESTORATION. DIRECTIONAL DRILLING OPERATIONS SHALL BE PERFORMED WITHIN THE RIGHT OF WAY AND/OR EASEMENTS SHOWN ON THE DRAWINGS. WHEN COMPLETE, THE HDPE PIPING SHALL BE A CONTINUOUS, FUSED LENGTH OF PIPE FROM ENTRY TO EXIT PIT.

2) THE WORK SPECIFIED HEREIN SHALL INCLUDE EXCAVATION OF DRILLING AND RECEIVING PITS, DRILLING OF A PILOT HOLE AT PRESCRIBED LINE AND GRADE, REAMING OF THE HOLE (AS NEEDED), PULLBACK OF THE HDPE PIPE THROUGH THE HOLE, GROUTING OF ANY ANNULAR VOIDS BETWEEN THE PIPE AND BORE/EXCAVATION (AS NEEDED), PRESSURE TESTING OF THE HDPE PIPE, AND ALL INCIDENTAL WORK SUCH AS HORIZONTAL AND VERTICAL CONTROL POINTS, GRIDS, PERMITS, SLURRY TREATMENT AND DISPOSAL, SHORING AND CASING OF THE PITS IF REQUIRED, AND ALL ELSE NECESSARY FOR THE COMPLETE INSTALLATION OF THE PIPE IN ACCORDANCE WITH THESE SPECIFICATIONS AND CONTRACT DRAWINGS.

3) DRILLING OPERATIONS MUST NOT INTERFERE WITH OR ENDANGER SURFACE AND ACTIVITY UPON THE SURFACE. AREAS OUTSIDE DESIGNATED WORK AREAS SHOULD NOT BE DISTURBED.

4) CONTRACTOR SHALL CONDUCT OPERATIONS AND SCHEDULE CLEANUP IN A MANNER TO CAUSE THE LEAST POSSIBLE OBSTRUCTION AND INCONVENIENCE TO TRAFFIC, PEDESTRIANS AND TO ADJACENT PROPERTY OWNERS.

5) THE CONTRACTOR SHALL CARRY OUT THE OPERATIONS IN STRICT ACCORDANCE WITH ALL APPLICABLE OSHA REGULATIONS. PARTICULAR ATTENTION IS CALLED TO THOSE SAFETY REQUIREMENTS INVOLVING WORK ON AN ELEVATED PLATFORM AND ENTRY INTO A CONFINED SPACE.

6) THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT THE PIPE WHILE BEING HANDLED. CHAIN, END HOOKS, OR CABLES SLINGS SHALL NOT BE USED TO HANDLE PIPE. PIPE SHALL BE STORED ON CLEAN, LEVEL GROUND TO PREVENT UNDUE SCRATCHING OR GOUGING OF THE PIPE.

7) CARE SHALL BE TAKEN TO PROTECT THE PIPE FROM SCARRING, GOUGING, OR EXCESSIVE ABRASION. PIPE WITH GOUGES GREATER THAN 10% OF THE MINIMUM WALL THICKNESS WILL BE REJECTED.

8) IF PIPE IS STACKED, STACKING HEIGHT SHALL NOT EXCEED THE MANUFACTURER'S RECOMMENDATIONS.

9) THE CONTRACTOR SHALL GUARANTEE ALL WORK AS STATED IN THE CMSC SECTION 109.13.

10) CONTRACTOR SHALL HAVE ACTIVELY ENGAGED IN THE INSTALLATION OF PIPE USING ON-GRADE BORING FOR A MINIMUM OF THREE YEARS, WITH AT LEAST TEN PROJECTS IN SIMILAR GROUND WITH SIMILAR SIZE AND LENGTH. EVIDENCE OF QUALIFICATION SHALL BE SUBMITTED WITH BID.

11) FIELD SUPERVISORY PERSONNEL EMPLOYED BY THE DIRECTIONAL DRILLING CONTRACTOR SHALL HAVE AT LEAST THREE YEARS OF EXPERIENCE IN THE PERFORMANCE OF THE WORK. RESUMES SHALL BE SUBMITTED WITH BID.

12) THE CONTRACTOR SHALL SUBMIT DOCUMENTATION SHOWING THREE YEARS OF DIRECTIONAL DRILLING EXPERIENCE WITH PROJECTS SIMILAR IN SCOPE TO THIS PROJECT. INFORMATION MUST INCLUDE, BUT NOT BE LIMITED TO, DATE AND DURATION OF WORK, LOCATION, PIPE INFORMATION (I.E., LENGTH, DIAMETER, DEPTH OF INSTALLATION, PIPE MATERIAL, ETC.), PROJECT OWNER INFORMATION, (I.E., NAME, ADDRESS, TELEPHONE NUMBER, CONTACT PERSON), AND THE CONTENTS HANDLED BY THE PIPELINE (WATER, WASTEWATER, ETC.).

13) THE CONTRACTOR SHALL SUBMIT A LIST OF FIELD SUPERVISORY PERSONNEL AND THEIR EXPERIENCE WITH ON-GRADE HORIZONTAL DIRECTIONAL DRILLING (HDD). AT LEAST ONE OF THE FIELD SUPERVISORS LISTED MUST BE AT THE SITE AND BE RESPONSIBLE FOR ALL WORK AT ALL TIMES WHEN HDD OPERATIONS ARE IN PROGRESS. HDD OPERATIONS WILL NOT PROCEED UNTIL THE RESUME(S) OF THE CONTRACTOR'S FIELD SUPERVISORY PERSONNEL HAVE BEEN RECEIVED AND REVIEWED BY THE PROJECT ENGINEER.

14) POLYETHYLENE PIPE JOINTING SHALL BE PERFORMED BY PERSONNEL TRAINED IN THE USE OF JOINT FUSION AND STAB JOINT EQUIPMENT AND RECOMMENDED METHODS FOR PIPE LINER CONNECTION. PERSONNEL DIRECTLY INVOLVED WITH INSTALLING THE PIPE SHALL RECEIVE TRAINING IN THE PROPER METHODS FOR HANDLING, INSERTING, TRIMMING, AND FINISHING THE PIPE. THE CONTRACTOR SHALL PROVIDE A CERTIFICATION OF TRAINING AND EXPERIENCE FOR EACH FUSION AND INSTALLING CREW MEMBER.

15) THE CONTRACTOR SHALL PERFORM TRIAL FUSION WELDS AND SUBMIT SAMPLES TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION OF THE PIPE. FULL PENETRATION WELDS SHALL PROVIDE A HOMOGENEOUS MATERIAL ACROSS THE CROSS SECTION OF THE WELD. THE FUSION MACHINE EMPLOYED FOR THE TRIAL WELDS SHALL BE THE SAME MACHINE TO BE UTILIZED FOR THE INSTALLATION WORK.

16) THE CONTRACTOR SHALL SUBMIT THE FOLLOWING DRAWINGS AND DOCUMENTS:

A. WORKING DRAWINGS AND WRITTEN PROCEDURE DESCRIBING IN DETAIL THE PROPOSED METHOD OF INSTALLATION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, SIZE, CAPACITY AND SETUP REQUIREMENTS OF EQUIPMENT, LOCATION AND SITING OF DRILLING AND RECEIVING PITS, DEWATERING (IF APPLICABLE), METHOD OF FUSION AND TYPE OF EQUIPMENT FOR JOINING PIPE, TYPE OF CUTTING TOOL HEAD, AND THE METHOD OF MONITORING AND CONTROLLING LINE AND GRADE. SUBMIT THE REQUIRED CERTIFICATIONS. IF THE CONTRACTOR DETERMINES THAT THE MODIFICATIONS TO THE METHOD AND EQUIPMENT AS STATED IN THE SUBMITTAL IS NECESSARY DURING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A PLAN DESCRIBING SUCH MODIFICATIONS, INCLUDING THE REASONS FOR THE MODIFICATION. WORK SHALL NOT START UNTIL SUBMITTALS ARE REVIEWED BY THE ENGINEER.

b. BENTONITE DRILLING MUD PRODUCTS INFORMATION (MSDS); SPECIAL PRECAUTIONS NECESSARY, METHOD OF MIXING AND APPLICATION, AND METHOD OF REMOVING AND DISPOSAL OF THE SPOILS.

c. ENGINEERING CALCULATIONS FOR THE DESIGN OF THE HDPE PIPE THICKNESS. THE DESIGN CALCULATIONS SHALL BE CHECKED AND APPROVED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF OHIO. PIPE DESIGN CALCULATIONS SHALL BE SUPPORTED BY FIELD ANALYSIS AND TECHNICAL ASSUMPTIONS. THE CONTRACTOR SHALL SUBMIT CALCULATIONS TO SHOW THAT STRESSES ON PROPOSED PIPE DURING HDD (PULLBACK) OPERATIONS ARE BELOW THE RATED PIPE YIELD STRESS LIMIT. LOADS USED IN CALCULATION WILL INCLUDE SOIL DEAD LOAD (120 PCF SOIL DENSITY), APPLICABLE LIVE LOAD, PRESSURE FROM HIGH WATER LEVEL, AND THE MAXIMUM PUSHING AND/OR PULLING FORCE IMPOSED BY PIPE BURSTING EQUIPMENT. FINAL APPROVAL OF THE DESIGN CALCULATIONS SHALL BE GIVEN BY THE ENGINEER. THE CALCULATED WALL THICKNESS DERIVED USING THE ABOVE DESIGN CRITERIA SHALL BE COMPARED TO THE SPECIFIED (BID) PIPE THICKNESS (DR- 11). THE ENGINEER THEN HAS THE RIGHT TO EITHER KEEP THE SPECIFIED PIPE THICKNESS (DR-11) OR CHANGE TO THE CALCULATED PIPE THICKNESS FOR INSTALLATION.

d. MATERIAL SAFETY DATA SHEET (MSDS) FOR ANY LUBRICANT OR OTHER POTENTIALLY HAZARDOUS MATERIAL USED ON PROJECT.

e. FURNISH MANUFACTURER'S CERTIFICATE STATING GUIDANCE SYSTEM MEETS TOLERANCES SPECIFIED BELOW.

f. SUBMIT CALIBRATION RECORDS FOR GUIDANCE SYSTEM. SYSTEM SHALL HAVE BEEN CALIBRATED WITHIN THE LAST YEAR.

g. SUBMIT AN AS-BUILT SURVEY OF THE PILOT HOLE PRIOR TO PRE-REAMING AND/OR PIPE PULLBACK AND AN AS-BUILT SURVEY OF THE CARRIER PIPE UPON WORK COMPLETION, INDICATING CONFORMANCE WITH THE SPECIFIED REQUIREMENTS.

h. FACTORY PIPE TESTS RESULTS ON HDPE PIPE PER BATCH OF PIPE (APPROXIMATELY EVERY 100 PIPE) SHALL INCLUDE AVERAGE OUTSIDE DIAMETER (ASTM D 2122), AVERAGE INSIDE DIAMETER (ASTM D 2122), MINIMUM WALL THICKNESS (ASTM D 2122), PIPE STIFFNESS AT 5% (ASTM D 2412), TENSILE STRENGTH AT YIELD (ASTM D 638), TENSILE MODULUS (ASTM D 638), FLEXURAL STRENGTH (ASTM D 790), FLEXURAL MODULUS (ASTM D 790), IMPACT STRENGTH (ASTM D 256).

17) THE PIPE SUPPLIED UNDER THIS SPECIFICATION SHALL BE HIGH PERFORMANCE, HIGH MOLECULAR WEIGHT, HIGH DENSITY POLYETHYLENE (HDPE) PIPE. THE PIPE MATERIAL SHALL BE A TYPE III, CLASS C, CATEGORY 5, P34 MATERIAL AS DESCRIBED IN ASTM D 1248. MINIMUM CELL CLASSIFICATION VALUES OF THE PIPE MATERIAL SHALL BE (345434C) AS REFERENCED IN ASTM D 3350. THE DR SHALL BE AS SPECIFIED. THE FITTINGS SUPPLIED UNDER THIS SPECIFICATION SHALL BE MOLDED FROM A POLYETHYLENE COMPOUND HAVING A CELL CLASSIFICATION EQUAL TO OR EXCEEDING THE CELL CLASSIFICATION OF THE PIPE SUPPLIED UNDER THIS SPECIFICATION. PIPE SHALL MEET THE APPLICABLE REQUIREMENTS OF ASTM F714 POLYETHYLENE (PE) PLASTIC PIPE (DR-PR) BASED ON OUTSIDE DIAMETER OR ASTM D1248 AND ASTM D3350. THE DENSITY SHALL BE 0.941-0.957 GMS/CM WHEN, TESTED IN ACCORDANCE WITH ASTM D 1505. THE MELT FLOW SHALL BE NO GREATER THAN 0.11GMS/10 MIN. WHEN TESTED IN ACCORDANCE WITH ASTM D 1238 -CONDITION E. THE FLEX MODULUS SHALL BE GREATER THAN 110,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM D 790. THE TENSILE STRENGTH AT YIELD SHALL BE GREATER 3,200 PSI WHEN TESTED IN ACCORDANCE WITH ASTM D 638. ECSR ENVIRONMENTAL STRESS CRACK RESISTANCE SHALL BE IN EXCESS OF 5,000 HOURS WITH ZERO FAILURES WHEN TESTED IN ACCORDANCE WITH ASTM D 1693 CONDITION C. HYDROSTATIC DESIGN BASIC SHALL BE 1,600 PSI AT 23°C WHEN TESTED IN ACCORDANCE WITH ASTM D 2837.

18) THE CONTRACTOR SHALL INSTALL PIPE MADE OF VIRGIN MATERIALS. THE PIPE SHALL CONTAIN NO RECYCLED COMPOUND EXCEPT THAT GENERATED IN THE MANUFACTURER'S OWN PLANT FOR RESIN OF THE SAME SPECIFICATION FROM THE SAME RAW MATERIAL PIPE.

19) FITTINGS SHALL BE MARKED WITH THE MANUFACTURER'S NAME (OR TRADE MARK), THE DESIGNATION ASTM D3350 AND ASTM 714, AND THE MANUFACTURER'S CODE IDENTIFYING THE RESIN MANUFACTURER, LOT NUMBER AND DATE OF MANUFACTURE.

20) PIPE AND FITTINGS SHALL BE HOMOGENEOUS THROUGHOUT AND FREE OF SERIOUS ABRASION, CUTTING, OR GOUGING OF THE OUTSIDE SURFACE EXTENDING TO MORE THAN 10 PERCENT OF THE MINIMUM WALL THICKNESS IN DEPTH, CRACKS, KINKING (GENERALLY DUE TO EXCESSIVE OR ABRUPT BENDING), FLATTENING , HOLES, BLISTERS, OR OTHER INJURIOUS DEFECTS. THEY SHALL BE UNIFORM IN COLOR, OPACITY, DENSITY, AND OTHER PHYSICAL PROPERTIES. ANY PIPE AND FITTINGS NOT MEETING THESE CRITERIA SHALL BE REJECTED. THE INNER WALL SHALL BE WHITE OR LIGHT GRAY. YELLOW, BLACK, AND LIGHT PURPLE ARE NOT ACCEPTABLE. THE OUTER WALL SHALL BE BLACK, WHITE, OR LIGHT GRAY. YELLOW AND LIGHT PURPLE ARE NOT ACCEPTABLE.THE AVERAGE OUTSIDE DIAMETER AND WALL THICKNESS OF PIPE AND FITTINGS SHALL IN ACCORDANCE WITH ASTM D2122.

21) PIPE LENGTHS SHALL BE ASSEMBLED IN THE FIELD WITH BUTT-FUSED JOINTS IN ACCORDANCE WITH ASTM D 2657 AND THE PIPE MANUFACTURER'S WRITTEN INSTRUCTIONS SHALL APPLY. BUTT-FUSED JOINTS SHALL HAVE INTERNAL BEAD PROJECTIONS REMOVED. JOINT STRENGTH SHALL BE EQUAL TO OR GREATER THAN THE PIPE AND SHALL INDICATE A DUCTILE RATHER THAN BRITTLE FRACTURE WHEN TESTED.

22) THE FUSION MACHINE SHALL HAVE HYDRAULIC PRESSURE CONTROL FOR FUSING TWO PIPE ENDS TOGETHER AND SHALL BE EQUIPPED WITH GAUGES TO MONITOR FUSION PRESSURES. THE MACHINE SHALL BE EQUIPPED WITH AN ELECTRIC OR GASOLINE ENGINE POWERED FACING UNIT TO SQUARE AND TRIM THE PIPE ENDS SMOOTH AND PROVIDE FULL SURFACE CONTACT WITH THE HEATING PLATE. THE HEATING PLATE ON THE FUSION MACHINE SHALL BE ELECTRICALLY HEATED AND THERMOSTATICALLY CONTROLLED WITH A TEMPERATURE GAUGE AND BE CAPABLE OF MAINTAINING 500°F WITH A TOLERANCE OF 10°F. FUSION TEMPERATURE SHALL BE AS RECOMMENDED BY THE PIPE MANUFACTURER. THE HEATER PLATE SHALL BE EQUIPPED WITH SUITABLE MEANS TO MEASURE THE TEMPERATURE OF PLATE SURFACES AND TO ASSURE UNIFORM HEATING SUCH AS THERMOMETERS OR PYROMETERS.

23) ANY REMAINING VOIDS BETWEEN THE PIPE AND BORE SHALL BE BACKFILLED WITH GROUT THAT IS PUMPED INTO THE VOIDED BETWEEN THE HDPE PIPE AND THE BORE HOLE. THE GROUT DESIGN MIX SHALL MEET OR EXCEED 500 PSI COMPRESSIVE STRENGTH AT 28 DAYS TESTED ACCORDANCE WITH ASTM C495 OR C109. CONTRACTOR MAY INCORPORATE GROUT ADDITIVES TO IMPROVE ITS FLOW PROPERTIES, PROVIDED THE MINIMUM COMPRESSIVE STRENGTH REQUIREMENTS ARE MET.

24) SUBMIT CERTIFIED LAB DATA OR MANUFACTURER'S WRITTEN CERTIFICATIONS TO VERIFY THE PHYSICAL PROPERTIES OF THE MATERIALS SUPPLIED UNDER THIS SPECIFICATION.

