

ADDENDUM NO. 1

TO: PLANS AND SPECIFICATIONS FOR STATE OF MISSOURI

**Water & Wastewater Improvements
Graham Cave State Park
Danville, Missouri
Project No. X2321-01**

Bid Opening Date: 1:30 PM, Tuesday, October 15, 2024 (Not Changed)

Bidders are hereby informed that the construction Plans and/or Specifications are modified as follows:

SPECIFICATION CHANGES:

1. None

DRAWING CHANGES:

1. Sheet G-002
 - a. Note added showing location on site where effluent disposal is permitted.
 - b. See attached revised drawing.
2. Sheet D-101
 - a. REVISE Key Note C to show that 1,800 cubic feet per acre of effluent disposal is permitted.
 - b. See attached revised drawing.
3. Sheet D-103
 - a. REVISE Key Note C to show that 1,800 cubic feet per acre of effluent disposal is permitted.
 - b. See attached revised drawing.
4. Sheet D-104
 - a. Modify electrical wiring note to show coordination required with electric company and removal length modified.
 - b. Key Note D modified to show electrical wiring requirements and coordination required with park staff for fuel tank relocation.
 - c. Pictorial exhibit added to show electrical connections to tankage.
 - d. Sheet title updated.
 - e. See attached revised drawing.
5. Sheet C-201
 - a. Note added to show septic tank waste monitoring and pump-out requirements during construction.
 - b. Key note H modified to clarify requirements for zone check valve.
 - c. See attached revised drawing.
6. Sheet C-203
 - a. Note added to show septic tank waste monitoring and pump-out requirements during construction.
 - b. Key note H modified to clarify requirements for zone check valve.
 - c. See attached revised drawing.

7. Sheet C-204
 - a. Fuel tank pad dimensions adjusted.
 - b. Conduit path from well house to fuel tanks shown.
 - c. Key note C amended to clarify rock removal and frost requirements.
 - d. Key note F modified to allow for concrete patching in lieu of asphalt patch option.
 - e. Key note I added to show requirements for new PVC sewer piping installation.
 - f. Key note J added to show bollard protection required at well head. Plan view amended to show three bollards to protect well head.
 - g. See attached revised drawing.
8. Sheet C-205
 - a. Key note C amended to show rock chipping requirements and trench excavation requirements.
 - b. Arrow note added showing connection between old and new piping at Pavilion area.
 - c. See attached revised drawing.
9. Sheet E-101
 - a. Key Note U added to show backflow device required.
 - b. Location of Key Note J valve relocated adjacent to backflow device.
 - c. Key Note D amended to show copper piping.
 - d. Well logs added for contractor reference to determine length of wiring for pumps.
 - e. See attached revised drawing.
10. Sheet E-102
 - a. Circuit added for fuel pumps.
 - b. Riser diagram amended to show fuel pump circuit and conduit and wiring from panel to fuel tank.
 - c. See attached revised drawing.

GENERAL COMMENTS:

1. The Pre-Bid Meeting was held on October 3, 2024 at 10:00 AM. The Pre-Bid Meeting sign-in sheet is attached.
2. Please contact Mandy Roberson, Contract Specialist, at 573-522-0074 or Mandy.Roberson@oa.mo.gov for questions about bidding procedures, MBE/WBE/SDVE Goals, and other submittal requirements.
3. The deadline for technical questions is October 7, 2024 at 12:00 PM.
4. Changes to, or clarification of, the bid documents are only made as issued in the addenda.
5. All correspondence with respect to this project must include the State of Missouri project number as indicated above.
6. Current Plan holders list available online at:
<https://www.oafmdcplanroom.com/projects/2619/plan-holders/x2321-01-water-wastewater-improvements-graham-cave-state-park>
7. Prospective Bidders contact American Document Solutions, 1400 Forum Blvd Suite 1C, Columbia MO 65201, 573-446-7768 to order official plans and specifications.
8. **All bids shall be submitted on the bid form without additional terms and conditions, modifications, or stipulations. Each space on the bid form shall be properly filled. Failure to do so will result in rejection of the bid.**
9. **MBE/WBE/SDVE participation requirements can be found in DIVISION 00. The MBE/WBE/SDVE participation goals are 0%/0%/3%, respectively. Only certified firms as**

of the bid opening date can be used to satisfy the MBE/WBE/SDVE participation goals for this project. If a bidder is unable to meet a participation goal, a Good Faith Effort Determination Form must be completed. Failure to complete this process will result in rejection of the bid.

ATTACHMENTS:

1. Pre-Bid Meeting Sign-In Sheet
2. Sheet G-002
3. Sheet D-101
4. Sheet D-103
5. Sheet D-104
6. Sheet C-201
7. Sheet C-203
8. Sheet C-204
9. Sheet C-205
10. Sheet E-101
11. Sheet E-102

October 9, 2024

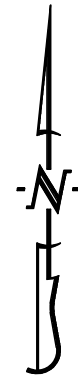
END OF ADDENDUM NO. 1

Water and Wastewater Improvements
 Graham Cave State Park
 Danville, MO

Project No. X2321-01
 October 3, 2024

Name & Title	Company Name	Phone	E-Mail Address
Eric Hibdon	OA FMDC	573-522-0322	Eric.Hibdon@oa.mo.gov
Darrin Shoemaker	Shuco Construction	573-544-5924	darrinshoemaker1970@gmail.com
David. Mason	Brown and Root	573-257-0336	david.mason@brownandroot.com
Mike Jordan	Heggemann, Inc.	636-456-8524	mike@heggemanninc.com
Jesse Stephens	Crockett Engineering	573-991-7327	jstephens@crockettengineering.com
Ken Shepatis	OA FMDC	417-576-7161	Kenneth.Shepatis@OA.mo.gov
NATHAN GRASSLE	STATE PARKS	573-751-5360	NATHAN.GRASSLE@DNR.MO.GOV
Anthony Oratio	State Parks Graham Cave	573-220-2474	ANTHONY.ORTATIO@DNR.MO.GOV
Chris Adams	State Parks Graham Cave	573-301-5732	Christopher.Adams@DNR.mo.gov
Matt Harris	State Parks Graham Cave	573-564-3476	Matthew.harris@DNR.MO.GOV
Dustin Wible	State Parks	573-417-7322	dustin.wible@dnr.mo.gov

LOCATES:
 MISSOURI ONE CALL INC.
 1022 B NORTHEAST DRIVE
 JEFFERSON CITY, MO 65109
 1-800-344-7483



SCALE: 1"=160'
 0 80 160 320

TELEPHONE:
 AT&T
 2210 HIGHWAY K
 O'FALLON, MO 63368
 314-420-1973

ELECTRIC:
 CONSOLIDATED ELECTRIC CO-OP
 3940 E. LIBERTY STREET
 MEXICO, MO 65265
 573-581-3630

CONTROL POINTS:

CP 1241 - PK NAIL IN ASPHALT NEAR PARK OFFICE

- NORTHING = 1120782.21
- EASTING = 1903066.32
- ELEVATION = 758.39

CP 2582 - PK NAIL IN ASPHALT NEAR CAMPGROUND

- NORTHING = 1121694.31
- EASTING = 1901803.51
- ELEVATION = 755.47

CP 3260 - PK NAIL IN ASPHALT NEAR PAVILLION/PLAYGROUND

- NORTHING = 1119025.31
- EASTING = 1903197.92
- ELEVATION = 580.48

LEGEND OF SYMBOLS:

- EXISTING CURB
- PROPOSED CURB
- RIP RAP
- EXISTING STRUCTURE
- EXISTING TREELINE
- PROPOSED TREELINE
- EDGE OF WATERWAY
- EXISTING WATERLINE
- PROPOSED WATERLINE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND CABLE TELEVISION
- EXISTING HIGH VOLTAGE ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELEC. & TV
- EXISTING OVERHEAD ELEC., TV & TELE.
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- 100 YEAR FLOOD PLAIN
- FLOODWAY
- ORDINARY HIGH WATER MARK
- STREAM SIDE BUFFER
- OUTER STREAM BUFFER
- EXISTING SIGNS
- EXISTING POWER POLE
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING GAS METER
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- MANHOLE
- EXISTING SANITARY SEWER LATERAL
- PROPOSED SANITARY SEWER LATERAL
- PROPOSED TRACER WIRE TEST STATION BOX
- EXISTING AIR CONDITIONER
- EXISTING TELEPHONE PEDESTAL
- EXISTING ELECTRICAL TRANSFORMER
- EXISTING ELECTRIC METER
- EXISTING LIGHT POLE
- EXISTING GUY WIRE

GENERAL CAMPGROUND WORK AREA. REFER TO THE FOLLOWING PLAN SHEETS FOR WORK IN THIS AREA:

- 1) D-101 SEWER DEMOLITION PLAN - CAMPGROUND
- 2) D-102 WELL HOUSE DEMOLITION PLAN - CAMPGROUND
- 3) C-101 SEWER GRADING PLAN - CAMPGROUND
- 4) C-201 SEWER DRIP IRRIGATION PLAN - CAMPGROUND
- 5) C-202 WELL HOUSE SITE PLAN - CAMPGROUND
- 6) C-301 DRIP IRRIGATION DETAILS
- 7) C-302 SITE CONSTRUCTION DETAILS
- 8) S-101 WELL HOUSE CODE REQUIREMENTS
- 9) S-102 WELL HOUSE BUILDING PLAN & ELEVATIONS
- 10) S-103 WELL HOUSE STRUCTURAL DETAILS
- 11) E-101 WELL HOUSE EQUIPMENT PLAN
- 12) E-102 WELL HOUSE ELECTRICAL PLAN

NOTE: CAMPGROUND WATER IS REQUIRED TO BE FUNCTIONAL FROM APRIL 1ST THROUGH NOVEMBER 1ST. WORK THAT SHUTS DOWN THE WELL HOUSE MUST BE COMPLETED BETWEEN NOVEMBER 1ST AND APRIL 1ST. SEWER TANKS SHOULD BE INSTALLED NO LATER THAN APRIL 1ST. IF THE SYSTEM IS NOT COMPLETE AND TURNED OVER BY APRIL 1ST, THE CONTRACTOR SHALL PUMP AND HAUL SEPTIC WASTE AS NEEDED TO A PERMITTED TREATMENT FACILITY UNTIL SYSTEM IS FULLY FUNCTIONAL.