25) POLYETHYLENE PIPE AND FITTINGS MAY BE REJECTED FOR FAILURE TO MEET ANY OF THE REQUIREMENTS OF THIS SPECIFICATION.

26) THE DIRECTIONAL DRILLING EQUIPMENT SHALL CONSIST OF A DIRECTIONAL DRILLING RIG OF SUFFICIENT CAPACITY TO PERFORM THE BORE AND PULLBACK THE SEWER PIPE, A DRILLING FLUID MIXING, DELIVERY AND RECOVERY SYSTEM OF SUFFICIENT CAPACITY TO SUCCESSFULLY COMPLETE THE BORE, A DRILLING FLUID RECYCLING SYSTEM TO REMOVE SOLIDS FROM THE DRILLING FLUID SO THAT THE FLUID CAN BE RE-USED, A GUIDANCE SYSTEM TO ACCURATELY GUIDE BORING OPERATIONS, A VACUUM TRUCK OF SUFFICIENT CAPACITY TO HANDLE THE DRILLING FLUID VOLUME, PERSONNEL MEETING THE TRAINING REQUIREMENTS, AND ALL OTHER EQUIPMENT REQUIRED TO COMPLETE THE INSTALLATION AS PER THE CONSTRUCTION DOCUMENTS. THE EQUIPMENT SHALL BE IN GOOD, SAFE OPERATING CONDITION WITH SUFFICIENT SUPPLIES, MATERIALS, AND SPARE PARTS ON HAND TO MAINTAIN THE SYSTEM IN GOOD WORKING ORDER FOR THE DURATION OF THIS PROJECT.

27) THE DIRECTIONAL DRILLING MACHINE SHALL CONSIST OF A HYDRAULICALLY POWERED SYSTEM TO ROTATE, PUSH, AND PULL HOLLOW DRIVE PIPE INTO THE GROUND AT A VARIABLE ANGLE WHILE DELIVERING A PRESSURIZED FLUID MIXTURE TO A GUIDABLE DRILL (BORE) HEAD. THE MACHINE SHALL BE ANCHORED TO THE GROUND TO WITHSTAND THE PULLING, PUSHING AND ROTATING PRESSURE REQUIRED TO COMPLETE THE BORE. THE HYDRAULIC POWER SYSTEM SHALL BE SELF-CONTAINED WITH SUFFICIENT PRESSURE AND VOLUME TO POWER DRILLING OPERATIONS. HYDRAULIC SYSTEM SHALL BE FREE OF LEAKS. RIG SHALL HAVE A SYSTEM TO MONITOR AND RECORD MAXIMUM PULL-BACK PRESSURE DURING PULL-BACK OPERATIONS. THE RIG SHALL BE GROUNDED DURING DRILLING AND PULL-BACK OPERATIONS. THERE SHALL BE A SYSTEM TO DETECT ELECTRICAL CURRENT FROM THE DRILLING STRING AND AN AUDIBLE ALARM WHICH AUTOMATICALLY SOUNDS WHEN AN ELECTRICAL CURRENT IS DETECTED.

28) THE DRILL HEAD SHALL BE STEERABLE BY CHANGING ITS ROTATION AND SHALL PROVIDE THE NECESSARY CUTTING SURFACES AND DRILLING FLUID JETS.

29) MUD MOTORS SHALL BE OF ADEQUATE POWER TO TURN THE REQUIRED DRILLING TOOLS.

30) DRILL PIPE SHALL BE CONSTRUCTED OF HIGH QUALITY 4130 SEAMLESS TUBING, GRADE D OR BETTER, WITH A THREADED BOX AND BINS. TOOL JOINTS SHOULD BE HARDENED TO 32RC.

31) A MAGNETIC GUIDANCE SYSTEM (MGS) OR PROVEN GYROSCOPIC SYSTEM SHALL BE USED TO PROVIDE A CONTINUOUS AND ACCURATE DETERMINATION OF THE LOCATION OF THE DRILL HEAD DURING THE DRILLING OPERATION. THE DIRECTIONAL DRILLING GUIDANCE SYSTEM SHALL HAVE THE CAPABILITY OF MEASURING VERTICAL AND HORIZONTAL POSITIONS AND ROLL. THE SYSTEM SHALL OBTAIN AN ACCURACY RANGE WITHIN ONE-INCH OF THE ACTUAL POSITION OF THE DRILLING HEAD. IT SHALL ENABLE THE DRILLER TO GUIDE THE DRILL HEAD BY PROVIDING IMMEDIATE INFORMATION ON THE TOLL FACE, AZIMUTH (HORIZONTAL DIRECTION) AND INCLINATION (VERTICAL DIRECTION). THE CONTRACTOR SHALL COMPUTE THE POSITION IN THE X, Y, AND Z AXIS RELATIVE TO THE GROUND SURFACE A MINIMUM OF EVERY 5 FEET. THE GUIDANCE SYSTEM SHALL BE OF A PROVEN TYPE AND SHALL BE OPERATED BY PERSONNEL TRAINED AND EXPERIENCED WITH THE SYSTEM. FURNISH MANUFACTURER'S CERTIFICATE THAT THE GUIDANCE SYSTEM MEETS THE REQUIREMENTS OF THIS PROJECT. THE CONTRACTOR SHALL DEMONSTRATE A VIABLE METHOD TO ELIMINATE ERROR. CONTRACTOR SHALL SUBMIT CALIBRATION RESULTS FROM WITHIN THE LAST YEAR SHOWING THAT THE EQUIPMENT IS WITHIN TOLERANCE. THE GUIDANCE SYSTEM SHALL BE CAPABLE OF GENERATING A PLOT OF THE BORE HOLE SURVEY FOR THE PURPOSE OF AN AS-BUILT DRAWING.

32) A SELF-CONTAINED, CLOSED, DRILLING FLUID MIXING SYSTEM SHALL BE OF SUFFICIENT SIZE TO MIX AND DELIVER DRILLING FLUID. MIXING SYSTEM SHALL CONTINUALLY AGITATE THE DRILLING FLUID DURING DRILLING OPERATIONS.

33) DRILLING FLUID SHALL BE A MIXTURE OF WATER AND BENTONITE CLAY. THE FLUID SHALL BE INERT.

34) THE DRILLING FLUID PUMPING SYSTEM SHALL HAVE A CAPACITY TO PROVIDE AN ADEQUATE FLOW RATE AND PRESSURE TO FACILITATE THE HDD OPERATION AS DEFINED IN THE CONSTRUCTION DOCUMENTS. THE DELIVERY SYSTEM SHALL HAVE FILTERS IN-LINE TO PREVENT SOLIDS FROM BEING PUMPED INTO THE DRILL PIPE. CONNECTIONS BETWEEN THE PUMP AND DRILL PIPE SHALL BE LEAK-FREE. USED DRILLING FLUID AND DRILLING FLUID SPILLED DURING DRILLING OPERATIONS SHALL BE CONTAINED AND CONVEYED TO THE DRILLING FLUID RECYCLING SYSTEM. A BERM, MINIMUM OF 12" HIGH, SHALL BE MAINTAINED AROUND DRILL RIGS, DRILLING FLUID MIXING SYSTEM, ENTRY AND EXIT PITS, AND DRILLING FLUID RECYCLING SYSTEM TO PREVENT SPILLS INTO THE SURROUNDING ENVIRONMENT. PUMPS AND OR VACUUM TRUCKS OF SUFFICIENT SIZE SHALL BE IN PLACE TO CONVEY EXCESS DRILLING FLUID FROM CONTAINMENT AREAS TO STORAGE AND RECYCLING FACILITIES.

35) THE DRILLING FLUID RECYCLING SYSTEM SHALL SEPARATE SAND, DIRT AND OTHER SOLIDS FROM THE DRILLING FLUID TO RENDER THE DRILLING FLUID REUSABLE. SPOILS SEPARATED FROM THE DRILLING FLUID WILL BE STOCKPILED FOR LATER USE OR DISPOSAL.

36) PIPE ROLLERS SHALL BE OF SUFFICIENT SIZE TO FULLY SUPPORT THE WEIGHT OF THE PIPE WHILE BEING HYDRO-TESTED AND DURING PULL-BACK OPERATIONS. SUFFICIENT NUMBER OF ROLLERS SHALL BE USED TO PREVENT EXCESS SAGGING OF THE PIPE. THE HDPE PIPE SHALL NOT BE DRAGGED ACROSS THE PAVEMENT.

37) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IMPLEMENT MEANS AND PROCEDURES COMPATIBLE WITH ANTICIPATED GROUND CONDITIONS. THE CONTRACTOR SHALL HAVE A REPRESENTATIVE WHO IS THOROUGHLY KNOWLEDGEABLE OF THE EQUIPMENT AND HDD PROCEDURES PRESENT AT THE JOB SITE DURING THE ENTIRE INSTALLATION AND AVAILABLE TO ADDRESS IMMEDIATE CONCERNS AND EMERGENCY OPERATIONS.

38) THE ENGINEER MUST BE NOTIFIED IMMEDIATELY IF ANY CONDITION IS ENCOUNTERED THAT STOPS THE FORWARD PROGRESS OF DRILLING OPERATIONS. WHEN IT IS DETERMINED THAT IT IS IMPOSSIBLE TO CONTINUE DRILLING OPERATIONS, THE CONTRACTOR SHALL DETERMINE THE BEST COURSE OF ACTION. THE CONTRACTOR MAY BE ALLOWED TO ABANDON THE COMPLETED PORTION IN PLACE AND START A NEW HOLE AS DIRECTED BY THE ENGINEER.

39) CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE RESTORATION OF ANY DAMAGE CAUSED BY HEAVING, SETTLEMENT, SEPARATION OF PAVEMENT, ESCAPING DRILLING FLUID, OR THE DIRECTIONAL DRILLING OPERATION, AT NO COST TO THE CITY.

40) THE INSTALLATION OF THE SEWER PIPE INTO THE BORE HOLE SHALL BE ON THE SAME DAY THAT THE BORE IS COMPLETED TO ENSURE THE NECESSARY SUPPORT EXISTS.

41) THE REQUIRED PIPING SHALL BE ASSEMBLED IN A MANNER THAT MINIMIZES THE OBSTRUCTION OF ADJACENT ROADWAYS OR PUBLIC ACTIVITIES. THE CONTRACTOR SHALL ERECT TEMPORARY FENCING AROUND ENTRY AND EXIT PIPES STAGING AREAS AS NEEDED.

42) THE CONTRACTOR SHALL FOLLOW THE PIPELINE ALIGNMENT AS SHOWN ON THE DRAWINGS, WITHIN THE SPECIFIED TOLERANCES. IF ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR APPROVAL PRIOR TO MAKING THE ADJUSTMENTS.

43) IN THE EVENT OF DIFFICULTIES AT ANY TIME DURING HDD OPERATIONS REQUIRING THE COMPLETE WITHDRAWAL FROM THE BORE, THE CONTRACTOR MAY BE ALLOWED TO WITHDRAW AND ABANDON THE BORE AND BEGIN A SECOND ATTEMPT AT A LOCATION APPROVED BY THE PROJECT ENGINEER.

44) ESTABLISH AN ENTRY ANGLE HOLE SO THAT THE CURVATURE OF THE PILOT HOLE DOES NOT EXCEED THE ALLOWABLE BENDING RADIUS OF THE HDPE PIPE.

45) AT COMPLETION OF THE PILOT HOLE DRILLING, PROVIDE ENGINEER TABULATIONS OF THE HORIZONTAL AND VERTICAL ALIGNMENT.

46) AFTER THE PILOT HOLE IS COMPLETED, THE CONTRACTOR SHALL ENLARGE THE HOLE BY PRE- REAMING (AS NEEDED), AND INSTALL A SWIVEL TO THE REAMER AND COMMENCE PULLBACK OPERATIONS.

47) UPON SUCCESSFUL COMPLETION OF PILOT HOLE, CONTRACTOR WILL REAM BORE HOLE TO A SIZE NECESSARY TO SAFELY AND PROPERLY INSTALL THE PIPE. REAMING DIAMETER SHALL NOT EXCEED L.5 TIMES THE DIAMETER OF THE PIPE PRODUCT BEING INSTALLED.

48) THE PRODUCT PIPE BEING PULLED INTO THE BORE SHALL BE PROTECTED AND SUPPORTED BY ROLLERS SO THAT IT MOVES FREELY AND IS NOT DAMAGED BY DEBRIS ON THE GROUND DURING INSTALLATION. THE HDPE PIPE MAY NOT BE DRAGGED ACROSS THE PAVEMENT.

49) PULLBACK FORCES SHALL NOT EXCEED THE ALLOWABLE PULLING FORCES FOR THE PRODUCT PIPE. THE THICKNESS OF THE PIPE WILL BE INCREASED, AT NO ADDITIONAL COST TO OWNER, IF PULLBACK FORCES ARE ANTICIPATED TO EXCEED THE ALLOWABLE PULLING FORCE ON THE SPECIFIED PIPE.

50) THE CONTRACTOR SHALL ALLOW SUFFICIENT LENGTHS OF PRODUCT PIPE TO EXTEND PAST THE TERMINATION POINT (4" MINIMUM) TO ALLOW CONNECTIONS TO ADJACENT PIPE SECTIONS OR APPURTENANCES. PULLED PIPE SHALL BE ALLOWED 12 HOURS OF STABILIZATION PRIOR MAKING TIE-INS OR PRIOR TO BACKFILL GROUTING OF THE PIPE. THE LENGTH OF EXTRA PRODUCT PIPE SHALL BE AT THE CONTRACTOR'S DISCRETION.

51) AFTER THE PIPE IS IN PLACE, THE CONTRACTOR SHALL PROVIDE AND RUN A MANDREL TO CHECK FOR ANOMALIES IN THE FORM OF BUCKLES, DENTS, EXCESSIVE OUT-OF-ROUNDNESS, AND ANY OTHER DEFORMATIONS. THE MANDREL RUN SHALL BE CONSIDERED ACCEPTABLE IF THE SURVEY RESULTS INDICATE THAT THERE ARE NO SHARP ANOMALIES (E.G. DENTS, BUCKLES, GOUGES, AND INTERNAL OBSTRUCTIONS) GREATER THAN 2 PERCENT OF NOMINAL PIPE DIAMETER, OR EXCESSIVE OVALITY GREATER THAN 5 PERCENT OF THE NOMINAL DIAMETER.

52) AFTER THE PIPE IS IN PLACE, THE CONTRACTOR SHALL PROVIDE AND RUN A MANDREL TO CHECK FOR ANOMALIES IN THE FORM OF BUCKLES, DENTS, EXCESSIVE OVALITY, AND ANY OTHER DEFORMATIONS. MANDREL TESTING SHALL BE COMPLETED A MINIMUM OF 30 DAYS AFTER INSTALLATION OF THE SEWER PIPE. THE MANDREL RUN SHALL BE CONSIDERED ACCEPTABLE IF THE SURVEY RESULTS INDICATE THAT THERE ARE NO SHARP ANOMALIES (E.G. DENTS, BUCKLES, GOUGES, AND INTERNAL OBSTRUCTIONS) GREATER THAN 2 PERCENT OF NOMINAL PIPE DIAMETER, OR EXCESSIVE OVALITY GREATER THAN 5 PERCENT OF THE NOMINAL DIAMETER.

53) ONCE THE PIPE IS INSTALLED, IT SHALL BE TESTED AT A MINIMUM PRESSURE OF 25 PSI AT THE INVERT OF THE UPSTREAM MANHOLE FOR 4 HOURS TO VERIFY THAT THE PIPE OR PIPE JOINTS HAVE NO CRACKS AS A RESULT OF THE INSTALLATION. AIR TESTING IS NOT ACCEPTABLE FOR THE HDPE SEWER. PIPE NOT HOLDING THE SPECIFIED PRESSURE FOR THE TEST DURATION SHALL BE REMOVED FROM THE HOLE, REPAIRED, AND INSTALLED AND TESTED AGAIN.THE COST OF THE HYDROSTATIC TEST SHALL BE INCLUDED IN THE BID PRICE FOR THE APPROPRIATE SECTIONS OF CONDUIT.

54) DRILLING FLUID SHALL BE A MIXTURE OF WATER AND BENTONITE CLAY. THE FLUID SHALL BE INERT. DISPOSAL OF EXCESS DRILLING FLUID AND SPOILS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR WHO SHALL COMPLY WITH ALL RELEVANT REGULATIONS, RIGHT-OF-WAY, WORK SPACE, AND PERMIT AGREEMENTS. EXCESS DRILLING FLUID AND SPOILS SHALL BE DISPOSED OF PROPERLY. THE CONTRACTOR IS RESPONSIBLE FOR TRANSPORTING ALL EXCESS DRILLING FLUID AND SPOILS TO THE DISPOSAL SITE AND PAYING ANY DISPOSAL COSTS. EXCESS DRILLING FLUID AND SPOILS SHALL BE TRANSPORTED IN A MANNER THAT PREVENTS ACCIDENTAL SPILLAGE ONTO ROADWAYS. EXCESS DRILLING FLUID AND SPOILS SHALL NOT BE DISCHARGED INTO SANITARY OR STORM SYSTEMS, DITCHES OR WATERWAYS. DRILLING FLUID RETURNS (CAUSED BY FRACTURING OF FORMATIONS) AT LOCATIONS OTHER THAN THE ENTRY AND EXIT POINTS SHALL BE MINIMIZED. THE CONTRACTOR SHALL IMMEDIATELY CLEAN UP ANY DRILLING FLUID THAT INADVERTENTLY SURFACES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING PROVISIONS FOR A CLEAN WATER SUPPLY FOR MIXING OF DRILLING FLUID.

55) SEGMENTS OF PIPE HAVING CUTS OR GOUGES ON THE EXTERIOR OF THE PIPE IN EXCESS OF 10% OF THE MINIMUM WALL THICKNESS OF THE PIPE SHALL BE CUT OUT AND REMOVED OR THAT SECTION OF PIPE WILL BE REJECTED. THE UNDAMAGED PORTIONS OF THE PIPE SHALL BE REJOINED USING THE BUTT FUSION JOINING METHOD.

56) SECTIONS OF POLYETHYLENE PIPE SHOULD BE JOINED INTO CONTINUOUS LENGTHS ON THE JOB SITE ABOVE GROUND. THE JOINING METHOD SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS. THE BUTT FUSION EQUIPMENT USED IN THE JOINING PROCEDURE SHALL BE CAPABLE OF MEETING ALL CONDITIONS, ALIGNMENT, AND FUSION PRESSURE. PIPE LENGTHS TO BE JOINED BY THERMAL BUTT-FUSION SHALL BE OF THE SAME TYPE, GRADE, AND CLASS OF POLYETHYLENE COMPOUND AND SUPPLIED FROM THE SAME RAW MATERIAL SUPPLIER.

57) FUSED SEGMENTS OF PIPE SHALL BE HANDLED SO AS TO AVOID DAMAGE TO THE PIPE. WHEN LIFTING FUSED SECTIONS OF PIPE, CHAINS OR CABLE TYPE CHOKERS SHOULD BE AVOIDED. NYLON SLINGS ARE PREFERRED. CARE SHOULD BE EXERCISED TO AVOID CUTTING OR GOUGING THE PIPE.

58) THE PIPE FUSION MACHINE SHALL HAVE GUIDE RODS SHALL BE IN A PLANE THAT PASSES THROUGH THE CENTERLINE OF THE PIPE THUS CANCELING THE BENDING FORCES IN THE MACHINE CAUSED BY THE FUSION FORCES. THE CLAMP SHALL BE MECHANICALLY OR HYDRAULICALLY OPERATED AND HAVE THE STRENGTH TO "ROUND UP" THE PIPE CLOSE TO THE FUSED JOINT AND CLAMP EACH PIECE OF PIPE ON CONTINUING STRAIGHT CENTERLINE. THE JAWS SHALL BE DESIGNED FOR QUICK INSTALLATION AND REMOVAL OF INSERTS FOR SMALLER PIPE SIZES. THE HEATER-PLATE SHALL BE ELECTRICALLY HEATED, AND THERMOSTATICALLY TEMPERATURE CONTROLLED. THE SURFACE SHALL BE SMOOTH WITH A HIGH QUALITY RYTON COATING. THE MACHINE SHALL BE CAPABLE OF MAINTAINING THE SURFACE TEMPERATURE SET AT THE PIPE MANUFACTURER'S RECOMMENDED TEMPERATURE RANGE. THE HEATER PLATE SHALL BE EQUIPPED WITH AN INDICATING THERMOMETER BUT SURFACE TEMPERATURES SHOULD BE CHECKED WITH A PYROMETER OCCASIONALLY. THE HEATER SURFACE SHALL BE KEPT CLEAN AND FREE FROM PLASTIC ACCUMULATION. THE HYDRAULICALLY OPERATED MACHINES SHALL HAVE A PRESSURE REGULATOR TO PRESET THE CORRECT PRESSURE FOR THE DESIRED FUSION FORCE, AND THERE SHALL BE AN AUXILIARY SYSTEM TO CONTROL "FEED'" RATE FOR THE PIPE FACE-OFF. EACH MACHINE SHALL BE PERMANENTLY EQUIPPED WITH A CHART SHOWING CORRECT FUSION PRESSURE FOR EACH PIPE SIZE AND WALL THICKNESS (DR).

59) THE CONTRACTOR IS REQUIRED TO MAINTAIN THE WORK SITE IN A NEAT AND ORDERLY CONDITION THROUGHOUT THE PERIOD OF WORK AND AFTER COMPLETING THE WORK AT EACH SITE, REMOVE DEBRIS, SURPLUS MATERIAL AND TEMPORARY STRUCTURES ERECTED BY THE CONTRACTOR. THE SITE MUST BE RESTORED TO ITS FORMER CONDITION.

HULL
BROWNFIELDS
SHALE OIL & GAS
WASTE MANAGEMENT
ENVIRONMENTAL
ALTERNATIVE ENERGY
6397 Emerald Parkway
Suite 200
Dublin, Ohio 43016
Phone: (614) 793-8777
Fax: (614) 793-9070
www.hullinc.com

Ohio Utilities Protection Service
Call 811 before you dig
800-362-2764

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

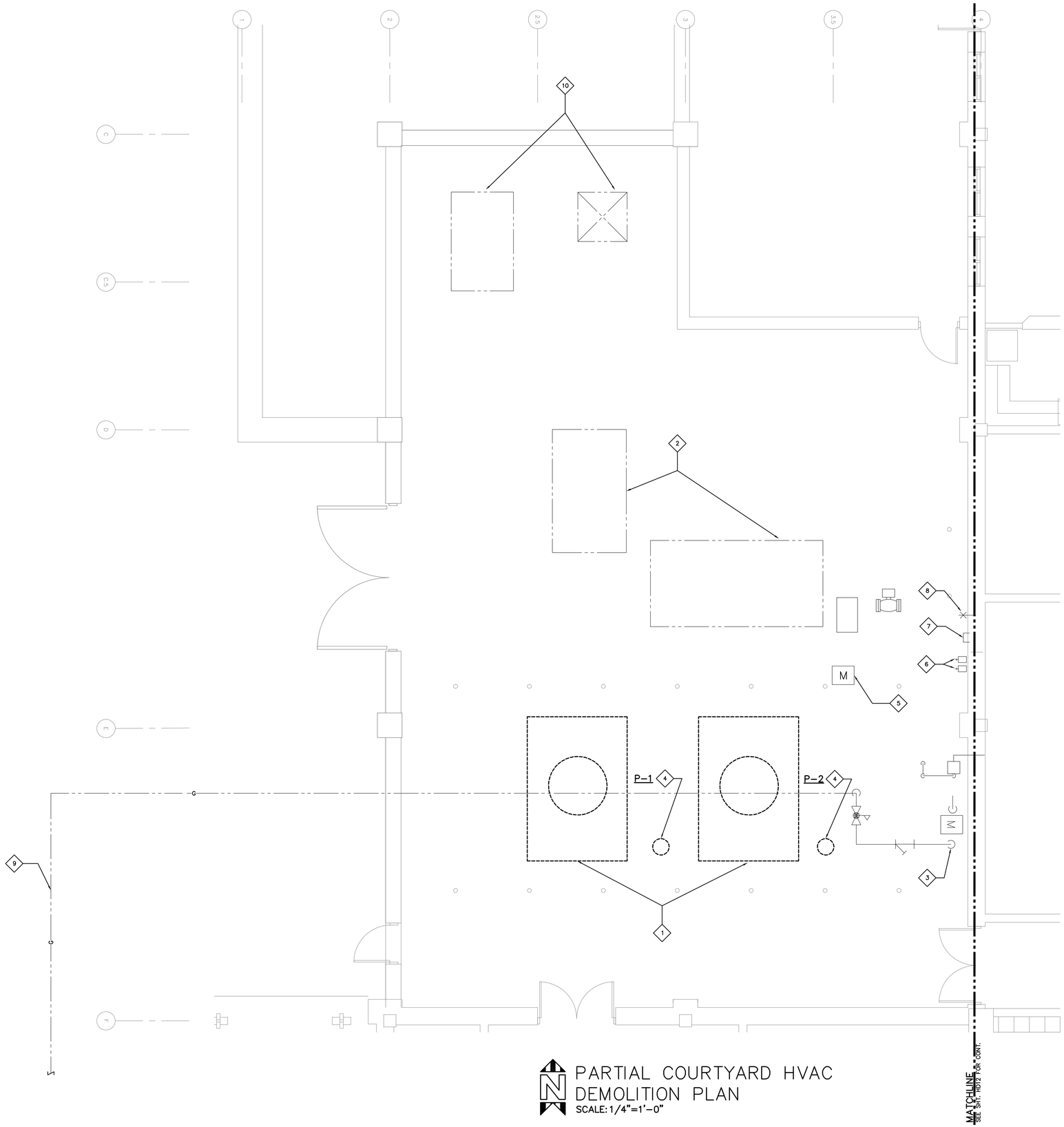
sheet title
MISCELLANEOUS NOTES

CADD#:

project number
13390

drawn	JTH
design	JFB
checked	JFB
issued for	date
BID	11/24/14

sheet
C3.0



PARTIAL COURTYARD HVAC
DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION NOTES ◇

1. REMOVE EVAPCO MODEL AT 8-212B COOLING TOWER AND ALL ASSOCIATED PIPING/HEAT TRACE/AND CONTROLS.
2. COMBINATION HEAT AND POWER (CHP UNIT TO REMAIN. CHP UNIT SHALL REMAIN IN OPERATION CONTINUOUSLY DURING THE RENOVATIONS.
3. BUILDING NATURAL GAS MAIN, METER SETTING, AND PIPING TO REMAIN.
4. SALVAGE CONDENSER WATER PUMPS AND REMOVE ALL PIPING INCLUDING ISOLATION VALVES OF PUMP. SPECIALTIES (VALVES, STRAINER, VIBRATION ISOLATION, ETC.). TURN PUMPS OVER TO OWNER.
5. CHP GAS METER TO REMAIN.
6. WALL-MOUNTED POST INDICATOR VALVE TO REMAIN.
7. WATER MOTOR GONG AND ALARM BELL TO REMAIN.
8. WALL HYDRANT TO REMAIN.
9. EXISTING GAS MAIN TO REMAIN. VERIFY ALL UNDERGROUND UTILITY LOCATIONS.
10. ELECTRICAL EQUIPMENT TO REMAIN. SEE ELECTRICAL DRAWINGS.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4183
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL COURTYARD
HVAC DEMOLITION
PLAN

CADD#: HD11-13390.DWG

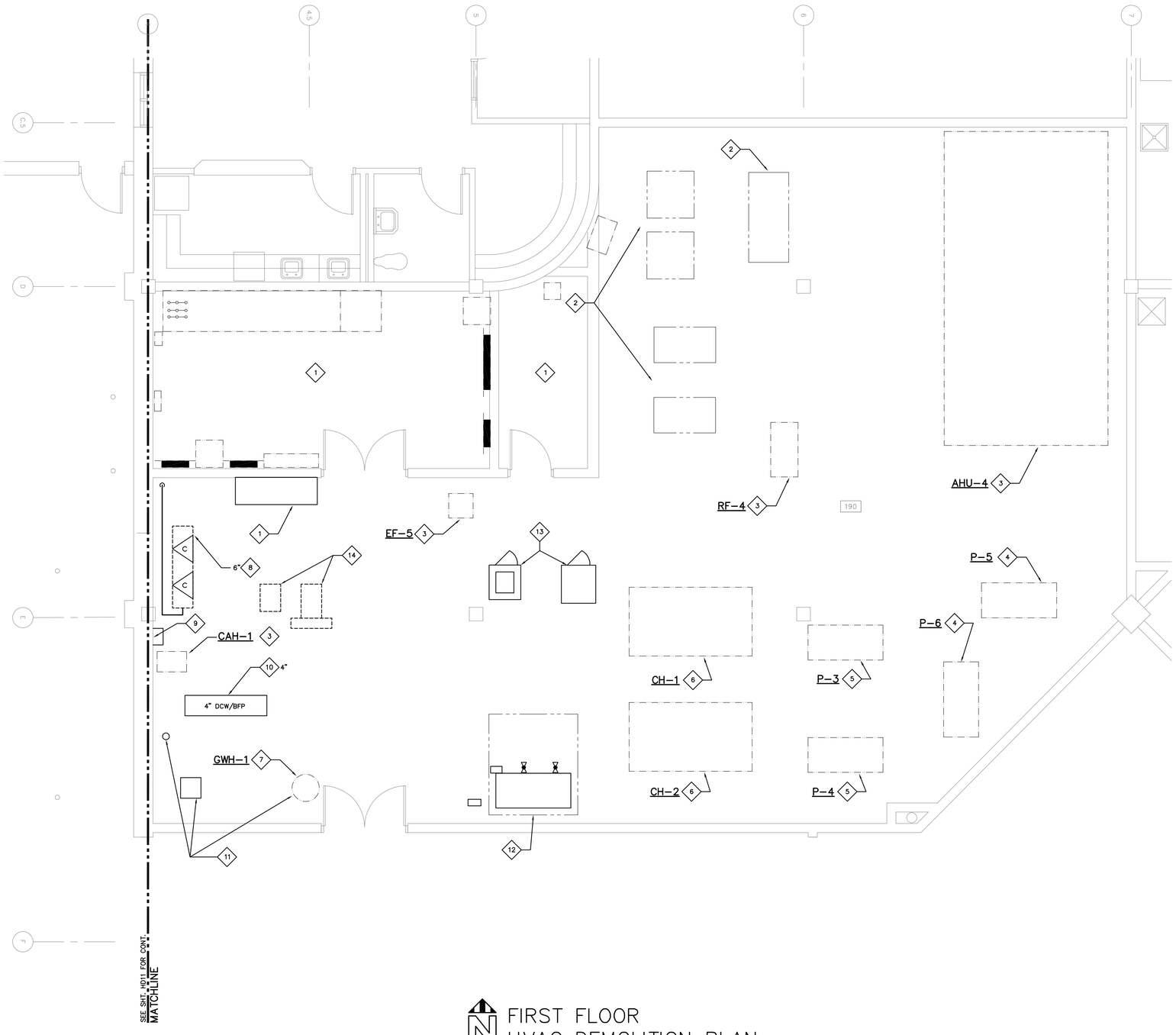
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
HD11



FIRST FLOOR
HVAC DEMOLITION PLAN
SCALE: 1/4"=1'-0"

DEMOLITION NOTES ◇

1. ELECTRICAL EQUIPMENT TO REMAIN. SEE ELECTRICAL DRAWINGS.
2. BUILDING HEATING HOT WATER BOILERS AND PUMPS TO REMAIN.
3. BUILDING AIR HANDLING UNIT OR EXHAUST FAN TO REMAIN.
4. SECONDARY CHILLED WATER SUPPLY PUMP TO REMAIN.
5. CHILLER PRIMARY CHILLED WATER SUPPLY PUMP TO REMAIN.
6. CHILLER TO REMAIN. CHILLED WATER SUPPLY, CHILLED WATER RETURN, AND ALL ASSOCIATED CHILLED WATER PIPING TO REMAIN. CONTRACTOR SHALL REMOVE CONDENSER WATER SUPPLY, CONDENSER WATER RETURN, AND ALL ASSOCIATED CONTROLS. SEE PIPING SCHEMATIC.
7. ALL DOMESTIC WATER SOTRAGE TANKS AND DOMESTIC WATER HEATERS, PUMPS, AND PIPING IN THIS ROOM/AREA TO REMAIN.
8. BUILDING FIRE SUPPRESSION WATER SERVICE (METER/BFP) TO REMAIN.
9. MAKE-UP WATER CONNECTION FOR CONDENSER WATER LOOP TO REMAIN.
10. DOMESTIC WATER SERVICE (METER/BFP) TO REMAIN.
11. DOMESTIC HOT WATER BOILER, EXPANSION TANK, AND WATER STORAGE TANK TO REMAIN.
12. POOL HEATING HEAT EXCHANGERS, PUMPS AND ASSOCIATED PIPING TO REMAIN.
13. LAUNDRY EQUIPMENT TO REMAIN.
14. SALVAGE LAKOS SEPARATOR AND CHEMICAL TREATMENT EQUIPMENT ASSOCIATED WITH COOLING TOWERS. TURN OVER TO THE OWNER.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4767
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
FIRST FLOOR
HVAC
DEMOLITION
PLAN

CADD#: HD12-13390.DWG

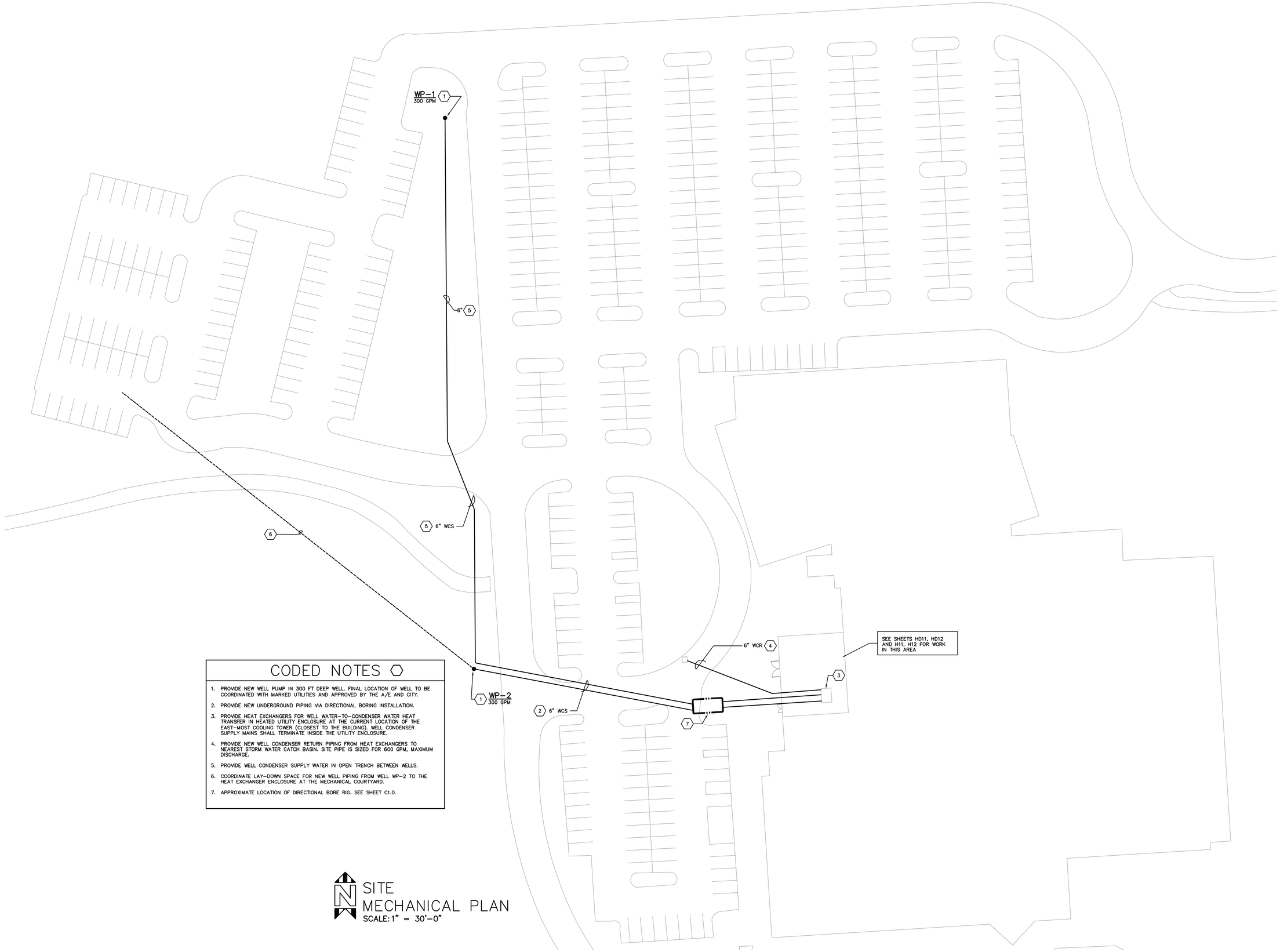
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
HD12



CODED NOTES

1. PROVIDE NEW WELL PUMP IN 300 FT DEEP WELL. FINAL LOCATION OF WELL TO BE COORDINATED WITH MARKED UTILITIES AND APPROVED BY THE A/E AND CITY.
2. PROVIDE NEW UNDERGROUND PIPING VIA DIRECTIONAL BORING INSTALLATION.
3. PROVIDE HEAT EXCHANGERS FOR WELL WATER-TO-CONDENSER WATER HEAT TRANSFER IN HEATED UTILITY ENCLOSURE AT THE CURRENT LOCATION OF THE EAST-MOST COOLING TOWER (CLOSEST TO THE BUILDING). WELL CONDENSER SUPPLY MAINS SHALL TERMINATE INSIDE THE UTILITY ENCLOSURE.
4. PROVIDE NEW WELL CONDENSER RETURN PIPING FROM HEAT EXCHANGERS TO NEAREST STORM WATER CATCH BASIN. SITE PIPE IS SIZED FOR 600 GPM, MAXIMUM DISCHARGE.
5. PROVIDE WELL CONDENSER SUPPLY WATER IN OPEN TRENCH BETWEEN WELLS.
6. COORDINATE LAY-DOWN SPACE FOR NEW WELL PIPING FROM WELL WP-2 TO THE HEAT EXCHANGER ENCLOSURE AT THE MECHANICAL COURTYARD.
7. APPROXIMATE LOCATION OF DIRECTIONAL BORE RIG. SEE SHEET C1.0.