NOTE: IN CONSULTATION WITH PARK STAFF THE SHADED 12.5 ACRE NATIVE GRASS AREA MAY BE USED AS AN EFFLUENT DISPOSAL AREA WITH A MOBILE TANK TRUNK AND SPRAYER. EFFLUENT APPLICATION RATE MAY NOT EXCEED 0.5" PER SQUARE FEET PER DAY OR NO MORE THAN 1,800 CUBIC FEET PER ACRE PER DAY. (13,500 GALLONS PER ACRE PER DAY)

PARK OFFICE SEWER WORK AREA. REFER TO THE FOLLOWING PLAN SHEETS FOR WORK IN THIS AREA:

- 1) D-103 SEWER DEMOLITION - PARK OFFICE
- 2) C-101 SEWER GRADING PLAN - PARK OFFICE
- 3) C-203 DRIP IRRIGATION PLAN - PARK OFFICE
- 4) C-300 DRIP IRRIGATION DETAILS
- 5) C-301 SITE CONSTRUCTION DETAILS

NOTE: THE EXISTING LAGOON SHALL NOT BE DECOMMISSIONED PRIOR TO INSTALLATION OF THE SEPTIC TANK. THE CONTRACTOR SHALL PROVIDE PERIODIC PUMP-OUT OF THE TANK AND HAUL-OFF TO A PERMITTED FACILITY WHILE THE NEW DRIP IRRIGATION FIELD IS UNDER CONSTRUCTION.

PARK OFFICE WELL HOUSE WORK AREA. REFER TO THE FOLLOWING PLAN SHEETS FOR WORK IN THIS AREA:

- 1) D-104 WELL HOUSE DEMOLITION - PARK OFFICE
- 2) C-204 PARK OFFICE WELL HOUSE SITE PLAN
- 3) C-301 SITE CONSTRUCTION DETAILS
- 4) S-101 WELL HOUSE CODE REQUIREMENTS
- 5) S-102 WELL HOUSE BUILDING PLAN & ELEVATIONS
- 6) S-103 WELL HOUSE STRUCTURAL DETAILS
- 7) E-101 WELL HOUSE EQUIPMENT PLAN
- 8) E-102 WELL HOUSE ELECTRICAL PLAN

NOTE: PARK OFFICE WATER IS REQUIRED TO BE LEFT ON AS LONG AS FEASIBLE. THE NEW WELL HOUSE SHOULD BE CONSTRUCTED PRIOR TO DEMOLITION OF THE EXISTING WELL HOUSE. THE PUMP AND WELL HEAD SHOULD BE MODIFIED AND CONNECTED TO THE NEW FACILITY AS QUICKLY AS POSSIBLE, AND IN COORDINATION WITH THE PARK STAFF.

PLAYGROUND AND PAVILLION WORK AREA. REFER TO THE FOLLOWING PLAN SHEETS FOR WORK IN THIS AREA:

- 1) D-105 PAVILLION/PLAYGROUND DEMOLITION PLAN
- 2) C-205 PAVILLION/PLAYGROUND WATER PLAN
- 3) C-201 SITE CONSTRUCTION DETAILS

BOAT DOCK AREA. NO WORK IN THIS LOCATION

LOUTRE RIVER

HIGHWAY TT

STATE OF MISSOURI
 MICHAEL L. PARSON,
 GOVERNOR



JESSE RAY STEPHENS
 MO LICENSE - 200000868

SITE/CIVIL ENGINEER:
CROCKETT

ENGINEERING CONSULTANTS
 1000 W. N. King Blvd., Bldg. 1
 Columbia, Missouri 65203
 (573) 447-0292

www.crockettengineering.com
 Crockett Engineering Consultants, LLC
 Missouri Certificate of Authority
 #20015101

OFFICE OF ADMINISTRATION
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 MANAGEMENT,
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730 TRUMAN BUILDING
 301 WEST HIGH STREET
 POST OFFICE BOX 809
 JEFFERSON CITY, MO 65102

IMPROVEMENTS TO WATER
 AND WASTEWATER SYSTEM
 MULTIPLE ASSETS

GRAHAM CAVE STATE PARK
 217 HIGHWAY TT
 DANVILLE, MO 63361

PROJECT # X2321-01

REVISION: ADD. #1
 DATE: 10-8-2024
 REVISION: _____
 DATE: _____
 REVISION: _____
 DATE: _____
 ISSUE DATE: 09/09/2024

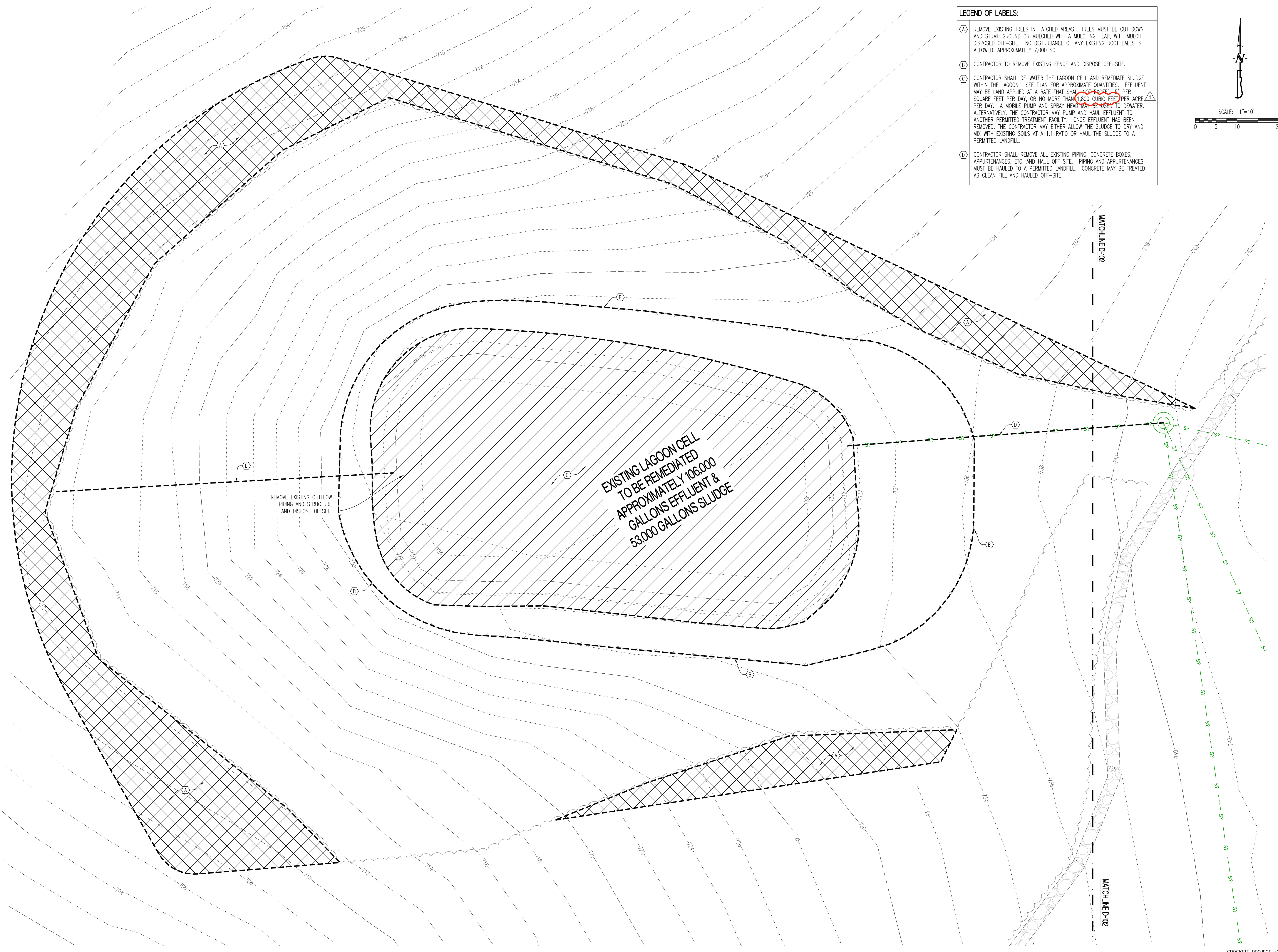
CAD DWG FILE: 230188 - GRAHAM CIVIL
 DRAWN BY: JRS
 CHECKED BY: ATG
 DESIGNED BY: JRS

SHEET TITLE:
 SITE LOCATION &
 CONTROL PLAN

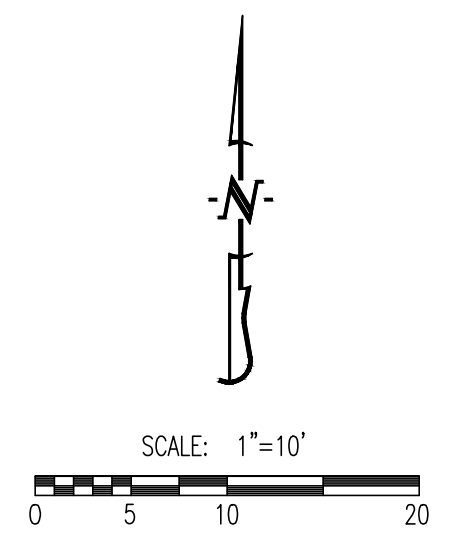
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G-002