N

SITE
MECHANICAL PLAN
SCALE: 1" = 30'-0"

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
SITE
HVAC
PLAN

CADD#: H01-13390.DWG

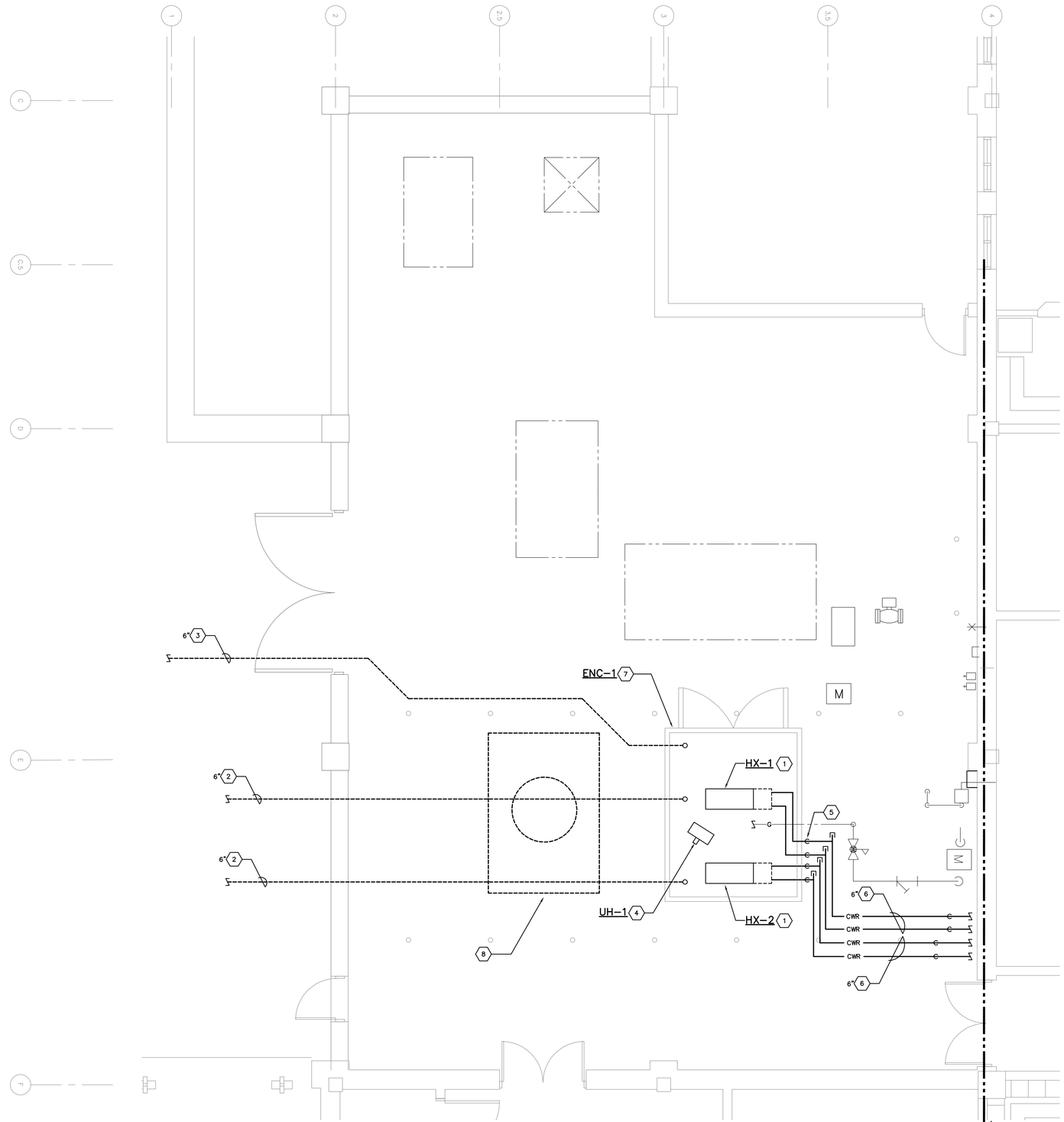
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
H01



PARTIAL COURTYARD
HVAC PLAN
SCALE: 1/4"=1'-0"

MATCHLINE
SEE SHT. H11 FOR CONT.

CODED NOTES

1. NEW GEOTHERMAL WELL WATER TO CONDENSER WATER HEAT EXCHANGER IN HEATED ENCLOSURE.
2. WELL WATER SUPPLY LINE. SEE SITE PLAN FOR CONTINUATION.
3. WELL WATER DISCHARGE LINE. SEE SITE PLAN FOR CONTINUATION. TRENCH AND BACKFILL PER SPECIFICATIONS.
4. UNIT HEATER IN NEW HEAT EXCHANGER ENCLOSURE.
5. DROP CONDENSER PIPING TO 1 FT ABOVE GRADE. ROUTE ALONG BOLLARDS TO BUILDING.
6. HEAT TRACE NEW CONDENSER WATER PIPING.
7. ENC-1; PROVIDE ENCLOSURE FOR NEW HEAT EXCHANGERS.
8. EXISTING COOLING TOWER AND PUMP TO REMAIN ACTIVE UNTIL WELL SYSTEM HEAT EXCHANGERS ARE OPERATIONAL. PROVIDE TEMPORARY PIPING AS NEEDED TO KEEP TOWER OPERATIONAL.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4183
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL COURTYARD
HVAC PLAN

CADD#: H12-13390.DWG

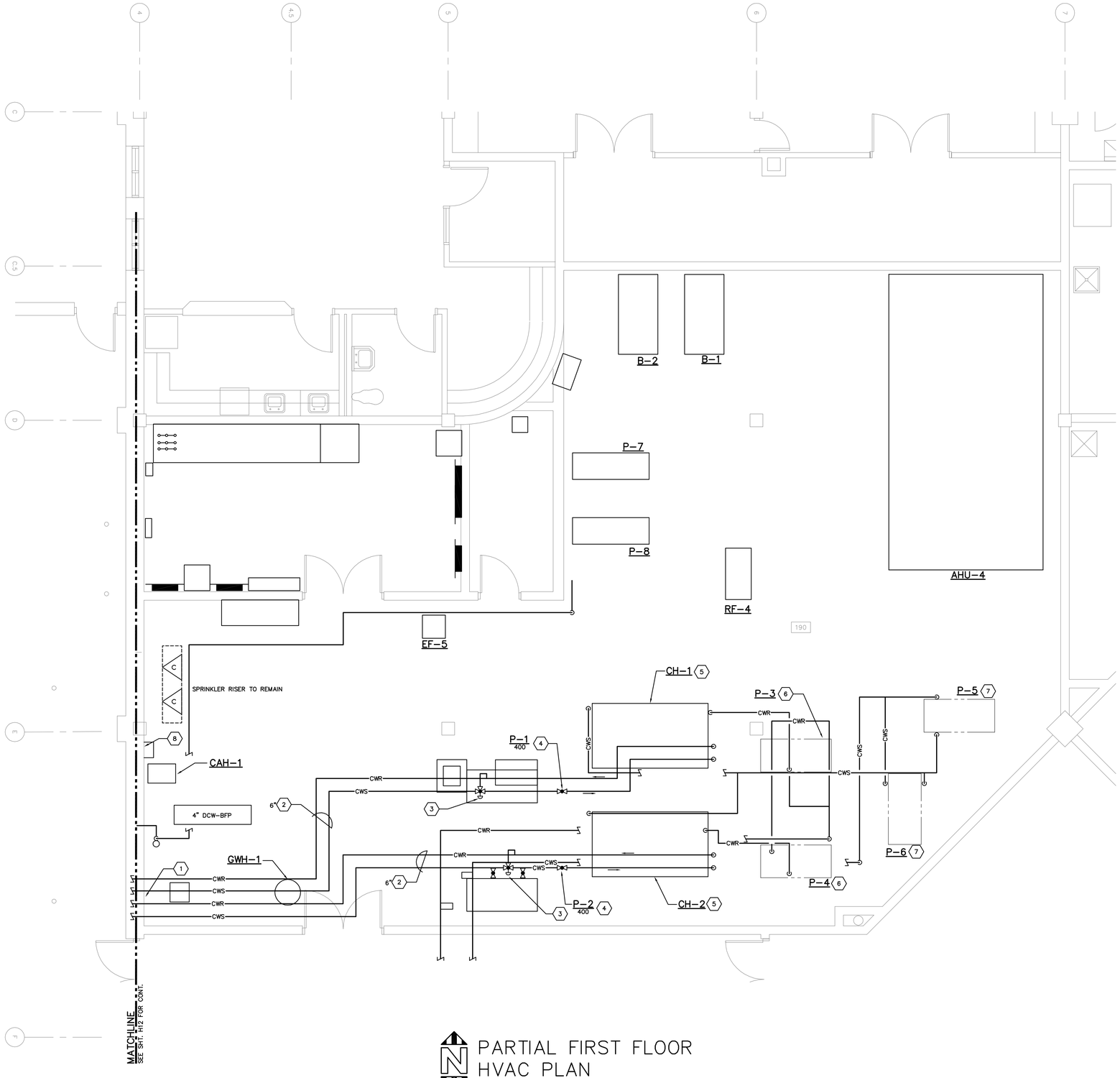
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED
PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
H11



PARTIAL FIRST FLOOR
HVAC PLAN
SCALE: 1/4"=1'-0"

CODED NOTES

1. REUSE WALL OPENINGS FOR NEW CONDENSER PIPING. (ONE NEW WALL PENETRATION IS REQUIRED)
2. COORDINATE FINAL ROUTE OF PIPING WITH EXISTING PIPING AND EQUIPMENT.
3. 3-WAY BYPASS VALVE ON CONDENSER WATER LOOP, CONTROLLED BY A DIFFERENTIAL PRESSURE SIGNAL CONNECTED BETWEEN THE CONDENSER AND EVAPORATOR REFRIGERANT LINES. CONTROL INTERFACE SHALL BE CAREFULLY COORDINATED WITH THE CHILLER MANUFACTURER.
4. CONDENSER WATER PUMP SHALL PROVIDE A CONSTANT VOLUME OF WATER FLOW THROUGH THE CHILLER'S CONDENSER BARREL.
5. EXISTING CHILLER TO REMAIN. PIPING AND CONTROLS ON THE CHILLED WATER SIDE OF THE CHILLER WILL NOT BE CHANGED AS PART OF THIS PROJECT. PROVIDE NEW CONDENSER WATER PIPING AND CONTROLS AS NEEDED TO CONNECT THE CHILLER TO THE NEW GEOTHERMAL WELL WATER TO CONDENSER WATER HEAT EXCHANGER AS SHOWN. AT LEAST ONE CHILLER SHALL REMAIN IN OPERATION AT ALL TIMES.
6. PRIMARY CHILLED WATER PUMP AND PIPING TO REMAIN.
7. SECONDARY CHILLED WATER PUMP AND PIPING TO REMAIN.
8. EXTEND AND CONNECT MAKE-UP WATER SUPPLY TO EACH CONDENSER WATER PIPING SYSTEM.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4183
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL FIRST FLOOR HVAC PLAN

CADD#: H11-13390.DWG

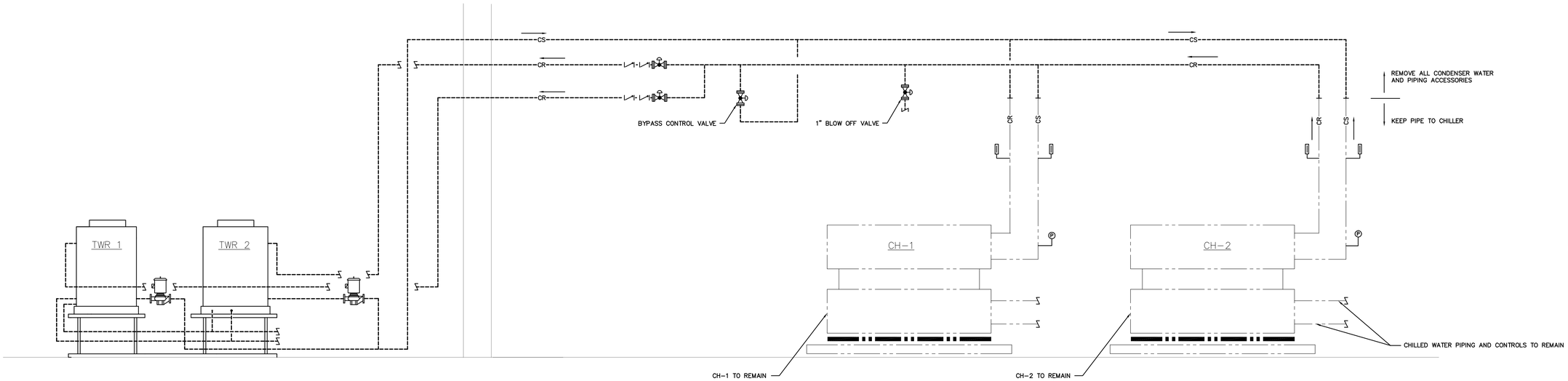
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

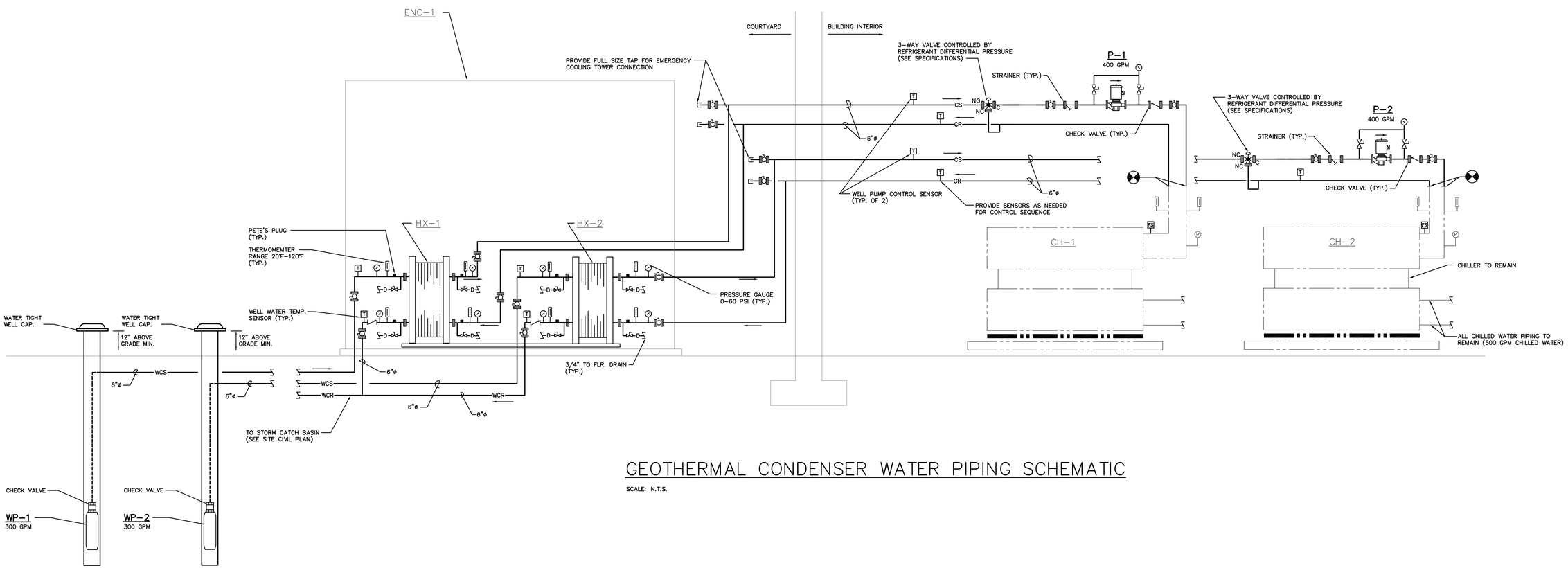
issued for	date
BID	11/24/14

sheet
H12



EXISTING CONDENSER WATER SCHEMATIC

SCALE: N.T.S.



GEOTHERMAL CONDENSER WATER PIPING SCHEMATIC

SCALE: N.T.S.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4183
FAX: (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
MECHANICAL SCHEDULES

CADD#: H22-13390.DWG

project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
H21

HVAC GENERAL NOTES

1. THE HVAC CONTRACTOR SHALL COORDINATE WITH PLUMBING, FIRE PROTECTION, ELECTRICAL, STRUCTURE AND OTHER TRADES TO ACHIEVE THE CEILING HEIGHTS INDICATED ON THE ARCHITECTURAL DRAWINGS. CAREFUL COORDINATION BETWEEN ALL TRADES WILL BE REQUIRED ON THE JOB SITE TO ATTAIN THESE CEILING HEIGHTS. PROVIDE ADDITIONAL OFFSETS WHERE REQUIRED DUE TO FIELD CONDITIONS.
2. INSTALL BALANCING DAMPERS AS SHOWN AND AS REQ'D FOR PROPER BALANCING OF AIR HANDLING SYSTEMS. REFER TO THE SPECIFICATIONS FOR AIR BALANCING REQUIREMENTS.
3. MOUNT ALL THERMOSTATS 48" ABOVE FINISH FLOOR UNLESS OTHERWISE NOTED ON THE PLANS.
4. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATIONS OF ALL LOUVERS AND EQUIPMENT MOUNTED IN EXTERIOR WALLS.
5. DUCT DIMENSIONS SHOWN ARE ACTUAL INSIDE OPENING SIZES AND SHALL NOT BE SMALLER WHERE DUCTS ARE LINED, THE OUTSIDE SHEETMETAL DIMENSION MUST BE INCREASED TO COMPENSATE FOR THE DUCT LINER.
6. NO DUCTWORK OR PIPING IS TO RUN AB. ELEC. OR TELE. EQUIP.
7. RUN ALL WATER SUPPLY AND RETURN MAINS LEVEL UNLESS OTHERWISE NOTED.
8. COORD. EXACT LOCATION OF DUCT RISERS W/ BLDG. STRUCTURE.
9. ALL DUCTS AND PIPES AB. CLG. UNLESS OTHERWISE NOTED.
10. RUN ALL DRAIN LINES INDIRECT TO NEAREST FLOOR DRAIN OR HUB DRAIN.
11. REFER TO ARCH. REFLECTED CLG. PLAN FOR EXACT LOCATION OF DIFFUSERS, GRILLES, ETC.
12. FLEXIBLE DUCTWORK MAY BE USED AS TERMINAL DUCT ONLY, WITH LENGTHS NOT TO EXCEED 5 FT.
13. INSTALL AIR VENTS AT HIGH POINTS OF SYSTEM, AS SHOWN ON DRAWINGS AND AS REQ'D. FOR PROPER AIR VENTING OF SYSTEM.
14. ALL PIPING PENETRATIONS THROUGH RATED STRUCTURES SHALL BE FIRESTOPPED. REFER TO SHEET H2.02 FOR FIRESTOPPING DETAILS. REFER TO ARCH. DRAWINGS FOR LOCATIONS OF FIRE RATED STRUCTURES.
15. THE LOCATIONS OF ALL FIRE OR FIRE/SMOKE DAMPERS SHALL BE IDENTIFIED W/ 1/2" HIGH LETTERS ON THE BOTTOM OF THE CEILING GRID.
16. OPNGS. THROUGH ROOF BY GEN. CONTR. FURN. AND SETTING OF PREFABRICATED CURBS AND FANS BY HVAC CONTR.
17. NOTIFY GEN. CONTR. OF SIZE AND LOCATION OF ALL RECESSES AND OPNGS. REQ'D FOR HVAC WORK.
18. THE HVAC CONTR. IS RESPONSIBLE FOR FIRESTOPPING AT ALL HVAC RELATED PENETRATIONS OF FIRE AND SMOKE RATED STRUCTURES, FLOORS AND PARTITIONS. REFER TO ARCHITECTURAL FLR. PLANS FOR LOCATIONS OF ALL RATED STRUCTURES.
19. PIPING RUNOUTS TO UNITS BELOW MAINS TO BE TAKEN FROM BOTTOM OF MAINS AT 45° PITCH DN. TO UNITS. RUNOUTS TO UNITS AB. MAINS TO BE TAKEN FROM TOP OF MAINS AT 45° PITCH UP TO UNITS. PITCH 1" IN 10'-0".
20. ALL DUCT & PIPE RISERS SHALL BE SUPPORTED AT EACH FLOOR. HVAC CONTR. SHALL PROVIDE ALL SUPPORT STEEL REQUIRED.
21. SUPPORT ALL PIPE AT INTERVALS AS NOTED IN SPECIFICATIONS.
22. PROVIDE AIRTIGHT A.D. IN DUCTS ADJACENT TO ALL AUTOMATIC DAMPERS FIRE/SMOKE DAMPERS AND ELSEWHERE AS REQUIRED TO ACCESS DUCT ACCESSORIES.
23. INSTALL ALL HEAT PUMPS W/ CODE REQUIRED CLEARANCE IN FRONT OF ALL ELECTRICAL AND CONTROL PANELS.
24. ALL FIRE DAMPERS, SMOKE DAMPERS & COMBINATION DAMPERS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION DETAILS.
25. ALL TRANSFER DUCTS & ALL EXHAUST DUCTS FOR IN-LINE CABINET VENTILATION DUCTS SHALL BE LINED.
26. CALL BEFORE YOU DIG: CONTACT THE OHIO UTILITIES PROTECTION SERVICE, OUPS, AT 800-362-2764. A MINIMUM OF FIVE BUSINESS DAYS BEFORE START OF ANY UNDERGROUND WORK. EXISTING SITE CIVIL DRAWINGS ARE AVAILABLE FOR CONTRACTOR'S REVIEW.
27. CONTRACTOR SHALL COORDINATE ALL WORK TO AVOID INTERRUPTION OF CHILLED WATER SUPPLY TO THE DUBLIN RECREATION CENTER. ALL INTERRUPTIONS SHALL BE SCHEDULED AT LEAST 10 BUSINESS DAYS IN ADVANCE WITH THE A/E AND THE CITY, AND SHALL OCCUR DURING NON-BUSINESS HOURS. CONTRACTOR SHALL MAINTAIN THE EXISTING COOLING TOWERS IN OPERATION UNTIL THE NEW WELL PUMPS AND ASSOCIATED DIRECT-BORE SUPPLY PIPING ARE INSTALLED. FOR ALL INTERRUPTIONS TO THE CHILLED WATER SUPPLY, CONTRACTOR SHALL WORK CONTINUOUSLY UNTIL CHILLED WATER SUPPLY IS RESTORED.
28. COORDINATE NEW CONDENSER WATER SYSTEM AND ASSOCIATED PIPING WITH EXISTING MECHANICAL AND ELECTRICAL SYSTEMS, EQUIPMENT, PIPING, CONDUITS, ETC., LOCATED IN THE MECHANICAL COURTYARD AND MECHANICAL ROOM. INTERRUPTION TO ANY MECHANICAL OR ELECTRICAL SERVICE REQUIRES A MINIMUM OF 10 BUSINESS DAYS OF ADVANCE NOTICE TO THE A/E AND THE CITY.
29. SEE CIVIL DRAWINGS FOR ADDITIONAL SITE PIPING SCOPE AND WORK REQUIREMENTS.
30. ALL SITE PIPING SHALL BE RUN A MINIMUM OF 5 FT BELOW GRADE. FINAL ROUTE OF PIPING SHALL BE CARFULLY COORDINATED WITH THE EXISTING UTILITIES ON SITE. PRESSURE TEST PIPING BEFORE AND AFTER INSTALLATION UNDERGROUND.
31. DOCUMENT ALL EXISTING CONDITIONS PRIOR TO THE START OF WORK. EXISTING CHILLERS AND PUMPS TO REMAIN ARE IN OPERATING CONDITION. CONTRACTOR SHALL NOTE ANY REQUIRED REPAIRS TO EQUIPMENT PRIOR TO THE START OF WORK, AND SHALL BE RESPONSIBLE FOR ALL REPAIRS REQUIRED FOR THE RESTORATION OF PROPER OPERATION OF EXISTING EQUIPEMENT AT THE COMPLETION OF THE PROJECT, UNLESS NOTED OTHERWISE PRIOR TO THE START OF WORK.
32. SYSTEM START-UP: CONTRACTOR SHALL CONTACT THE CHILLER MANUFACTURER (TRANE) TO COORDINATE CHILLER START-UP AND COMMISSIONING. INCLUDE TWO DAYS OF TRANE ON-SITE SERVICES IN THE SCOPE OF WORK.
33. PHASED DEMOLITION: CONTRACTOR SHALL COORDINATE DEMOLITION OF COOLING TOWERS AND PIPING TO MAINTAIN AT LEAST ONE CHILLER IN OPERATION AT ALL TIMES. COOLING TOWER "CT-1" IS TO REMAIN IN OPERATION UNTIL THE WELLS AND UNDERGROUND PIPING ARE INSTALLED, AND NEW HEAT EXCHANGERS ARE IN PLACE IN THE NEW HEAT EXCHANGER ENCLOSURE. ONCE WELL OPERATION IS DEMONSTRATED, THE REMAINING COOLING TOWER CAN BE REMOVED, WITH TEMPORARY PIPING CONNECTIONS BETWEEN THE HEAT EXCHANGERS AND CONDENSING PIPING OF THE CHILLERS. CONTRACTOR MAY PROPOSE ALTERNATIVE PIPING/CONSTRUCTION PROVISIONS THAT ACHIEVE MINIMAL INTERRUPTION OF THE CHILLED WATER SERVICE.

MECHANICAL ABBREVIATIONS

AB.	ABOVE	H.B.	HOSE BIBB
A.D.	ACCESS DOOR	HTR.	HEATER
A.F.F.	ABOVE FINISHED FLOOR	HTG.	HEATING
APPROX.	APPROXIMATELY	H & A/C	HEATING & AIR CONDITIONING
AUTO. CONT.	AUTOMATIC CONTROL	INV. ELEV.	INVERT ELEVATION
BTM.	BOTTOM	J. R.	JANITOR RECEPTOR
BLDG.	BUILDING	LAV.	LAVATORY
CAB.	CABINET	MAN. DPR.	MANUAL DAMPER
CAP.	CAPACITY	M. H.	MANHOLE
C.B.	CATCH BASIN	MFR.	MANUFACTURER
C.I.	CAST IRON	MECH.	MECHANICAL
CLG.	CEILING	M. A.	MIXED AIR
CONC.	CONCRETE	MTD.	MOUNTED
C.O.	CLEAN OUT	NOM.	NOMINAL
CONN.	CONNECT	OPNG.	OPENING
CONTR.	CONTRACTOR	O.A.	OUTSIDE AIR
CONT.	CONTINUATION	PLBG.	PLUMBING
CONV.	CONVECTOR	PRESS.	PRESSURE
COORD.	COORDINATE	P.R.V.	PRESSURE REDUCING VALVE
DTL.	DETAIL	PROP.	PROPELLER
DIA.	DIAMETER	REG.	REGISTER
DIFF.	DIFFUSER	RHC.	REHEAT COIL
DISCH.	DISCHARGE	REQD.	REQUIRED
DN.	DOWN	REL.	RELIEF
D.S.	DOWNSPOUT	R.A.	RETURN AIR
ELEC.	ELECTRICAL	R.D.	ROOF DRAIN
E.W.C.	ELECTRIC WATER COOLER	RM.	ROOM
ELEM.	ELEMENT	SCHED.	SCHEDULE
ELEV.	ELEVATION	S.D.	SHOWER DRAIN
EXH	EXHAUST	SHT.MTL.	SHEET METAL
EXIST.	EXISTING	SH.	SHOWER
FT. HD.	FEET OF HEAD	S.I.	SURFACE INLET
FIN. RAD.	FINNED RADIATION	S.S.	SERVICE SINK
F. DPR.	FIRE DAMPER	STAT.	THERMOSTAT
F. E.	FIRE EXTINGUISHER	S.A.	SUPPLY AIR
F.E.C.	FIRE EXTINGUISHER CABINET	S & R	SUPPLY & RETURN
F.H.C.	FIRE HOSE CABINET	TEMP.	TEMPERATURE
FLEX.	FLEXIBLE	THERM.	THERMOMETER
F & T	FLOAT & THERMOSTATIC	TYP.	TYPICAL
FLR.	FLOOR	T.C.C.	TEMP. CONTROL CONTRACTOR
F.D.	FLOOR DRAIN	UR.	URINAL
FURN.	FURNISH	V.S.P.	VITRIFIED SEWER PIPE
GA.	GAGE	VIB. ISOL.	VIBRATION ISOLATOR
GEN.	GENERAL	V.T.R.	VENT THRU ROOF
GRAV.	GRAVITY	W.	WASTE
GR.	GRILLE	W/	WITH
		W.C.	WATER CLOSET

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
—A—	AIR LINE
—COMB—	COMBINED SEWER
—CW—	DOMESTIC COLD WATER LINE
—CWR—	CHILLED WATER RETURN
—CWS—	CHILLED WATER SUPPLY
—CR—	CONDENSER WATER RETURN
—CS—	CONDENSER WATER SUPPLY
—D—	DRAIN LINE
—F—	FIRE PROTECTION LINE
—G—	GAS LINE
—HPR—	HEAT PUMP RETURN
—HPS—	HEAT PUMP SUPPLY
—HG—	HOT GAS LINE
—HWR—	HEATING WATER RETURN
—HWS—	HEATING WATER SUPPLY
—LIQ—	LIQUID LINE
—LPS—	LOW PRESSURE STEAM
—PHPR—	POND LOOP HEAT PUMP RETURN
—PHPS—	POND LOOP HEAT PUMP SUPPLY
—SAN—	SANITARY LINE
—SMR—	SNOW MELT SUPPLY
—SMS—	SNOW MELT RETURN
—STM—	STORM LINE
—SUCT—	SUCTION LINE
—TW—	DOMESTIC TEMPERED WATER
—V—	VENT LINE
—W—	WATER SERVICE LINE
—WCS—	WELL CONDENSER WATER SUPPLY
—WCR—	WELL CONDENSER WATER RETURN
—180°—	DOMESTIC 180°F WATER
	RETURN RISER
	SUPPLY RISER
	PENDANT TYPE SPRINKLER HEAD
	UPRIGHT TYPE SPRINKLER HEAD
	P-TRAP (PLAN VIEW)
	AIR VENT – PLAN VIEW
	CAPPED LINE
	HOSE BIBB
	EXISTING WORK TO REMAIN
	EXISTING WORK TO BE REMOVED
	RISE OR DROP
	PIPE BRANCH TOP CONNECTION
	PIPE BRANCH BOTTOM CONNECTION
	PIPE ANCHOR
	PIPE FLANGES

SYMBOL	DESCRIPTION
	PIPE UNION
	PIPE GUIDE
	FLEXIBLE PIPE CONNECTION
	FLEXIBLE DUCT
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	TEE WITH NIPPLE & CAP
	PLUGGED TEE
	Y-TYPE STRAINER
	PETE'S PLUG
	COMB. BALANCE & STOP VALVE
	BALL VALVE
	BALL VALVE W/MEMORY STOP
	GATE VALVE (SCREWED BODY)
	DRAIN VALVE WITH HOSE END
	GLOBE VALVE
	GATE VALVE (FLANGED BODY)
	AUTO CONTROL VALVE
	SOLENOID VALVE
	CHECK VALVE
	BUTTERFLY VALVE
	BUTTERFLY VALVE W/MEMORY STOP
	FLOOR OR AREA DRAIN
	THERMOSTAT
	TEMPERATURE SENSOR
	FLOW SWITCH
	THERMOMETER
	CURB BOX & VALVE
	CONNECT TO EXISTING
	THRU FLOOR AS SHOWN
	JANITOR OR SHOWER TRIM
	SUPPLY DUCT UP
	SUPPLY DUCT DOWN
	R.A., O.A., OR EXH. DUCT UP
	R.A., O.A., OR EXH. DUCT DOWN
	ROUND DUCT
	FLAT OVAL DUCT
	SPIN-IN FITTING WITH BALANCE DAMPER
	ELBOW WITH TURNING VANES
	FIRE DAMPER
	MAN. DAMPER
	ACCESS DOOR
	45° BOOT BRANCH TAKEOFF

EQUIPMENT NOTES

HX-1, HX-2

PLATE HEAT EXCHANGER – TACO MODEL PF 205-109-4-NH WITH CARBON STEEL FRAME AND TYPE 304 STAINLESS STEEL PLATES. CONDENSER SIDE: 400 GPM WATER FROM 85.0°F ENTERING TO 70.0°F LEAVING, 9.8 FT. HD. PRESSURE DROP. WELL WATER SIDE: 300 GPM WATER FROM 55.0°F ENTERING TO 74.9°F LEAVING, 5.8 FT. HD. PRESSURE DROP. 3,000,000 BTUH HEAT EXCHANGED, 276.5 SQ. FT. HEAT TRANSFER AREA, 108 PLATES, 110 MAX. PLATE CAPACITY, OVERALL DIMENSIONS 37.3"Lx18.5"Wx46.2"H.