SHEET 2 OF 21



- LEGEND OF LABELS:**
- (A) REMOVE EXISTING TREES IN HATCHED AREAS. TREES MUST BE CUT DOWN AND STUMP GROUND OR MULCHED WITH A MULCHING HEAD, WITH MULCH DISPOSED OFF-SITE. NO DISTURBANCE OF ANY EXISTING ROOT BALLS IS ALLOWED. APPROXIMATELY 7,000 SOFT.
 - (B) CONTRACTOR TO REMOVE EXISTING FENCE AND DISPOSE OFF-SITE.
 - (C) CONTRACTOR SHALL DE-WATER THE LAGOON CELL AND REMEDIATE SLUDGE WITHIN THE LAGOON. SEE PLAN FOR APPROXIMATE QUANTITIES. EFFLUENT MAY BE LAND APPLIED AT A RATE THAT SHALL NOT EXCEED 5 PER SQUARE FEET PER DAY, OR NO MORE THAN 1,800 CUBIC FEET PER ACRE PER DAY. A MOBILE PUMP AND SPRAY HEAD MAY BE USED TO DEWATER. ALTERNATIVELY, THE CONTRACTOR MAY PUMP AND HAUL EFFLUENT TO ANOTHER PERMITTED TREATMENT FACILITY. ONCE EFFLUENT HAS BEEN REMOVED, THE CONTRACTOR MAY EITHER ALLOW THE SLUDGE TO DRY AND MIX WITH EXISTING SOILS AT A 1:1 RATIO OR HAUL THE SLUDGE TO A PERMITTED LANDFILL.
 - (D) CONTRACTOR SHALL REMOVE ALL EXISTING PIPING, CONCRETE BOXES, APPURTENANCES, ETC. AND HAUL OFF SITE. PIPING AND APPURTENANCES MUST BE HAULED TO A PERMITTED LANDFILL. CONCRETE MAY BE TREATED AS CLEAN FILL AND HAULED OFF-SITE.



STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



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MULTIPLE ASSETS

GRAHAM CAVE STATE PARK
217 HIGHWAY TT
DANVILLE, MO 63361

PROJECT # X2321-01

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CAD DWG FILE: 230188_GRAHAM CIVIL
DRAWN BY: JRS
CHECKED BY: ATG
DESIGNED BY: JRS

SHEET TITLE:

SEWER DEMOLITION
PLAN - CAMPGROUND

SHEET NUMBER:

D-101



- LEGEND OF LABELS:**
- (A) REMOVE EXISTING TREES IN HATCHED AREAS. TREES MUST BE CUT DOWN AND STUMP GROUND OR MULCHED WITH A MULCHING HEAD, WITH MULCH DISPOSED OFF-SITE. NO DISTURBANCE OF ANY EXISTING ROOT BALLS IS ALLOWED. APPROXIMATELY 17,000 SQFT.
 - (B) CONTRACTOR TO REMOVE EXISTING FENCE AND DISPOSE OFF-SITE.
 - (C) CONTRACTOR SHALL DE-WATER THE LAGOON CELL AND REMEDIATE SLUDGE WITHIN THE LAGOON. SEE PLAN FOR APPROXIMATE QUANTITIES. EFFLUENT MAY BE LAND APPLIED AT A RATE THAT SHALL NOT EXCEED 800 CUBIC FEET PER ACRE PER DAY, OR NO MORE THAN 800 CUBIC FEET PER ACRE PER DAY. A MOBILE PUMP AND SPRAY HEAD MAY BE USED TO DEWATER. ALTERNATIVELY, THE CONTRACTOR MAY PUMP AND HAUL EFFLUENT TO ANOTHER PERMITTED TREATMENT FACILITY. ONCE EFFLUENT HAS BEEN REMOVED, THE CONTRACTOR MAY EITHER ALLOW THE SLUDGE TO DRY AND MIX WITH EXISTING SOILS AT A 1:1 RATIO OR HAUL THE SLUDGE TO A PERMITTED LANDFILL.
 - (D) CONTRACTOR SHALL REMOVE ALL EXISTING PIPING, CONCRETE BOXES, APPURTENANCES, ETC. AND HAUL OFF SITE. PIPING AND APPURTENANCES MUST BE HAULED TO A PERMITTED LANDFILL. CONCRETE MAY BE TREATED AS CLEAN FILL AND HAULED OFF-SITE.
 - (E) DISCONNECT AND REMOVE EXISTING ELECTRICAL SERVICE CONDUIT AND WIRING BACK TO OVERHEAD POLE.

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



JESSE RAY STEPHENS
MO LICENSE - 200000968

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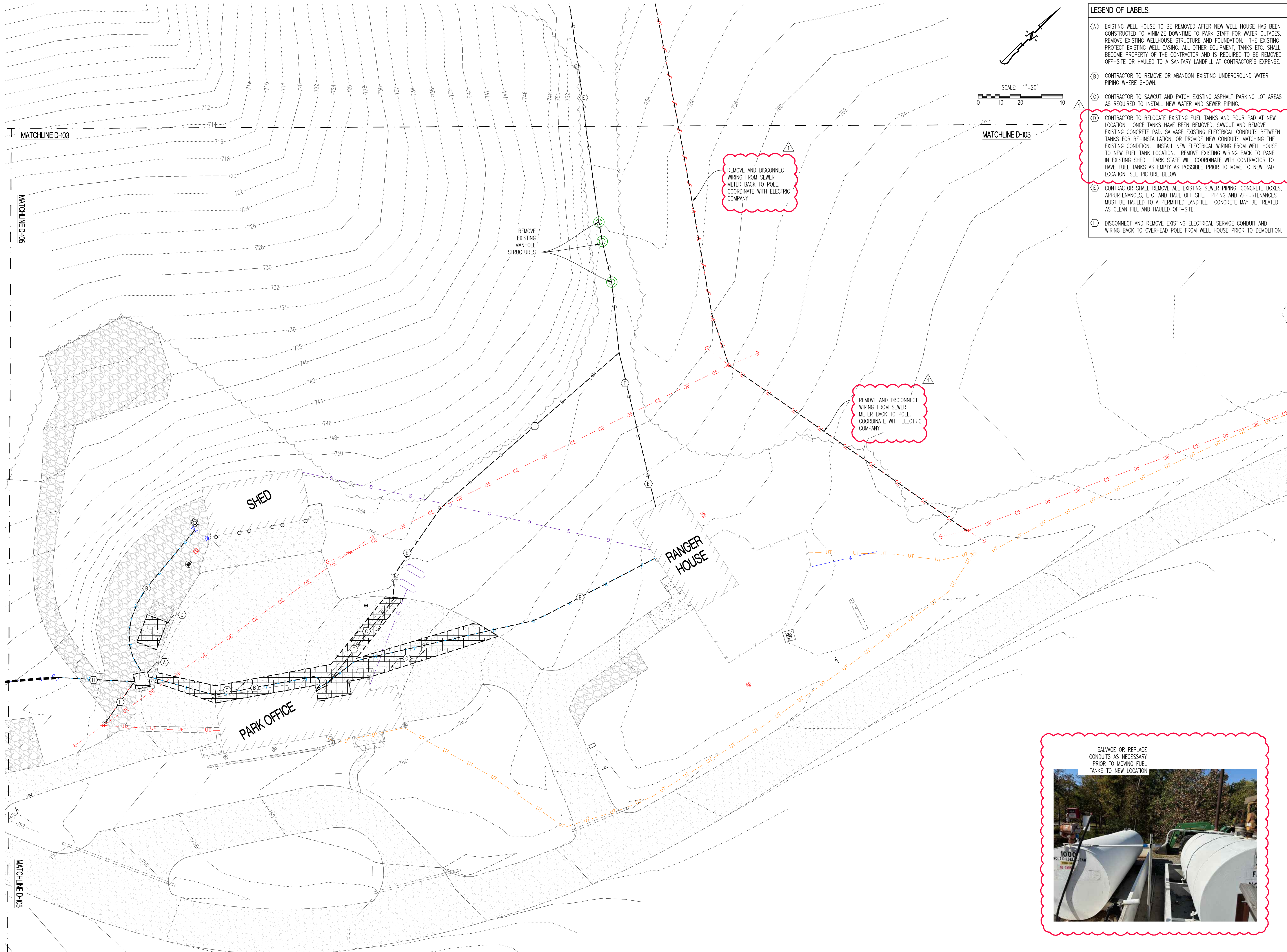
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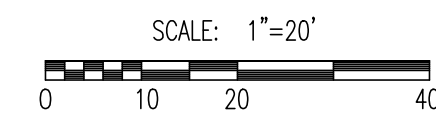
SEWER DEMOLITION
PLAN - PARK OFFICE

SHEET NUMBER:

D-103



- LEGEND OF LABELS:**
- (A) EXISTING WELL HOUSE TO BE REMOVED AFTER NEW WELL HOUSE HAS BEEN CONSTRUCTED TO MINIMIZE DOWNTIME TO PARK STAFF FOR WATER OUTAGES. REMOVE EXISTING WELLHOUSE STRUCTURE AND FOUNDATION. THE EXISTING PROTECT EXISTING WELL CASING. ALL OTHER EQUIPMENT, TANKS ETC. SHALL BECOME PROPERTY OF THE CONTRACTOR AND IS REQUIRED TO BE REMOVED OFF-SITE OR HAULED TO A SANITARY LANDFILL AT CONTRACTOR'S EXPENSE.
 - (B) CONTRACTOR TO REMOVE OR ABANDON EXISTING UNDERGROUND WATER PIPING WHERE SHOWN.
 - (C) CONTRACTOR TO SAWCUT AND PATCH EXISTING ASPHALT PARKING LOT AREAS AS REQUIRED TO INSTALL NEW WATER AND SEWER PIPING.
 - (D) CONTRACTOR TO RELOCATE EXISTING FUEL TANKS AND POUR PAD AT NEW LOCATION. ONCE TANKS HAVE BEEN REMOVED, SAWCUT AND REMOVE EXISTING CONCRETE PAD. SALVAGE EXISTING ELECTRICAL CONDUITS BETWEEN TANKS FOR RE-INSTALLATION, OR PROVIDE NEW CONDUITS MATCHING THE EXISTING CONDITION. INSTALL NEW ELECTRICAL WIRING FROM WELL HOUSE TO NEW FUEL TANK LOCATION. REMOVE EXISTING WIRING BACK TO PANEL IN EXISTING SHED. PARK STAFF WILL COORDINATE WITH CONTRACTOR TO HAVE FUEL TANKS AS EMPTY AS POSSIBLE PRIOR TO MOVE TO NEW PAD LOCATION. SEE PICTURE BELOW.
 - (E) CONTRACTOR SHALL REMOVE ALL EXISTING SEWER PIPING, CONCRETE BOXES, APPURTENANCES, ETC. AND HAUL OFF SITE. PIPING AND APPURTENANCES MUST BE HAULED TO A PERMITTED LANDFILL. CONCRETE MAY BE TREATED AS CLEAN FILL AND HAULED OFF-SITE.
 - (F) DISCONNECT AND REMOVE EXISTING ELECTRICAL SERVICE CONDUIT AND WIRING BACK TO OVERHEAD POLE FROM WELL HOUSE PRIOR TO DEMOLITION.



REMOVE AND DISCONNECT WIRING FROM SEWER METER BACK TO POLE. COORDINATE WITH ELECTRIC COMPANY

REMOVE AND DISCONNECT WIRING FROM SEWER METER BACK TO POLE. COORDINATE WITH ELECTRIC COMPANY



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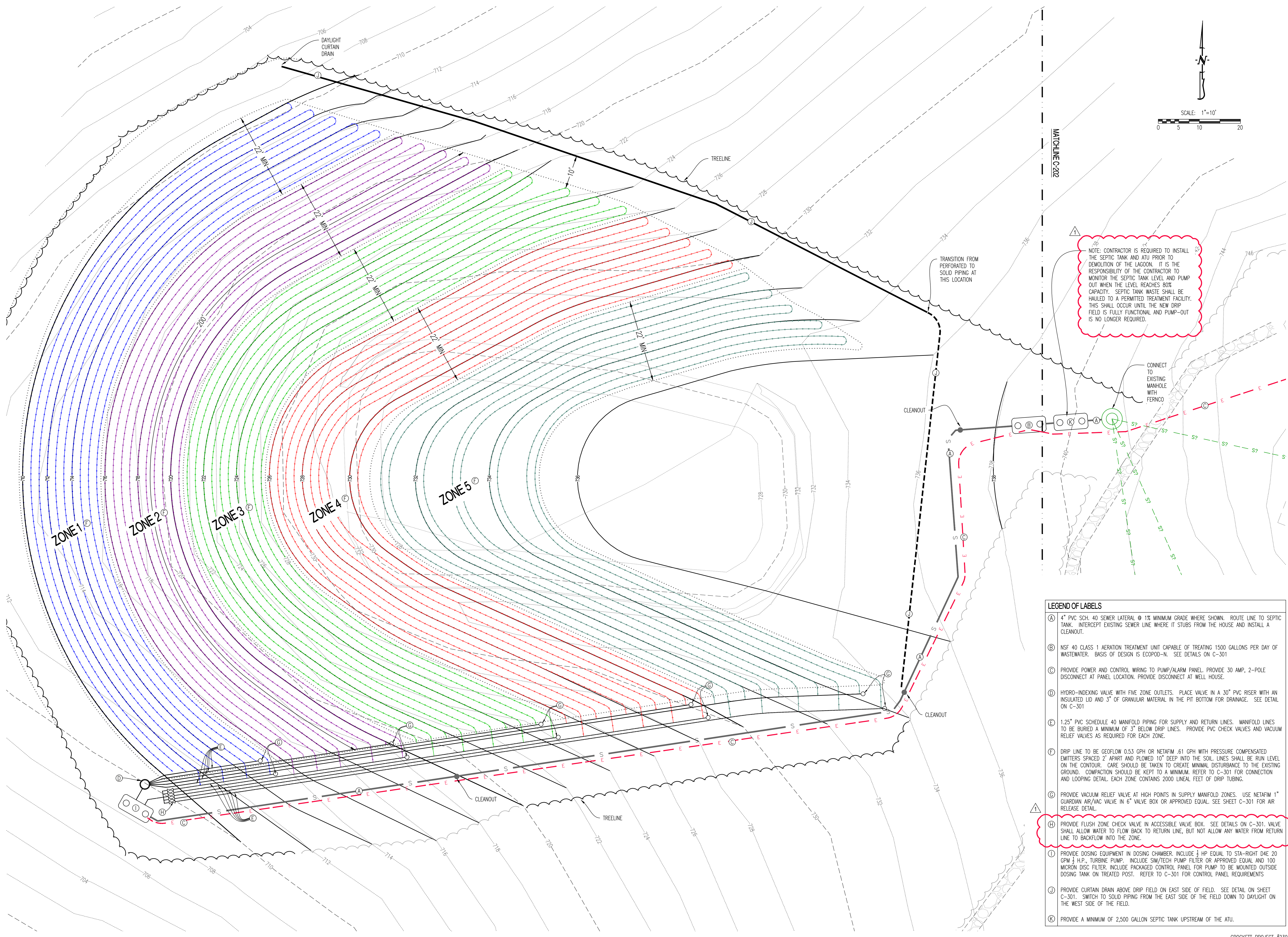
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DRAWN BY: JRS
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DESIGNED BY: JRS

SHEET TITLE:
SEWER DEMOLITION
PLAN - PARK OFFICE

SHEET NUMBER:

D-104



NOTE: CONTRACTOR IS REQUIRED TO INSTALL THE SEPTIC TANK AND ATU PRIOR TO DEMOLITION OF THE LAGOON. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MONITOR THE SEPTIC TANK LEVEL AND PUMP OUT WHEN THE LEVEL REACHES 80% CAPACITY. SEPTIC TANK WASTE SHALL BE HAULED TO A PERMITTED TREATMENT FACILITY. THIS SHALL OCCUR UNTIL THE NEW DRIP FIELD IS FULLY FUNCTIONAL AND PUMP-OUT IS NO LONGER REQUIRED.

- LEGEND OF LABELS**
- (A) 4" PVC SCH. 40 SEWER LATERAL @ 1% MINIMUM GRADE WHERE SHOWN. ROUTE LINE TO SEPTIC TANK. INTERCEPT EXISTING SEWER LINE WHERE IT STUBS FROM THE HOUSE AND INSTALL A CLEANOUT.
 - (B) NSF 40 CLASS 1 AERATION TREATMENT UNIT CAPABLE OF TREATING 1500 GALLONS PER DAY OF WASTEWATER. BASIS OF DESIGN IS ECOPOD-N. SEE DETAILS ON C-301
 - (C) PROVIDE POWER AND CONTROL WIRING TO PUMP/ALARM PANEL. PROVIDE 30 AMP, 2-POLE DISCONNECT AT PANEL LOCATION. PROVIDE DISCONNECT AT WELL HOUSE.
 - (D) HYDRO-INDEXING VALVE WITH FIVE ZONE OUTLETS. PLACE VALVE IN A 30" PVC RISER WITH AN INSULATED LID AND 3" OF GRANULAR MATERIAL IN THE PIT BOTTOM FOR DRAINAGE. SEE DETAIL ON C-301
 - (E) 1.25" PVC SCHEDULE 40 MANIFOLD PIPING FOR SUPPLY AND RETURN LINES. MANIFOLD LINES TO BE BURIED A MINIMUM OF 3" BELOW DRIP LINES. PROVIDE PVC CHECK VALVES AND VACUUM RELIEF VALVES AS REQUIRED FOR EACH ZONE.
 - (F) DRIP LINE TO BE GEOWEAVE 0.53 GPH OR NETAFIM .61 GPH WITH PRESSURE COMPENSATED EMITTERS SPACED 2' APART AND PLOWED 10" DEEP INTO THE SOIL. LINES SHALL BE RUN LEVEL ON THE CONTOUR. CARE SHOULD BE TAKEN TO CREATE MINIMAL DISTURBANCE TO THE EXISTING GROUND. COMPACTION SHOULD BE KEPT TO A MINIMUM. REFER TO C-301 FOR CONNECTION AND LOOPING DETAIL. EACH ZONE CONTAINS 2000 LINEAL FEET OF DRIP TUBING.
 - (G) PROVIDE VACUUM RELIEF VALVE AT HIGH POINTS IN SUPPLY MANIFOLD ZONES. USE NETAFIM 1" GUARDIAN AIR/VAC VALVE IN 6" VALVE BOX OR APPROVED EQUAL. SEE SHEET C-301 FOR AIR RELEASE DETAIL.
 - (H) PROVIDE FLUSH ZONE CHECK VALVE IN ACCESSIBLE VALVE BOX. SEE DETAILS ON C-301. VALVE SHALL ALLOW WATER TO FLOW BACK TO RETURN LINE, BUT NOT ALLOW ANY WATER FROM RETURN LINE TO BACKFLOW INTO THE ZONE.
 - (I) PROVIDE DOSING EQUIPMENT IN DOSING CHAMBER. INCLUDE 1/2 HP EQUAL TO STA-RIGHT D4E 20 GPM 1/2 H.P., TURBINE PUMP. INCLUDE SIM/TECH PUMP FILTER OR APPROVED EQUAL AND 100 MICRON DISC FILTER. INCLUDE PACKAGED CONTROL PANEL FOR PUMP TO BE MOUNTED OUTSIDE DOSING TANK ON TREATED POST. REFER TO C-301 FOR CONTROL PANEL REQUIREMENTS
 - (J) PROVIDE CURTAIN DRAIN ABOVE DRIP FIELD ON EAST SIDE OF FIELD. SEE DETAIL ON SHEET C-301. SWITCH TO SOLID PIPING FROM THE EAST SIDE OF THE FIELD DOWN TO DAYLIGHT ON THE WEST SIDE OF THE FIELD.
 - (K) PROVIDE A MINIMUM OF 2,500 GALLON SEPTIC TANK UPSTREAM OF THE ATU.