ENC-1

EQUIPMENT ENCLOSURE – TUFF SHED "INDUSTRIAL PRO" EXTERIOR STORAGE SHED. PROVIDE CUSTOM ENCLOSURE, BUILD AROUND THE HEAT EXCHANGERS AND PIPING, NOMINAL 10 FT. x 13 FT. ENCLOSURE SHALL BE COMPLETE WITH GALVANIZED STEEL INSULATED FLOOR, INSULATED WALLS (R-13) WITH INTERIOR WEATHER PROOF FINISH, WOOD FRAMED WALLS 16" ON CENTER, 7/16" ROOF DECK WITH 2X4 RAFTERS AT 24" ON CENTER, 6" EAVE, 5/12 PITCHED ROOF, 96" CLEAR INSIDE HEIGHT, ENTRY DOOR SHALL BE 6 FT WIDE DOUBLE DOORS TO ALLOW MAINTENANCE ACCESS TO ALL INSIDE EQUIPMENT, 5 YEAR WARRANTY ON ALL MATERIALS, 50 YEAR WARRANTY ON SIDING AND TRIM, AND LIFETIME WARRANTY ON SHINGLES. UNIT SHALL BE DESIGNED FOR 40 LBS OF SNOW LOAD AND 90 MPH WINDS, WITH DESIGN SEALED BY AN OHIO-REGISTERED PROFESSONAL ENGINEER. UNIT SHALL ANCHOR TO THE EXISTING CONCRETE, OR SHALL BE PROVIDED WITH PIER FOUNDATIONS. LOCATION OF FOUNDATIONS SHALL BE COORDINATED WITH ALL UNDERGROUND UTILITIES. HEAT, LIGHTS, AND POWER SHALL BE PROVIDED BY ON-SITE CONTRACTORS AS PART OF THIS PROJECT. REFER TO THE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE AND POWER INFORMATION.

PUMP SCHEDULE

MANUFACTURER'S MODEL NUMBER BASED ON BELL & GOSSETT UNLESS OTHERWISE NOTED.

KEY: CC-CLOSE COUPLED END SUCTION; F.C.-FLEXIBLE COUPLED END SUCTION; A.T.L.-ACROSS THE LINE SUB-SUBMERSIBLE; I.L.-IN LINE; V.F.D.-VARIABLE FREQUENCY DRIVE

* ALL PUMPS 1750 RPM UNLESS NOTED OTHERWISE

PUMP NO.	FUNCTION	LOCATION	MFGR. MODEL NUMBER	TYPE	GPM	FT. HD.	EFF. %	SUCT. SIZE	DISCH. SIZE	MOTOR H.P.	BHP REQ'D.	VOLT / PHASE	TYPE MOTOR STARTING	REMARKS
P-1 P-2	CONDENSER WATER	MECH. ROOM	SERIES 80 4x4x9.5	I.L.	400	55	72	4"	4"	7.5	7.4	460 / 3	A.T.L.	1 3
P-3 P-4	PRIMARY CHILLED WATER	MECH. ROOM	1510 4AC	F.C.	503	35	70.9	4"	4"	7.5	6.5	460 / 3	A.T.L.	4
P-5 P-6	SECONDARY CHILLED WATER	MECH. ROOM	1510 5E	F.C.	1005	55	62.4	2.5"	2.5"	5	2.9	460 / 3	A.T.L.	4
WP-1 WP-2	WELL WATER SUPPLY	SUPPLY WELL	GRUNOFOS 300S100-3A	SUB	300	95	66	–	3"	10.0	–	460 / 3	V.F.D.	1 5 2

1. PUMP MOTOR SHALL BE PREMIUM EFFICIENCY TYPE.
2. FURNISH 3 STAGE, 3450 RPM PUMP
3. CONSTANT SPEED PUMP
4. EXISTING TO REMAIN
5. FURNISH WITH GRUNDFOS CUE3X380 VFD

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4183
FAX: (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
MECHANICAL SCHEDULES

CADD#: H22-13390.DWG

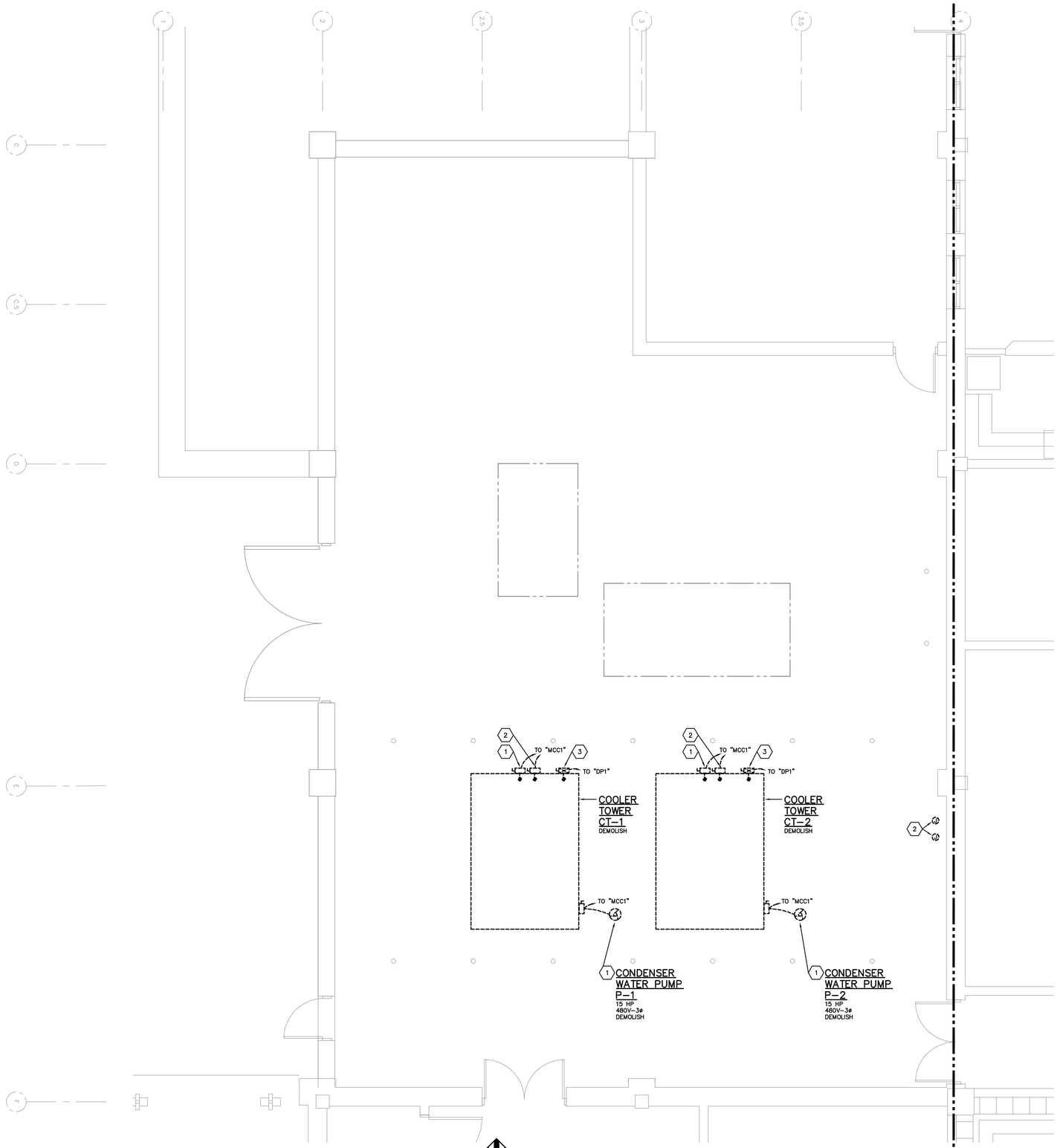
project number
13390

STATE OF OHIO
JOHN B. KERR
E-57818
REGISTERED PROFESSIONAL ENGINEER
10/8/14

drawn	JBK
design	JBK
checked	JBK

issued for	date
BID	11/24/14

sheet
H22



PARTIAL COURTYARD ELEC DEMOLITION PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTES

A. EVERYTHING SHOWN ON THIS DRAWING AND/OR IDENTIFIED IN THE DIVISION 26, 27, AND 28 SPECIFICATIONS IS FURNISHED AND INSTALLED BY THE EC. IF ANY DEVICE, EQUIPMENT, FEEDERS, ETC. IS FURNISHED AND/OR INSTALLED BY ANYONE OTHER THAN THE EC, IT WILL BE SPECIFICALLY NOTED.

B. EC SHALL REVIEW OTHER TRADES DRAWINGS, AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS WITH THE EC'S INSTALLATIONS. FAILURE TO COORDINATE WILL RESULT IN THE EC REMEDYING THE ELECTRICAL CONFLICT(S) AT THE EC'S EXPENSE.

C. FOR VOLTAGE DROP ON 120V CIRCUITS, THE MAXIMUM LENGTHS ARE AS FOLLOWS: #12=90 FEET, #10=145 FEET, AND #8=230 FEET. FOR 277V CIRCUITS, MAXIMUM LENGTHS SHALL BE #12=210 FEET, #10=330 FEET, AND #8=525 FEET. THESE DISTANCES MUST BE FOLLOWED TO MAINTAIN 3% VOLTAGE DROP. WHERE A LIGHT SWITCH OR RECEPTACLE IS BEING FED WITH A WIRE SIZE LARGER THAN #12, INSTALL PIGTAILS FROM THE DEVICE AND TERMINATE TO THE LARGER SIZE WIRE.

D. ALL BACKBOXES LOCATED IN RATED WALLS MUST BE ENCASED IN FIRE PUTTY SEALANT. ALL CONDUITS THAT PASS THRU RATED WALLS MUST BE FIRE SEALED ON BOTH SIDES OF THE WALL. COORDINATE WITH THE ARCHITECT'S DRAWINGS FOR LOCATIONS OF THE RATED WALLS.

E. LOCATION OF DEVICES ARE SCHEMATIC. REFER TO THE ARCHITECT'S INTERIOR ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS FOR ALL DEVICES. LOCATING ON THE NEAREST STUD IS NOT ACCEPTABLE. COORDINATE WITH THE GC TO INSTALL ADDITIONAL BRACING/SUPPORTS, ETC. SO THAT THE ARCHITECT'S DIMENSIONS ARE MAINTAINED.

F. FOR SURFACE MOUNTED AND/OR FLOOR MOUNTED ELECTRICAL SWITCHBOARDS, PANELS, TRANSFORMERS, DISCONNECT SWITCHES, ETC., EC TO INSTALL A 4" HIGH CONCRETE HOUSEKEEPING PAD.

CODED NOTES ⬡

1. COOLING TOWER LOW SPEED. FEEDER IS UNDERGROUND. ABANDON ALL CONDUIT AND REMOVE ALL WIRING BACK TO SOURCE.
2. COOLING TOWER HIGH SPEED. FEEDER IS UNDERGROUND. ABANDON ALL CONDUIT AND REMOVE ALL WIRING BACK TO SOURCE.
3. COOLER TOWER BASIN HEATER. DEMOLISH FEEDER BACK TO SOURCE.
4. DISCONNECT POWER FEED TO HEAT TRACE CABLING TO COOLING TOWER PIPING. REMOVE ALL FEEDERS TO HEAT TRACE CABLING BACK TO SOURCE. REMOVE AND DEMOLISH ALL HEAT TRACE CABLING.

LINE TYPE LEGEND

- · — · — LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- - - - - - - LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
- ——— LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO TO BE FURNISHED AND INSTALLED.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4183
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL COURYARD ELECTRICAL DEMOLITION PLAN

CADD#: ED11-13390.DWG

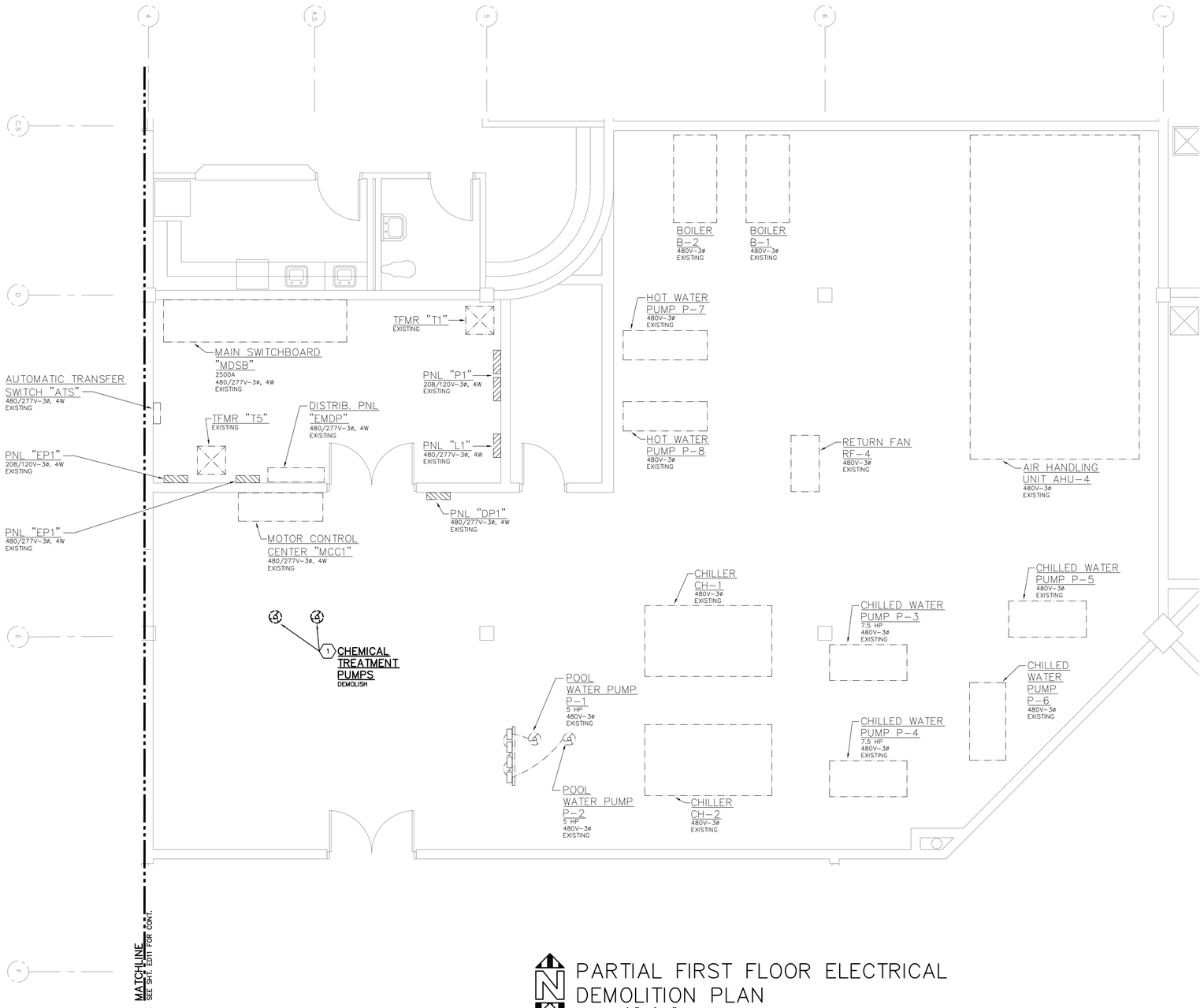
project number
13390

STATE OF OHIO
GREGORY A. RILEY
E-58930
REGISTERED
PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

issued for	date
BID	11/24/14

sheet
ED11



PARTIAL FIRST FLOOR ELECTRICAL DEMOLITION PLAN

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

GENERAL NOTES

A. EVERYTHING SHOWN ON THIS DRAWING AND/OR IDENTIFIED IN THE DIVISION 26, 27, AND 28 SPECIFICATIONS IS FURNISHED AND INSTALLED BY THE EC. IF ANY DEVICE, EQUIPMENT, FEEDERS, ETC. IS FURNISHED AND/OR INSTALLED BY ANYONE OTHER THAN THE EC, IT WILL BE SPECIFICALLY NOTED.

B. EC SHALL REVIEW OTHER TRADES DRAWINGS, AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS WITH THE EC'S INSTALLATIONS. FAILURE TO COORDINATE WILL RESULT IN THE EC REMEDYING THE ELECTRICAL CONFLICT(S) AT THE EC'S EXPENSE.

C. FOR VOLTAGE DROP ON 120V CIRCUITS, THE MAXIMUM LENGTHS ARE AS FOLLOWS: #12=90 FEET, #10=145 FEET, AND #8=230 FEET. FOR 277V CIRCUITS, MAXIMUM LENGTHS SHALL BE #12=210 FEET, #10=330 FEET, AND #8=525 FEET. THESE DISTANCES MUST BE FOLLOWED TO MAINTAIN 3% VOLTAGE DROP. WHERE A LIGHT SWITCH OR RECEPTACLE IS BEING FED WITH A WIRE SIZE LARGER THAN #12, INSTALL PIGTAILS FROM THE DEVICE AND TERMINATE TO THE LARGER SIZE WIRE.

D. ALL BACKBOXES LOCATED IN RATED WALLS MUST BE ENCASED IN FIRE PUTTY SEALANT. ALL CONDUITS THAT PASS THRU RATED WALLS MUST BE FIRE SEALED ON BOTH SIDES OF THE WALL. COORDINATE WITH THE ARCHITECT'S DRAWINGS FOR LOCATIONS OF THE RATED WALLS.

E. LOCATION OF DEVICES ARE SCHEMATIC. REFER TO THE ARCHITECT'S INTERIOR ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS FOR ALL DEVICES. LOCATING ON THE NEAREST STUD IS NOT ACCEPTABLE. COORDINATE WITH THE GC TO INSTALL ADDITIONAL BRACING/SUPPORTS, ETC. SO THAT THE ARCHITECT'S DIMENSIONS ARE MAINTAINED.

F. FOR SURFACE MOUNTED AND/OR FLOOR MOUNTED ELECTRICAL SWITCHBOARDS, PANELS, TRANSFORMERS, DISCONNECT SWITCHES, ETC., EC TO INSTALL A 4" HIGH CONCRETE HOUSEKEEPING PAD.

CODED NOTES ⬡

1. DISCONNECT FEEDER TO PUMPS. PUMPS WILL BE REMOVED BY OTHERS. DEMOLISH FEEDER BACK TO SOURCE.

LINE TYPE LEGEND

- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
- LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO TO BE FURNISHED AND INSTALLED.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4896
FAX: (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL FIRST FLOOR ELECTRICAL DEMOLITION PLAN

CADD#: ED12-13390.DWG

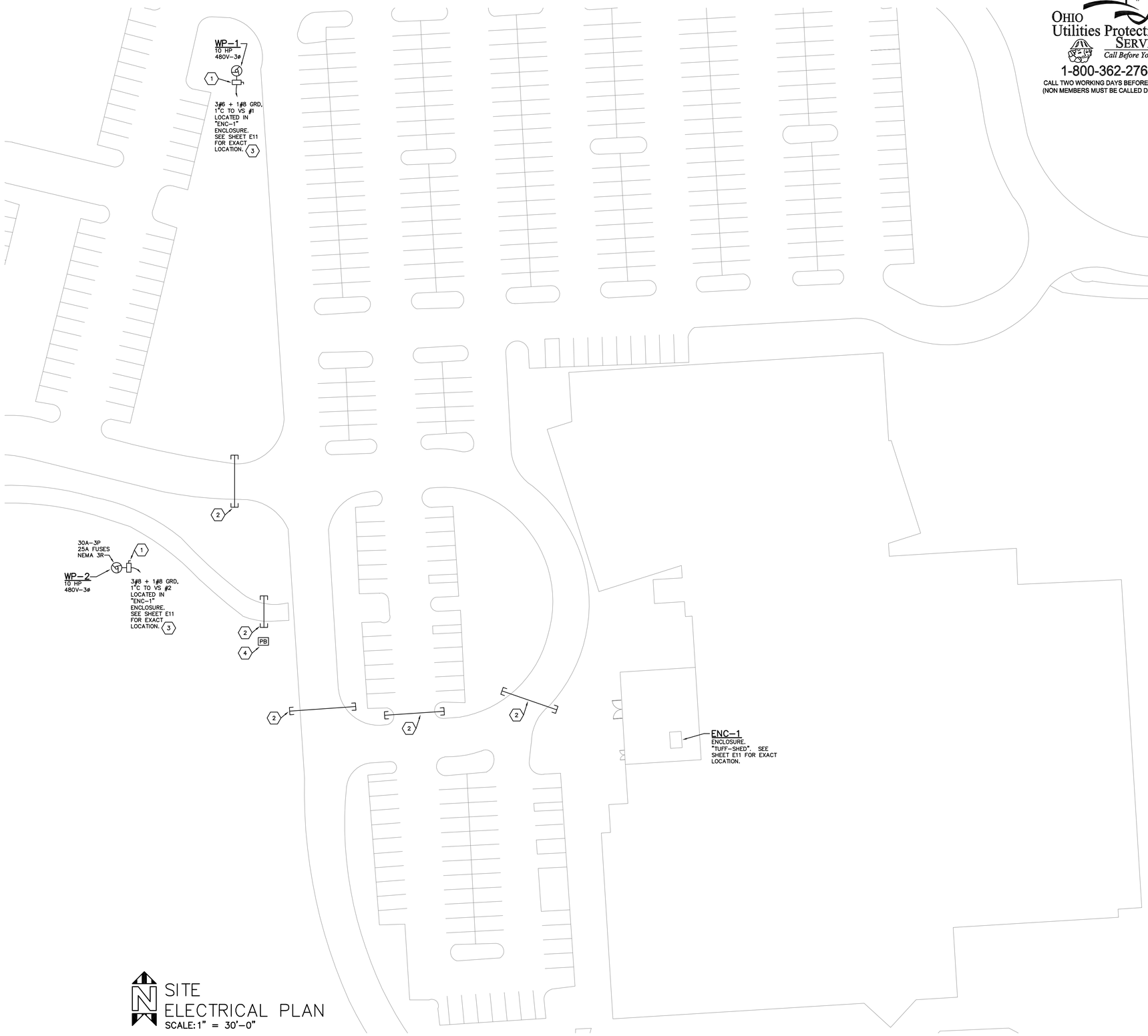
project number
13390

STATE OF OHIO
GREGORY A. RILEY
E-58930
REGISTERED
PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

issued for	date
BID	11/24/14

sheet
ED12



SITE
ELECTRICAL PLAN
SCALE: 1" = 30'-0"

OHIO Utilities Protection SERVICE
Call Before You Dig
1-800-362-2764
CALL TWO WORKING DAYS BEFORE YOU DIG
(NON MEMBERS MUST BE CALLED DIRECTLY)

GENERAL NOTES

A. EVERYTHING SHOWN ON THIS DRAWING AND/OR IDENTIFIED IN THE ELECTRICAL SPECIFICATIONS IS FURNISHED AND INSTALLED BY THE EC. IF ANY DEVICE, EQUIPMENT, FEEDERS, ETC. IS FURNISHED AND/OR INSTALLED BY ANYONE OTHER THAN THE EC, IT WILL BE SPECIFICALLY NOTED.

B. EC SHALL REVIEW OTHER TRADES DRAWINGS, AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS WITH THE EC'S INSTALLATIONS. FAILURE TO COORDINATE WILL RESULT IN THE EC REMEDYING THE ELECTRICAL CONFLICT(S) AT THE EC'S EXPENSE.

C. FOR VOLTAGE DROP ON 120V CIRCUITS, THE MAXIMUM LENGTHS ARE AS FOLLOWS: #12=90 FEET, #10=145 FEET, AND #8=230 FEET. FOR 277V CIRCUITS, MAXIMUM LENGTHS SHALL BE #12=210 FEET, #10=330 FEET, AND #8=525 FEET. THESE DISTANCES MUST BE FOLLOWED TO MAINTAIN 3% VOLTAGE DROP. WHERE A LIGHT SWITCH OR RECEPTACLE IS BEING FED WITH A WIRE SIZE LARGER THAN #12, INSTALL PIGTAILS FROM THE DEVICE AND TERMINATE TO THE LARGER SIZE WIRE.

D. ALL BACKBOXES LOCATED IN RATED WALLS MUST BE ENCASED IN FIRE PUTTY SEALANT. ALL CONDUITS THAT PASS THRU RATED WALLS MUST BE FIRE SEALED ON BOTH SIDES OF THE WALL. COORDINATE WITH THE ARCHITECT'S DRAWINGS FOR LOCATIONS OF THE RATED WALLS.

E. EC SHALL CONTACT OHIO UTILITIES PROTECTION SERVICE TO IDENTIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.

CODED NOTES ⬡

1. INSTALL EQUIPMENT ON METAL UNISTRUT FRAME. PUMP IS SUBMERSIBLE TYPE, APPROXIMATELY 300'-0" BELOW GRADE. FROM LOCAL DISCONNECT SWITCH, EC TO FURNISH AND INSTALL 600V SUBMERSIBLE PUMP WIRING HARNESS DOWN TO PUMP AND MAKE ALL FINAL CONNECTIONS.
2. DIRECTIONAL BORE UNDER EXISTING ROADWAY OR SIDEWALK. DO NOT CUT AND PATCH.
3. EC SHALL PROVIDE ALL TRENCHING AND BACKFILLING FOR HIS WORK. EC SHALL REPAIR / RE-SEED EXISTING GRASS WHERE HIS WORK HAS PASSED THRU EXISTING GRASS / LANDSCAPING.
4. FLUSH WITH GRADE, 11"x18"x18" OPEN BOTTOM POLYMER CONCRETE PULLBOX. QUAZITE #PG1118BA12 (BOX) + #PG1118CA00-17 COVER (WITH "ELECTRIC" LOGO) AND (2) BOLTS. BOX AND COVER SHALL BE GREEN IN COLOR. INSTALL 6" OF GRAVEL UNDER THE BOX FOR DRAINAGE.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
SITE ELECTRICAL PLAN

CADD#: E01-13390.DWG

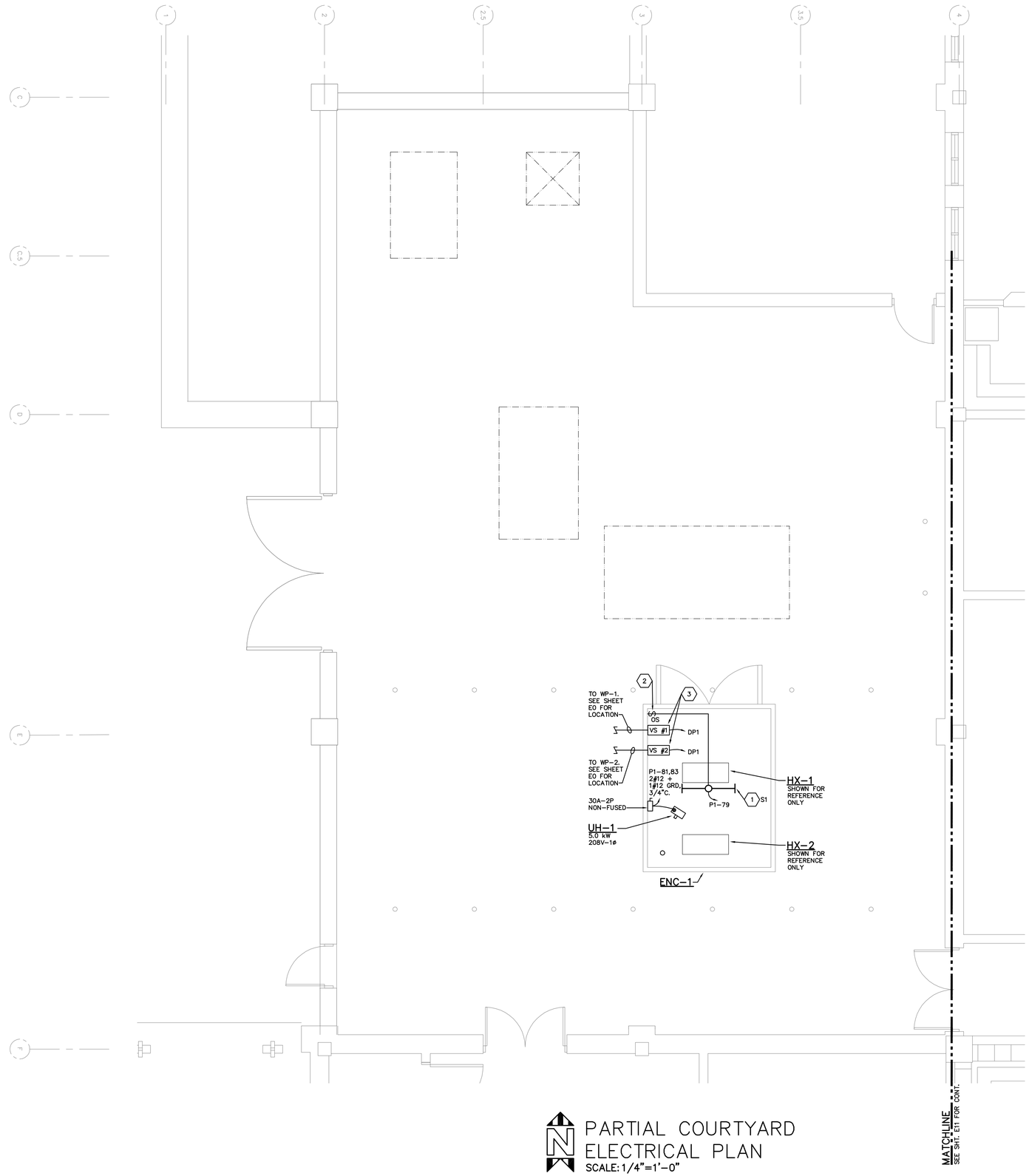
project number
13390

STATE OF OHIO
GREGORY A. RILEY
E-58930
REGISTERED PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

issued for	date
BID	11/24/14

sheet
E01



PARTIAL COURTYARD
ELECTRICAL PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTES

A. EVERYTHING SHOWN ON THIS DRAWING AND/OR IDENTIFIED IN THE ELECTRICAL SPECIFICATIONS IS FURNISHED AND INSTALLED BY THE EC. IF ANY DEVICE, EQUIPMENT, FEEDERS, ETC. IS FURNISHED AND/OR INSTALLED BY ANYONE OTHER THAN THE EC, IT WILL BE SPECIFICALLY NOTED.

B. EC SHALL REVIEW OTHER TRADES DRAWINGS, AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS WITH THE EC'S INSTALLATIONS. FAILURE TO COORDINATE WILL RESULT IN THE EC REMEDYING THE ELECTRICAL CONFLICT(S) AT THE EC'S EXPENSE.

C. FOR VOLTAGE DROP ON 120V CIRCUITS, THE MAXIMUM LENGTHS ARE AS FOLLOWS: #12=90 FEET, #10=145 FEET, AND #8=230 FEET. FOR 277V CIRCUITS, MAXIMUM LENGTHS SHALL BE #12=210 FEET, #10=330 FEET, AND #8=525 FEET. THESE DISTANCES MUST BE FOLLOWED TO MAINTAIN 3% VOLTAGE DROP. WHERE A LIGHT SWITCH OR RECEPTACLE IS BEING FED WITH A WIRE SIZE LARGER THAN #12, INSTALL PIGTAILS FROM THE DEVICE AND TERMINATE TO THE LARGER SIZE WIRE.

CODED NOTES ⬡

1. 4'-0" SHOP LIGHT. DAYBRITE #S-232-120-EB10R SERIES OR EQUAL.
2. LINE VOLTAGE LIGHT SENSOR AND COVERPLATE.. WATTSTOPPER #PW-100-W (WHITE).
3. VS WILL BE FURNISHED BY OTHERS, BUT INSTALLED AND WIRED COMPLETE BY EC.

LINE TYPE LEGEND

- · - · - LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- - - - - - LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
——— LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO TO BE FURNISHED AND INSTALLED.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4183
FAX: (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL COURTYARD
ELECTRICAL PLAN

CADD#: E11-13390.DWG

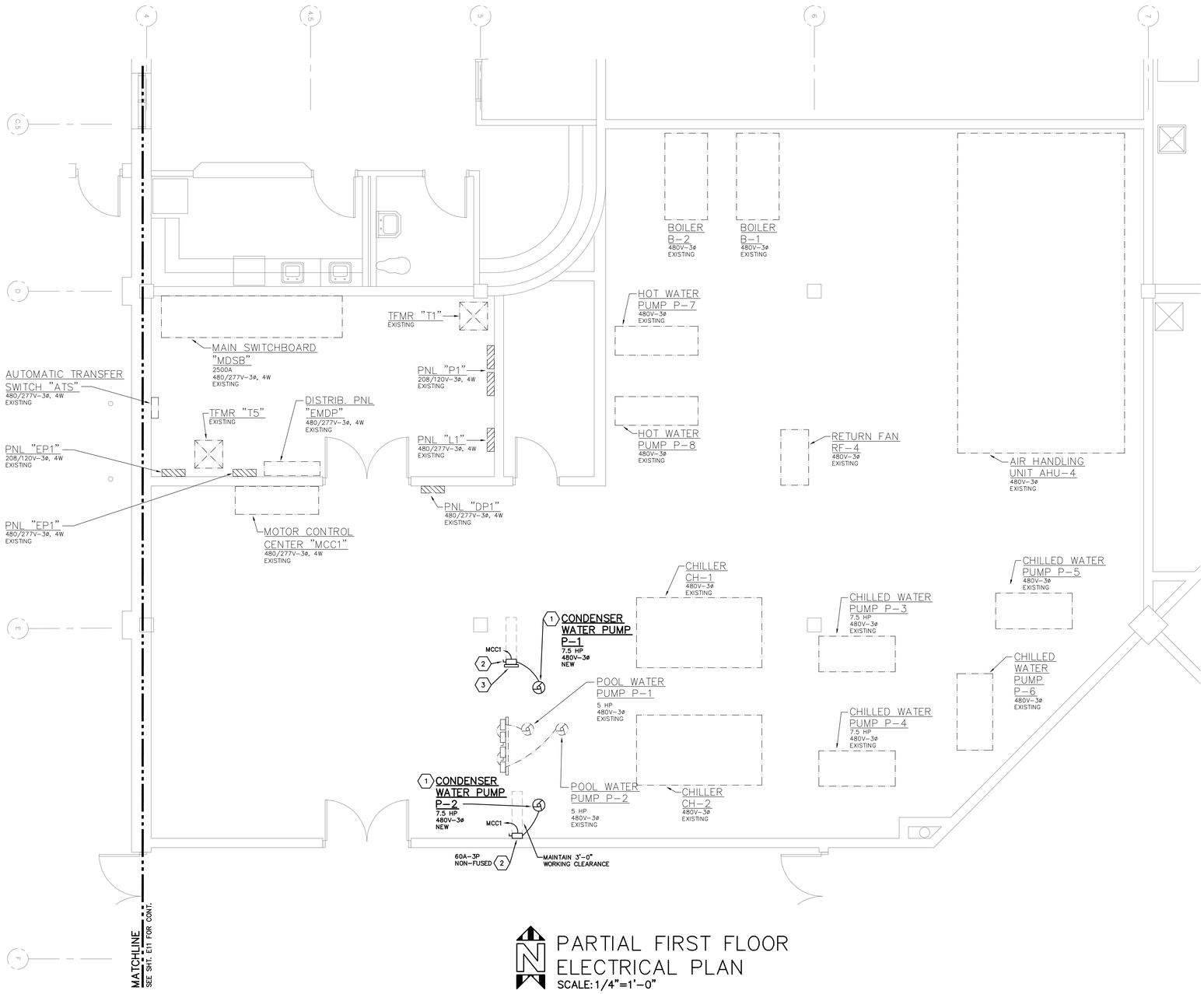
project number
13390

STATE OF OHIO
GREGORY A. RILEY
E-58930
REGISTERED
PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

issued for	date
BID	11/24/14

sheet
E11



PARTIAL FIRST FLOOR ELECTRICAL PLAN

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

GENERAL NOTES

A. EVERYTHING SHOWN ON THIS DRAWING AND/OR IDENTIFIED IN THE DIVISION 26, 27, AND 28 SPECIFICATIONS IS FURNISHED AND INSTALLED BY THE EC. IF ANY DEVICE, EQUIPMENT, FEEDERS, ETC. IS FURNISHED AND/OR INSTALLED BY ANYONE OTHER THAN THE EC, IT WILL BE SPECIFICALLY NOTED.