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR



JESSE RAY STEPHENS
MO LICENSE # 200000968
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730 TRUMAN BUILDING
301 WEST HIGH STREET
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IMPROVEMENTS TO WATER
AND WASTEWATER SYSTEM
MULTIPLE ASSETS

GRAHAM CAVE STATE PARK
217 HIGHWAY TT
DANVILLE, MO 63361

PROJECT # X2321-01

REVISION: ADD. #1
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CAD DWG FILE: 230188_GRAHAM CIVIL
DRAWN BY: JRS
CHECKED BY: ATG
DESIGNED BY: JRS

SHEET TITLE:
**SEWER DRIP
IRRIGATION PLAN -
CAMPGROUND**

SHEET NUMBER:

C-201



JESSE RAY STEPHENS
MO LICENSE - 200000968

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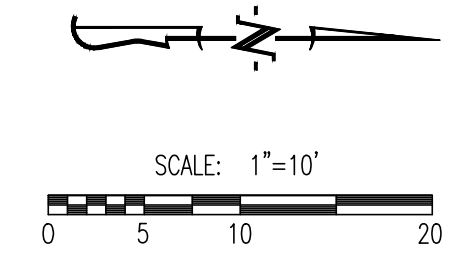
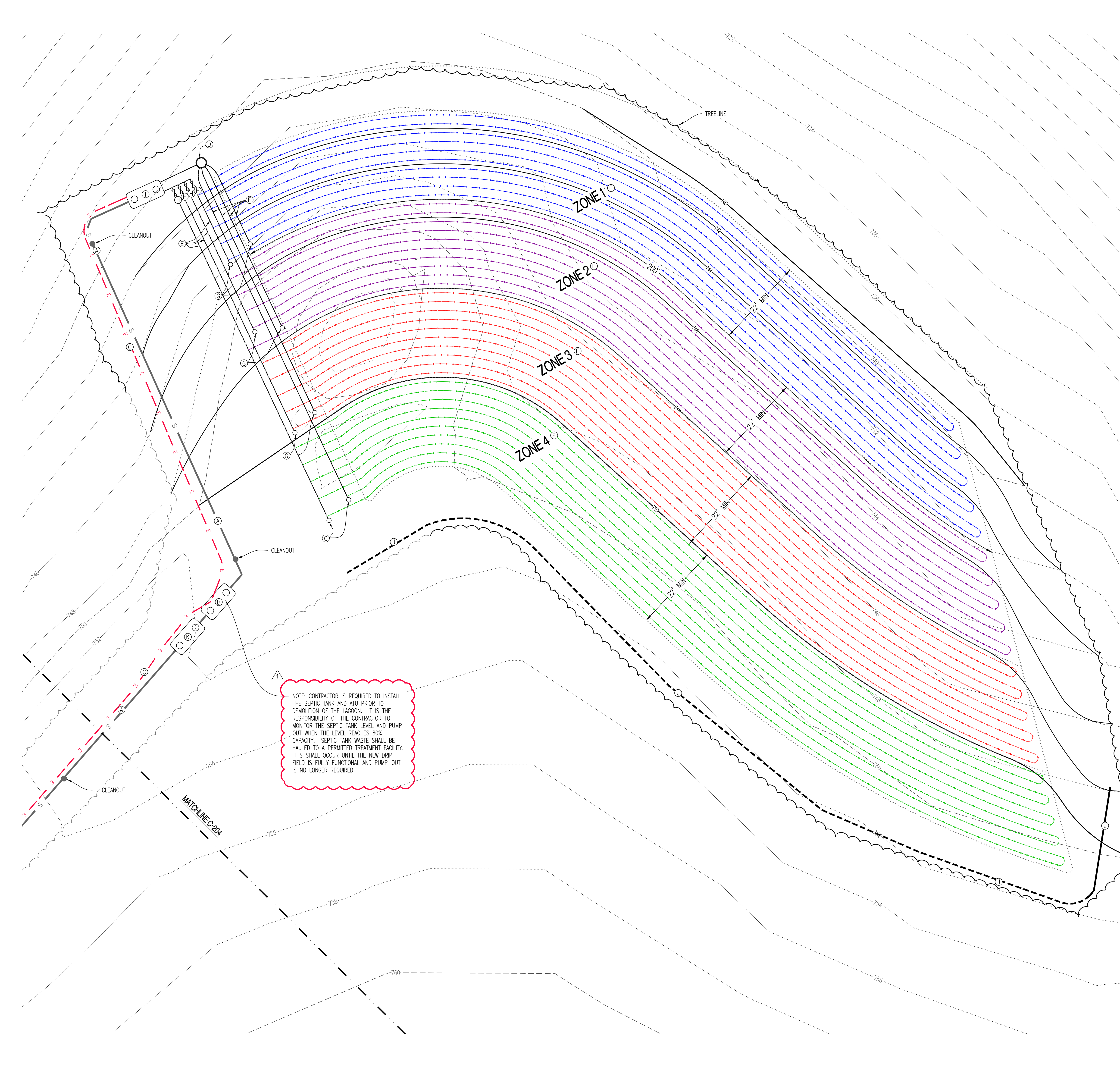
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SEWER DRIP
IRRIGATION PLAN -
PARK OFFICE

SHEET NUMBER:

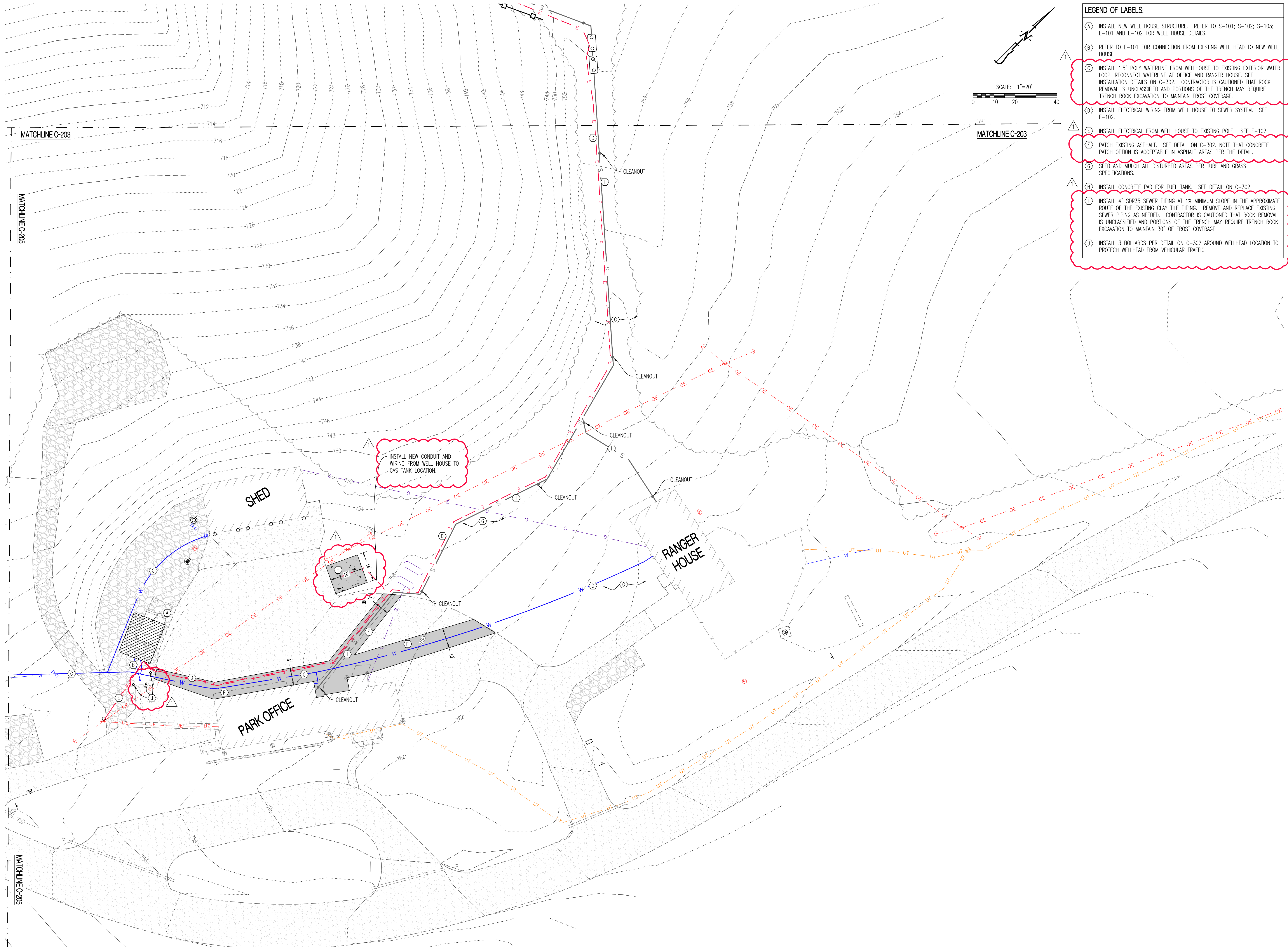
C-203

SHEET 12 OF 21



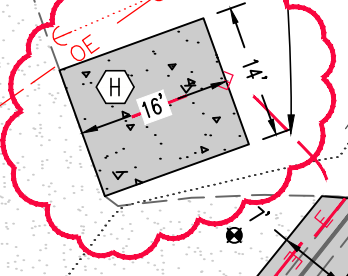
NOTE: CONTRACTOR IS REQUIRED TO INSTALL THE SEPTIC TANK AND ATU PRIOR TO DEMOLITION OF THE LAGOON. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MONITOR THE SEPTIC TANK LEVEL AND PUMP OUT WHEN THE LEVEL REACHES 80% CAPACITY. SEPTIC TANK WASTE SHALL BE HAULED TO A PERMITTED TREATMENT FACILITY. THIS SHALL OCCUR UNTIL THE NEW DRIP FIELD IS FULLY FUNCTIONAL AND PUMP-OUT IS NO LONGER REQUIRED.

- LEGEND OF LABELS**
- (A) 4" PVC SCH. 40 SEWER LATERAL @ 1% MINIMUM GRADE WHERE SHOWN. ROUTE LINE TO SEPTIC TANK. INTERCEPT EXISTING SEWER LINE WHERE IT STUBS FROM THE HOUSE AND INSTALL A CLEANOUT.
 - (B) NSF 40 CLASS 1 AERATION TREATMENT UNIT CAPABLE OF TREATING 1000 GALLONS PER DAY OF WASTEWATER. BASIS OF DESIGN IS ECOPOD-N. SEE DETAILS ON C-301
 - (C) PROVIDE POWER AND CONTROL WIRING TO PUMP/ALARM PANEL. PROVIDE 30 AMP, 2-POLE DISCONNECT AT PANEL LOCATION. PROVIDE DISCONNECT AT WELL HOUSE.
 - (D) HYDRO-INDEXING VALVE WITH FOUR ZONE OUTLETS. PLACE VALVE IN A 30" PVC RISER WITH AN INSULATED LID AND 3" OF GRANULAR MATERIAL IN THE PIT BOTTOM FOR DRAINAGE. SEE DETAIL ON C-301
 - (E) 1.25" PVC SCHEDULE 40 MANIFOLD PIPING FOR SUPPLY AND RETURN LINES. MANIFOLD LINES TO BE BURIED A MINIMUM OF 3" BELOW DRIP LINES. PROVIDE PVC CHECK VALVES AND VACUUM RELIEF VALVES AS REQUIRED FOR EACH ZONE.
 - (F) DRIP LINE TO BE GEOWELL 0.53 GPH OR NETAFIM .61 GPH WITH PRESSURE COMPENSATED EMITTERS SPACED 2' APART AND PLOWED 10" DEEP INTO THE SOIL. LINES SHALL BE RUN LEVEL ON THE CONTOUR. CARE SHOULD BE TAKEN TO CREATE MINIMAL DISTURBANCE TO THE EXISTING GROUND. COMPACTION SHOULD BE KEPT TO A MINIMUM. REFER TO C-301 FOR CONNECTION AND LOOPING DETAIL. EACH ZONE CONTAINS 2000 LINEAL FEET OF DRIP TUBING.
 - (G) PROVIDE VACUUM RELIEF VALVE AT HIGH POINTS IN SUPPLY MANIFOLD ZONES. USE NETAFIM 1" GUARDIAN AIR/VAC VALVE IN 6" VALVE BOX OR APPROVED EQUAL. SEE SHEET C-301 FOR AIR RELEASE DETAIL.
 - (H) PROVIDE FLUSH ZONE CHECK VALVE IN ACCESSIBLE VALVE BOX. SEE DETAILS ON C-301. VALVE SHALL ALLOW WATER TO FLOW BACK TO RETURN LINE, BUT NOT ALLOW ANY WATER FROM RETURN LINE TO BACKFLOW INTO THE ZONE.
 - (I) PROVIDE DOSING EQUIPMENT IN DOSING CHAMBER. INCLUDE 1/2 HP EQUAL TO STA-RIGHT D4E 20 GPM 1/2 H.P., TURBINE PUMP. INCLUDE SIM/TECH PUMP FILTER OR APPROVED EQUAL AND 100 MICRON DISC FILTER. INCLUDE PACKAGED CONTROL PANEL FOR PUMP TO BE MOUNTED OUTSIDE DOSING TANK ON TREATED POST. REFER TO C-301 FOR CONTROL PANEL REQUIREMENTS
 - (J) PROVIDE CURTAIN DRAIN ABOVE DRIP FIELD ON EAST SIDE OF FIELD. SEE DETAIL ON SHEET C-301. SWITCH TO SOLID PIPING FROM THE EAST SIDE OF THE FIELD DOWN TO DAYLIGHT ON THE NORTH SIDE OF THE FIELD.
 - (K) PROVIDE A MINIMUM OF 2,500 GALLON SEPTIC TANK UPSTREAM OF THE ATU.



- LEGEND OF LABELS:**
- (A) INSTALL NEW WELL HOUSE STRUCTURE. REFER TO S-101; S-102; S-103; E-101 AND E-102 FOR WELL HOUSE DETAILS.
 - (B) REFER TO E-101 FOR CONNECTION FROM EXISTING WELL HEAD TO NEW WELL HOUSE
 - (C) INSTALL 1.5" POLY WATERLINE FROM WELLHOUSE TO EXISTING EXTERIOR WATER LOOP. RECONNECT WATERLINE AT OFFICE AND RANGER HOUSE. SEE INSTALLATION DETAILS ON C-302. CONTRACTOR IS CAUTIONED THAT ROCK REMOVAL IS UNCLASSIFIED AND PORTIONS OF THE TRENCH MAY REQUIRE TRENCH ROCK EXCAVATION TO MAINTAIN FROST COVERAGE.
 - (D) INSTALL ELECTRICAL WIRING FROM WELL HOUSE TO SEWER SYSTEM. SEE E-102.
 - (E) INSTALL ELECTRICAL FROM WELL HOUSE TO EXISTING POLE. SEE E-102
 - (F) PATCH EXISTING ASPHALT. SEE DETAIL ON C-302. NOTE THAT CONCRETE PATCH OPTION IS ACCEPTABLE IN ASPHALT AREAS PER THE DETAIL.
 - (G) SEED AND MULCH ALL DISTURBED AREAS PER TURF AND GRASS SPECIFICATIONS.
 - (H) INSTALL CONCRETE PAD FOR FUEL TANK. SEE DETAIL ON C-302.
 - (I) INSTALL 4" SDR35 SEWER PIPING AT 1% MINIMUM SLOPE IN THE APPROXIMATE ROUTE OF THE EXISTING CLAY TILE PIPING. REMOVE AND REPLACE EXISTING SEWER PIPING AS NEEDED. CONTRACTOR IS CAUTIONED THAT ROCK REMOVAL IS UNCLASSIFIED AND PORTIONS OF THE TRENCH MAY REQUIRE TRENCH ROCK EXCAVATION TO MAINTAIN 30" OF FROST COVERAGE.
 - (J) INSTALL 3 BOLLARDS PER DETAIL ON C-302 AROUND WELLHEAD LOCATION TO PROTECT WELLHEAD FROM VEHICULAR TRAFFIC.

INSTALL NEW CONDUIT AND WIRING FROM WELL HOUSE TO GAS TANK LOCATION.