B. EC SHALL REVIEW OTHER TRADES DRAWINGS, AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS WITH THE EC'S INSTALLATIONS. FAILURE TO COORDINATE WILL RESULT IN THE EC REMEDYING THE ELECTRICAL CONFLICT(S) AT THE EC'S EXPENSE.

C. FOR VOLTAGE DROP ON 120V CIRCUITS, THE MAXIMUM LENGTHS ARE AS FOLLOWS: #12=90 FEET, #10=145 FEET, AND #8=230 FEET. FOR 277V CIRCUITS, MAXIMUM LENGTHS SHALL BE #12=210 FEET, #10=330 FEET, AND #8=525 FEET. THESE DISTANCES MUST BE FOLLOWED TO MAINTAIN 3% VOLTAGE DROP. WHERE A LIGHT SWITCH OR RECEPTACLE IS BEING FED WITH A WIRE SIZE LARGER THAN #12, INSTALL PIGTAILS FROM THE DEVICE AND TERMINATE TO THE LARGER SIZE WIRE.

D. ALL BACKBOXES LOCATED IN RATED WALLS MUST BE ENCASED IN FIRE PUTTY SEALANT. ALL CONDUITS THAT PASS THRU RATED WALLS MUST BE FIRE SEALED ON BOTH SIDES OF THE WALL. COORDINATE WITH THE ARCHITECT'S DRAWINGS FOR LOCATIONS OF THE RATED WALLS.

E. LOCATION OF DEVICES ARE SCHEMATIC. REFER TO THE ARCHITECT'S INTERIOR ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS FOR ALL DEVICES. LOCATING ON THE NEAREST STUD IS NOT ACCEPTABLE. COORDINATE WITH THE GC TO INSTALL ADDITIONAL BRACING/SUPPORTS, ETC. SO THAT THE ARCHITECT'S DIMENSIONS ARE MAINTAINED.

F. FOR SURFACE MOUNTED AND/OR FLOOR MOUNTED ELECTRICAL SWITCHBOARDS, PANELS, TRANSFORMERS, DISCONNECT SWITCHES, ETC., EC TO INSTALL A 4" HIGH CONCRETE HOUSEKEEPING PAD.

CODED NOTES ⬡

1. PUMP WILL BE INSTALLED OVERHEAD. COORDINATE WITH THE MECHANICAL CONTRACTOR IN THE FIELD FOR EXACT LOCATION AND MOUNTING HEIGHT.
2. LOCATION IS SCHEMATIC. COORDINATE EXACT LOCATION IN FIELD WITH EXISTING CONDITIONS, AND LOCATE WHERE 3'-0" WORKING CLEARANCE CAN BE MAINTAINED.
3. CONSTRUCT UNISTRUT FRAME IN FIELD. SECURE TO THE EXISTING CONCRETE SLAB.

LINE TYPE LEGEND

- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
- LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO TO BE FURNISHED AND INSTALLED.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
8130 Wilcox Road
DUBLIN, OHIO 43016
PHONE (614) 766-4896
FAX (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
PARTIAL FIRST FLOOR ELECTRICAL PLAN

CADD#: E12-13390.DWG

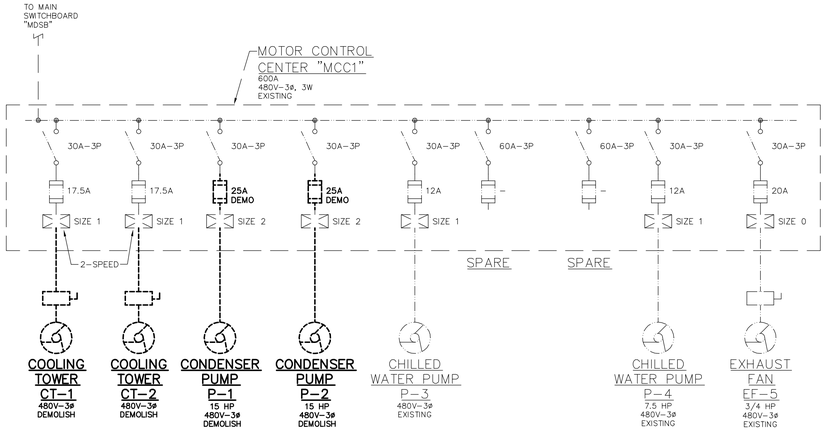
project number
13390

STATE OF OHIO
GREGORY A. RILEY
E-58930
REGISTERED PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

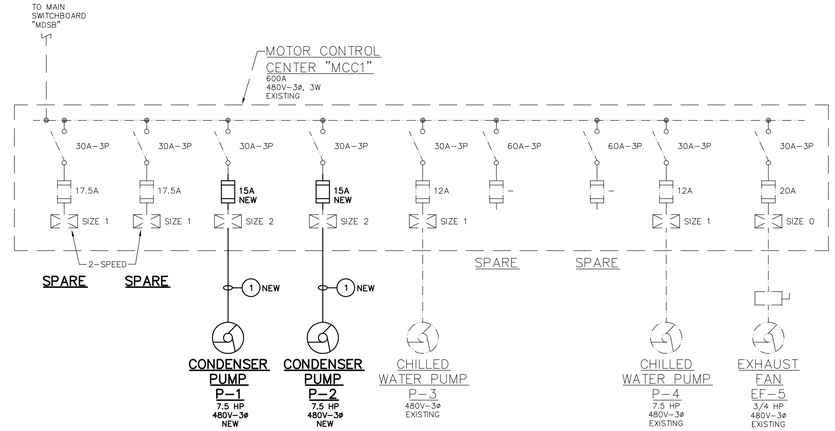
issued for	date
BID	11/24/14

sheet
E12



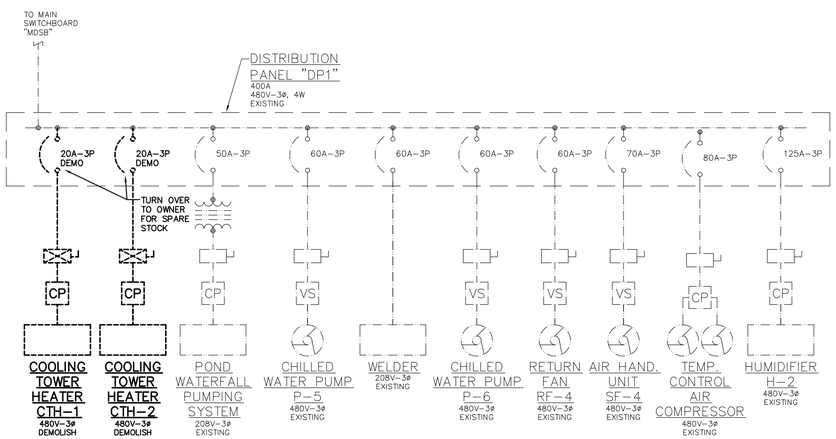
MOTOR CONTROL CENTER MCC1 – EXISTING

SCALE: NO SCALE



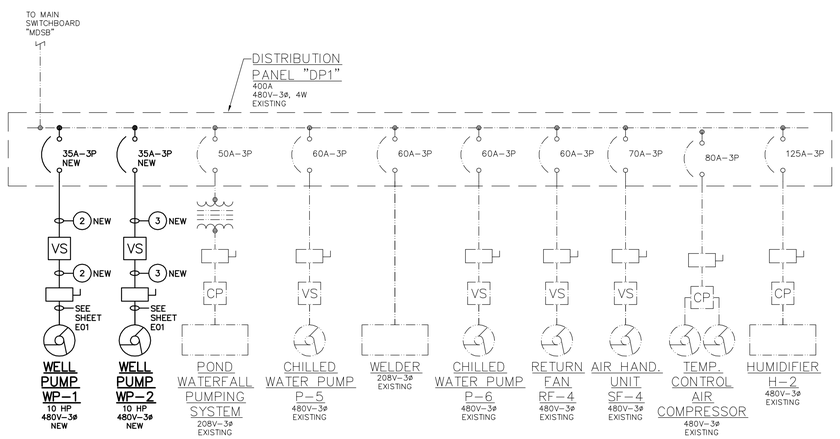
MOTOR CONTROL CENTER MCC1 – NEW

SCALE: NO SCALE



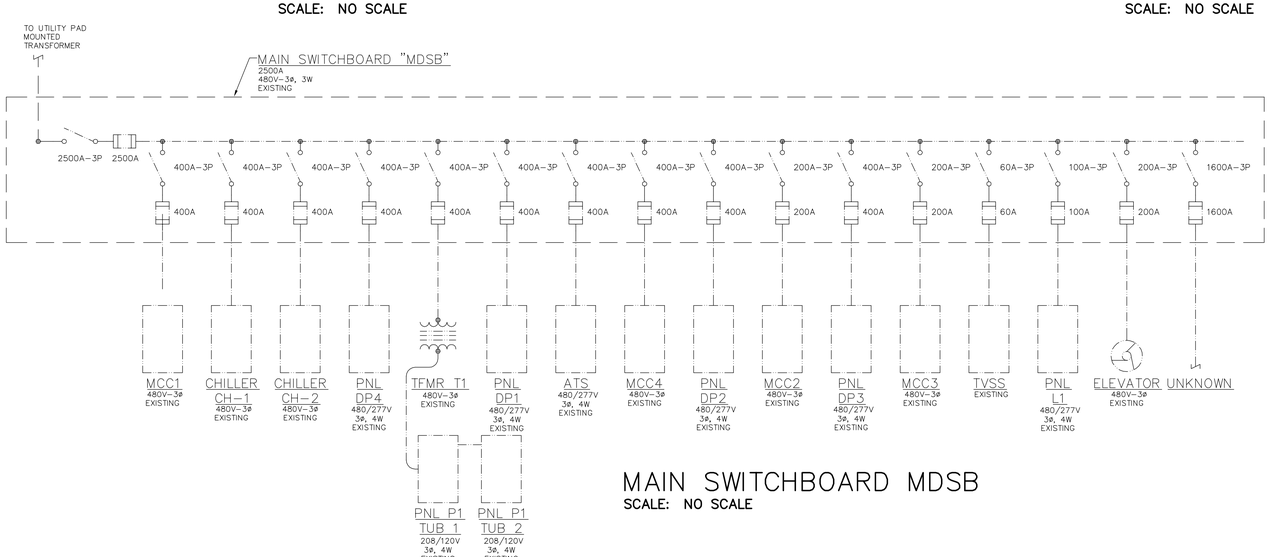
DISTRIBUTION PANEL DP1 – EXISTING

SCALE: NO SCALE



DISTRIBUTION PANEL DP1 – NEW

SCALE: NO SCALE



MAIN SWITCHBOARD MDSB

SCALE: NO SCALE

EXISTING PANEL: P1 (TUBE 2)

MAINS: 225A — VOLTAGE: 208Y/120V., 3ø, 4W.

200A MAIN CB — MOUNTING: SURFACE

REMARKS	KVA	BKR.	CIRCUIT NO. AND PHASE			BKR.	KVA	REMARKS
EF-8	1.1-M	20/1	43	A	44	20/1	0.4-L	POND LIGHTS
COMB. AIR UNIT	1.1-M	20/1	45	B	46	20/1	0.4-L	POND LIGHTS
RCP-1	0.6-M	20/1	47	C	48	20/1	0.4-L	POND LIGHTS
GWH-1	0.6-M	20/1	49	A	50	20/1	0.4-L	POND LIGHTS
CUH-1	1.5-M	20/1	51	B	52	20/1	–	SPARE
CUH-2 / EF-11	1.2-M	20/1	53	C	54	90/2	12.0-R	CAR CHARGING
EF-10	0.6-M	20/1	55	A	56			
EF-12	0.6-M	20/1	57	B	58	20/1	2.0-R	JACKET HEATER
UH-1	1.5-M	20/1	59	C	60			
COMB. AH-2	1.1-M	20/1	61	A	62	20/1	1.2-R	BATTERY HEATER
GEN BATT CHRGR	1.2-L	20/1	63	B	64	20/1	0.8-R	RECEPTS
FREON MONITOR	0.2-L	20/1	65	C	66	20/1	0.8-R	RECEPTS
MEN'S LOCKER	0.6-L	20/1	67	A	68	20/1	0.8-R	RECEPTS
MEN'S LOCKER	0.6-L	20/1	69	B	70	20/1	0.8-R	RECEPTS
CHEMICAL FEED	0.2-R	20/1	71	C	72	20/1	0.8-R	RECEPTS
MICROWAVE	1.4-R	20/1	73	A	74	20/1	0.8-R	RECEPTS
VENDING	0.2-R	20/1	75	B	76	20/1	0.8-R	RECEPTS
NON KNOWN	1.0-R	20/1	77	C	78	20/1	0.8-R	RECEPTS
* **SHED LIGHTS**	**0.06-L**	**20/1**	79	A	80	20/1	0.8-R	RECEPTS
* **SHED UNIT HTR.**	**5.0-M**	**30/2**	81	B	82	20/1	0.8-R	RECEPTS
			83	C	84	20/1	0.2-R	VENDING

LEGEND: L-LIGHTING, R-RECEPTACLES, M-MOTORS, H-HVAC REHEAT, MLO-MAIN LUGS ONLY, MB-MAIN BREAKER, GF-GROUND FAULT, AF-ARC FAULT, LC-LOCKING CLIP.

CONNECTED LOADS		DEMAND LOADS:		
LIGHTING:	**4.26** KW	@ 100%	=	**4.26** KW
RECEPTS:	**25.0** KW	@ 100% TO 10 KW + 50% REMAIN	=	**17.5** KW
MOTOR:	**14.9** KW	@ 80%	=	**12.0** KW
HVAC:	**0.0** KW	@ 65%	=	**0.0** KW
SUBTOTAL:	**44.16** KW	SUBTOTAL:	=	**33.76** KW
		DEMAND TOTAL: **33.76** KW / (208V x $\sqrt{3}$)	=	**93.8** AMPS

* INSTALL NEW CIRCUIT BREAKER IN EXISTING SPACE.

ELECTRICAL ABBREVIATIONS

AWG	AMERICAN WIRE GAUGE	LTG	LIGHTING
A	AMPERE	L/V	LOW VOLTAGE
AB	ABOVE	MDF	MAIN DISTRIBUTION FRAME
AFF	ABOVE FINISHED FLOOR	MFGR	MANUFACTURER
ARCH	ARCHITECTURAL	MAX	MAXIMUM
ATS	AUTOMATIC TRANSFER SWITCH	MECH	MECHANICAL
AUX	AUXILIARY	MIN	MINIMUM
BAS	BUILDING AUTOMATION SYSTEM	MTD	MOUNTED
BRKR	BREAKER	MTG	MOUNTING
BLDG	BUILDING	MSB	MAIN SWITCHBOARD
BTM	BOTTOM	PNL	PANEL
CLG	CEILING	P/T	POTENTIAL TRANSFORMER
℄	CENTERLINE	P.A.	PUBLIC ADDRESS
C/T	CURRENT TRANSFORMER	RECEPT	RECEPTACLE
DDC	DIRECT DIGITAL CONTROL	REQ'D	REQUIRED
DISC	DISCONNECT	RM	ROOM
DN	DOWN	SCHED	SCHEDULE
DP	DISTRIBUTION PANEL	SW	SWITCH
DWGS	DRAWINGS	SWBD	SWITCHBOARD
EA	EACH	SWGR	SWITCHGEAR
EC	ELECTRICAL CONTRACTOR	STBY	STANDBY
ELEC	ELECTRICAL	TELE	TELEPHONE
ELEV	ELEVATION/ELEVATOR	TFMR	TRANSFORMER
EXIST	EXISTING	TYP	TYPICAL
FLEX	FLEXIBLE	VS	VARIABLE SPEED DRIVE
FRAC	FRACTIONAL	W	WATTS
FURN	FURNISH	WP	WEATHERPROOF
GRD	GROUND	W/	WITH

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	MOUNTING HGT. TO CENTER UNLESS OTHERWISE NOTED
	CEILING OUTLET	
	WALL OUTLET	SEE DRAWINGS
	SPECIAL OUTLET AS REQUIRED – WALL MOUNTED	16"
	WIRED JUNCTION BOX	SEE DRAWINGS
OS	TOGGLE SWITCH – LINE VOLTAGE OCCUPANCY SENSOR	46"
	ELECTRICAL PANEL – SURFACE MOUNT, FLUSH MOUNT	6'-0" TO TOP
	MOTOR – 1 PHASE	AS REQUIRED
	MOTOR – 3 PHASE	AS REQUIRED
	SAFETY SWITCH	AS REQUIRED
	MAGNETIC MOTOR STARTER	AS REQUIRED
	COMBINATION MOTOR STARTER	AS REQUIRED
	PUSH BUTTON	46"
VS	VARIABLE SPEED SWITCH (BY OTHERS)	46"

FEEDER SCHEDULE

DESIG.	FEEDER SIZE – COPPER
1	3-12 + 12 – 3/4"
2	3-6 + 8 – 1"
3	3-8 + 8 – 1"

WIRING LEGEND

3 – 350 + 350 – 3"

NO. OF CONDUCTORS — SIZE OFCONDUCTORS — SIZE OF CONDUIT — SIZE OF GROUND CONDUCTOR

LINE TYPE LEGEND

- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
- LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO TO BE FURNISHED AND INSTALLED.

PRATER ENGINEERING ASSOCIATES, INC
CONSULTING ENGINEERS
6130 Wilcox Road
DUBLIN, OHIO 43016
PHONE: (614) 766-4183
FAX: (614) 766-2354

project title
GEOTHERMAL PROJECT
DUBLIN RECREATION CENTER
5600 POST ROAD
DUBLIN, OH 43017

sheet title
ELECTRICAL SCHEDULES

CADD#: E22-13390.DWG

project number
13390

STATE OF OHIO — GREGORY A. RILEY E-58930 — REGISTERED PROFESSIONAL ENGINEER
10/08/2014

drawn	GRM
design	GRM
checked	GAR

issued for	date
BID	11/24/14

sheet
E22