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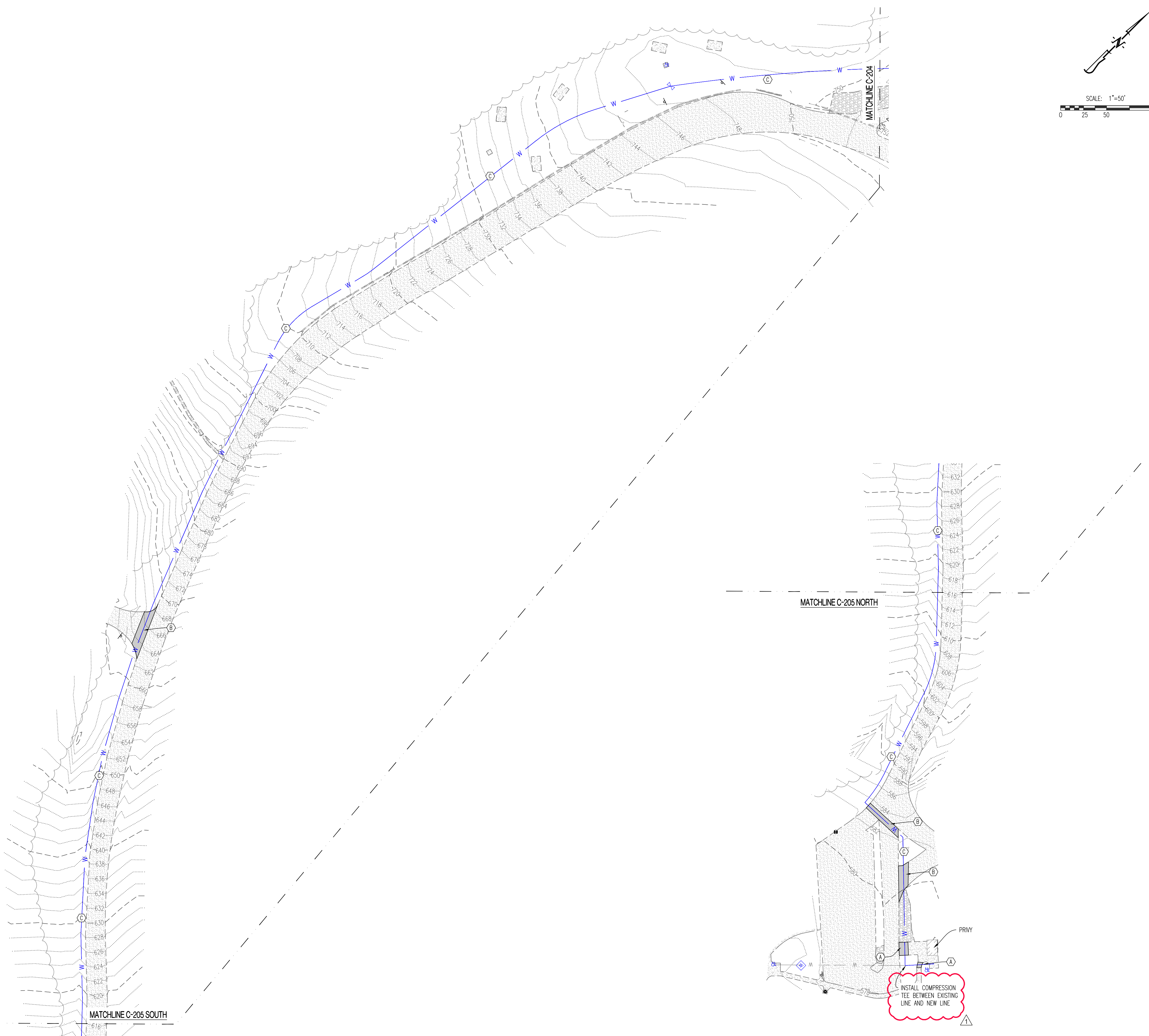
CAD DWG FILE: 230188_GRAHAM CIVIL
DRAWN BY: JRS
CHECKED BY: ATG
DESIGNED BY: JRS

SHEET TITLE:

WELL HOUSE SITE
PLAN - PARK OFFICE

SHEET NUMBER:

C-204



LEGEND OF LABELS:

- (A) CONTRACTOR TO SAWCUT AND PATCH EXISTING CONCRETE SIDEWALK AREAS AS REQUIRED TO INSTALL NEW WATER PIPING. SEE DETAIL ON C-302
- (B) CONTRACTOR TO SAWCUT AND PATCH EXISTING ASPHALT PARKING LOT AREAS AS REQUIRED TO INSTALL NEW WATER PIPING. SEE DETAIL ON C-302
- (C) INSTALL NEW 1.5" POLY WATERLINE FROM WELL HOUSE TO PAVILION. NOTE THAT THE EXCAVATION IS UNCLASSIFIED AND TRENCH ROCK EXCAVATION SHOULD BE ANTICIPATED BY THE CONTRACTOR. ANY CHIPPED ROCK MUST BE DISPOSED OFF-SITE. WATERLINE MUST BE BURIED BELOW THE FROST LINE PER DETAIL ON C-302. MINOR ADJUSTMENTS IN THE ALIGNMENT THAT DO NOT RESULT IN TREE REMOVAL ARE ACCEPTABLE.

STATE OF MISSOURI
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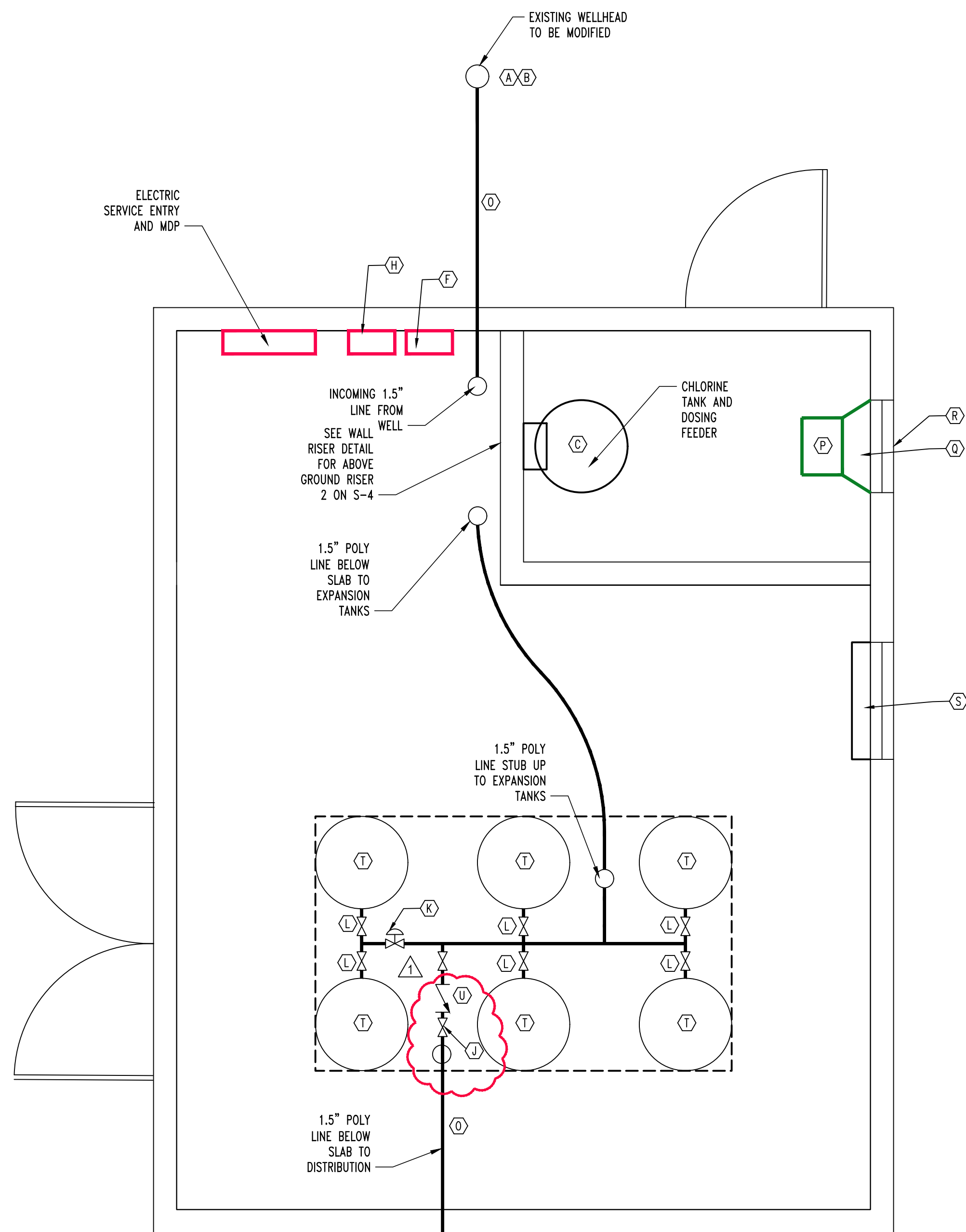
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SHEET TITLE:

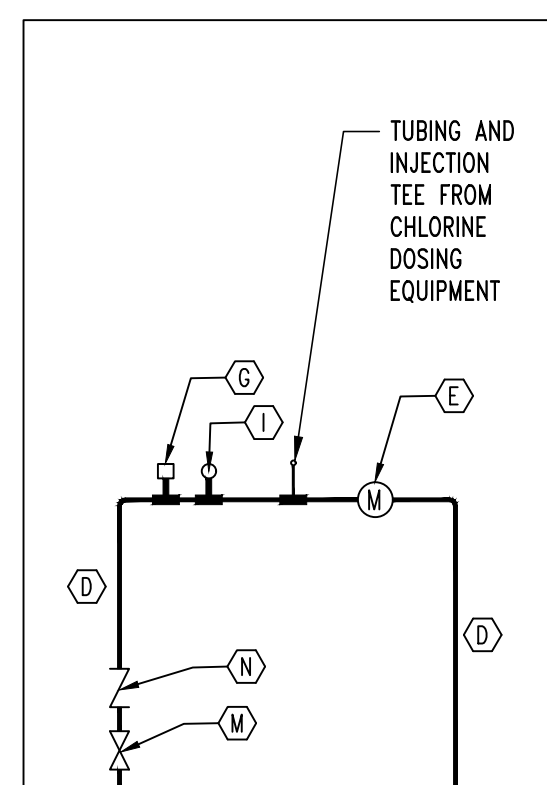
PAVILION/PLAYGROUND
WATER PLAN

SHEET NUMBER:

C-205



1
E-1
WELLHOUSE EQUIPMENT PLAN
SCALE: 1/2" = 1'-0"



2
E-1
WELLHOUSE WALL RISER
SCALE: 1/2" = 1'-0"

Graham Cave State Park Office	
Well/Intake Data - PWSS No. 6122671 Montgomery County, Sheet 1 of 1	
Well Number	W1
Local Well Name	Well #1, Office
Well ID #	11669
DGLS ID #	0023558
Status	Active
Latitude	38.907650
Longitude	-91.577430
12-Digit Hydrologic Unit	10300200204
County	Montgomery
MoDNR Region	St. Louis
Groundwater Province	Northeast Missouri
Source Aquifer(s)	Ozark
Confined/Unconfined	Unconfined
Regional Drilling Area	Area 1
Date Drilled (year)	1965
Material (C/U)	Consolidated
Casing Base Formation	Powell Dol.
Total Depth Formation	Cotter Dol.
Total Depth	450
Ground Elevation (ft)	745
Casing Depth (ft)	200
Casing Size (in)	6
Casing Type	Steel
Elev. of Casing Top (ft)	745
Screen Length (ft)	
Screen Size (in)	
Static Water Level (ft)	195
Well Yield (gpm)	30
Head (ft)	141
Draw Down (ft)	
Pump Depth (ft)	336
Pump Capacity (gpm)	19
Surface Drainage	
State Approved (Y/N)	
Liquefaction Risk	Low
Landslide Risk	Low
Collapse Risk	Low
Flood Risk	Low
Surface Contamination Risk	Moderate
Conduit Flow Risk	K1

Graham Cave State Park Campground	
Well/Intake Data - PWSS No. 6120155 Montgomery County, Sheet 1 of 1	
Well Number	W2
Local Well Name	Well #2, Campground
Well ID #	11669
DGLS ID #	0024329
Status	Active
Latitude	38.910310
Longitude	-91.581920
12-Digit Hydrologic Unit	10300200204
County	Montgomery
MoDNR Region	St. Louis
Groundwater Province	Northeast Missouri
Source Aquifer(s)	Ozark
Confined/Unconfined	Unconfined
Regional Drilling Area	Area 1
Date Drilled (year)	1966
Material (C/U)	Consolidated
Casing Base Formation	Powell Dol.
Total Depth Formation	Cotter Dol.
Total Depth	470
Ground Elevation (ft)	756
Casing Depth (ft)	220
Casing Size (in)	6
Casing Type	Steel
Elev. of Casing Top (ft)	756
Screen Length (ft)	
Screen Size (in)	
Static Water Level (ft)	177
Well Yield (gpm)	120
Head (ft)	
Draw Down (ft)	
Pump Depth (ft)	
Pump Capacity (gpm)	
Surface Drainage	
State Approved (Y/N)	
Liquefaction Risk	Low
Landslide Risk	Low
Collapse Risk	Low
Flood Risk	Low
Surface Contamination Risk	Moderate
Conduit Flow Risk	K1

LEGEND OF LABELS:

- (A) EXTEND EXISTING WELL CASING ABOVE GRADE AND PROVIDE AND INSTALL A WATER TIGHT WELL CAP WITH WELL SEAL. ALSO PROVIDE A PITLESS ADAPTER BELOW GRADE BELOW THE FROST LINE AT A MINIMUM OF 4' DEEP. PITLESS ADAPTER BY BAKER OR APPROVED EQUAL. PITLESS ADAPTER SHALL BE BRASS.
- (B) INSTALL NEW 3 HORSEPOWER FRANKLIN TRI-SEAL PUMP OR APPROVED EQUAL. PUMP SHALL PUMP 25 GALLONS PER MINUTE AND OPERATE AT 230 VOLTS. BASIS OF DESIGN IS FRANKLIN 93822530-25FA3S4-PE. ANY SUBSTITUTIONS SHALL BE APPROVED BY THE ENGINEER IN WRITING. NEW PUMP IS REQUIRED AT THE OFFICE WELLHOUSE. PROVIDE NEW CHECK VALVE AND TORQUE ARRESTOR DIRECTLY ABOVE THE PUMP. THE EXISTING 5 HORSEPOWER FRANKLIN TRI-SEAL PUMP AT THE CAMPGROUND MAY REMAIN. EXTEND AND PROVIDE NEW WIRING AS REQUIRED TO CONNECT TO NEW WELLHOUSE.
- (C) PROVIDE AND INSTALL NEW PROPORTIONAL FEED WELL WATER CHLORINATOR EQUAL TO J-PRO-22 AS MANUFACTURED BY CLEAN WATER SYSTEMS OR APPROVED EQUAL. SYSTEM SHALL INCLUDE A MINIMUM OF A 35 GALLON TANK FOR STORING LIQUID CHLORINE. SYSTEM SHALL BE CAPABLE OF CHLORINATING FOR FLOWS OF UP TO 50 GALLONS PER MINUTE. ROUTE CHEMICAL FEED TUBING THROUGH WALL AND INSTALL SCHEDULE 80 INJECTION TEE.
- (D) PROVIDE 1.5" COPPER PIPING INSIDE BUILDING PRESSURE RATED AT 200 PSL. PROVIDE WALL SUPPORTS AND STANDOFFS AT A MINIMUM OF 3" ON CENTER. PROVIDE FLOOR STAND-OFFS A MINIMUM OF 3" ON CENTER.
- (E) INSTALL WATER METER EQUAL TO BADGER RECORDALL METER OR APPROVED EQUAL. BASIS OF DESIGN IS BADGER 70-BRONZE.
- (F) CONTRACTOR TO PROVIDE NEMA 4 DISCONNECT FOR WELL PUMP. MOUNT ADJACENT TO PUMP CONTROLLER.
- (G) CONTRACTOR TO INSTALL PRESSURE SWITCH. CONNECT PRESSURE SWITCH TO WATERLINE AND ROUTE CONTROL WIRING TO THE PUMP CONTROLLER. PRESSURE SWITCH SHALL BE EQUAL TO SQUARE-D HIGH PRESSURE SWITCH TYPE G-HEAVY DUTY 50 / 70 PSI.
- (H) INSTALL PUMP SAVER CONTROL PANEL. EQUIPMENT SHALL BE EQUAL TO FRANKLIN ELECTRIC PUMPTEC-PLUS PUMP PROTECTOR. IT SHALL BE RATED FOR PUMPS FROM 0.5 HP UP TO 5 HP. BASIS OF DESIGN IS FRANKLIN PUMPTEC-PLUS MODEL 5800060100. PROVIDE LIGHTNING ARRESTOR.
- (I) PROVIDE WATER PRESSURE GAUGE IN-LINE RATED UP TO 200 PSI.
- (J) INSTALL BALL VALVE AND GARDEN HOSE CONNECTION FOR SYSTEM BLEED-DOWN. FITTINGS SHALL BE BRASS WITH MALE ADAPTERS. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY.
- (K) INSTALL PRESSURE RELIEF VALVE RATED AT 100 PSL. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY. FITTINGS SHALL BE BRASS WITH MALE ADAPTERS. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY.
- (L) INSTALL TEE AND BALL VALVE FROM WATERLINE TO EXPANSION TANKS. FITTINGS SHALL BE BRASS WITH MALE ADAPTERS. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY.
- (M) PROVIDE BALL VALVE AT ENTRANCE TO BUILDING AND EXIT FROM BUILDING. FITTINGS SHALL BE BRASS WITH MALE ADAPTERS. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY.
- (N) INSTALL CHECK VALVE. FITTINGS SHALL BE BRASS WITH MALE ADAPTERS. PVC ADAPTERS SHALL BE FEMALE ADAPTERS ONLY.
- (O) PROVIDE 1.5" DIAMETER POLYETHYLENE PIPING FROM NEW WELL HOUSE TO EXTERIOR DISTRIBUTION SYSTEM. PROVIDE BRASS COMPRESSION COUPLINGS AT PIPING TRANSITIONS.
- (P) 800 CFM INLINE EXHAUST FAN EQUAL TO SOLER AND PALAU TO SERIES WITH BACKDRAFT DAMPER. FLOW RATED AT 8" STATIC. EXHAUST FAN TO BE CONNECTED TO SWITCH ADJACENT TO DOOR.
- (Q) INSTALL TRANSITIONAL DUCTWORK BETWEEN EXHAUST FAN AND LOUVER.
- (R) LOUVER SHALL BE 18"X18" EQUAL TO POTTORFF EFD-445 OR APPROVED EQUAL. THIS SHALL BE MOUNTED A MINIMUM OF 72" ABOVE FINISHED FLOOR.
- (S) INSTALL PTAC HVAC UNIT THROUGH-WALL. UNIT SHALL BE EQUAL TO AMANA DCP 153A50AA AND HAVE INTEGRAL 5KW HEATER AND 15,000 BTU AIR CONDITIONING CAPACITY. FLASH AND CAULK AROUND UNIT FOR AIR-TIGHT SEAL.
- (T) INSTALL FLEXCON PRO-LITE PRESSURE TANK OR APPROVED EQUAL. BASIS OF DESIGN IS FLEXCON CSS-120. EACH WELL HOUSE SHALL HAVE 6 EXPANSION TANKS FLOOR MOUNTED.
- (U) PROVIDE DOUBLE CHECK BACKFLOW ASSEMBLY PRIOR TO BUILDING EXIT. BACKFLOW DEVICE SHALL BE EQUAL TO WATTS 007 SERIES FOR 1.5" PIPING.

GENERAL NOTES

1. THE EXISTING WELLHOUSE AT THE PARK OFFICE SHALL REMAIN FUNCTION UP UNTIL THE POINT THE NEW WELL HOUSE IS COMPLETE.
2. ONCE THE NEW WELL HOUSE IS COMPLETE, DEMOLISH THE EXISTING WELL HOUSE AND MODIFY THE WELLHEAD AS SHOWN ON THIS PLAN AND MAKE ALL FINAL CONNECTIONS TO NEW WELL HOUSE AND DISTRIBUTION SYSTEM.

NOTE: WELL LOGS PROVIDED FOR CONTRACTOR REFERENCE.



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SHEET TITLE:

WELL HOUSE
EQUIPMENT PLAN

SHEET NUMBER:



JESSE RAY STEPHENS
MO LICENSE #200000868

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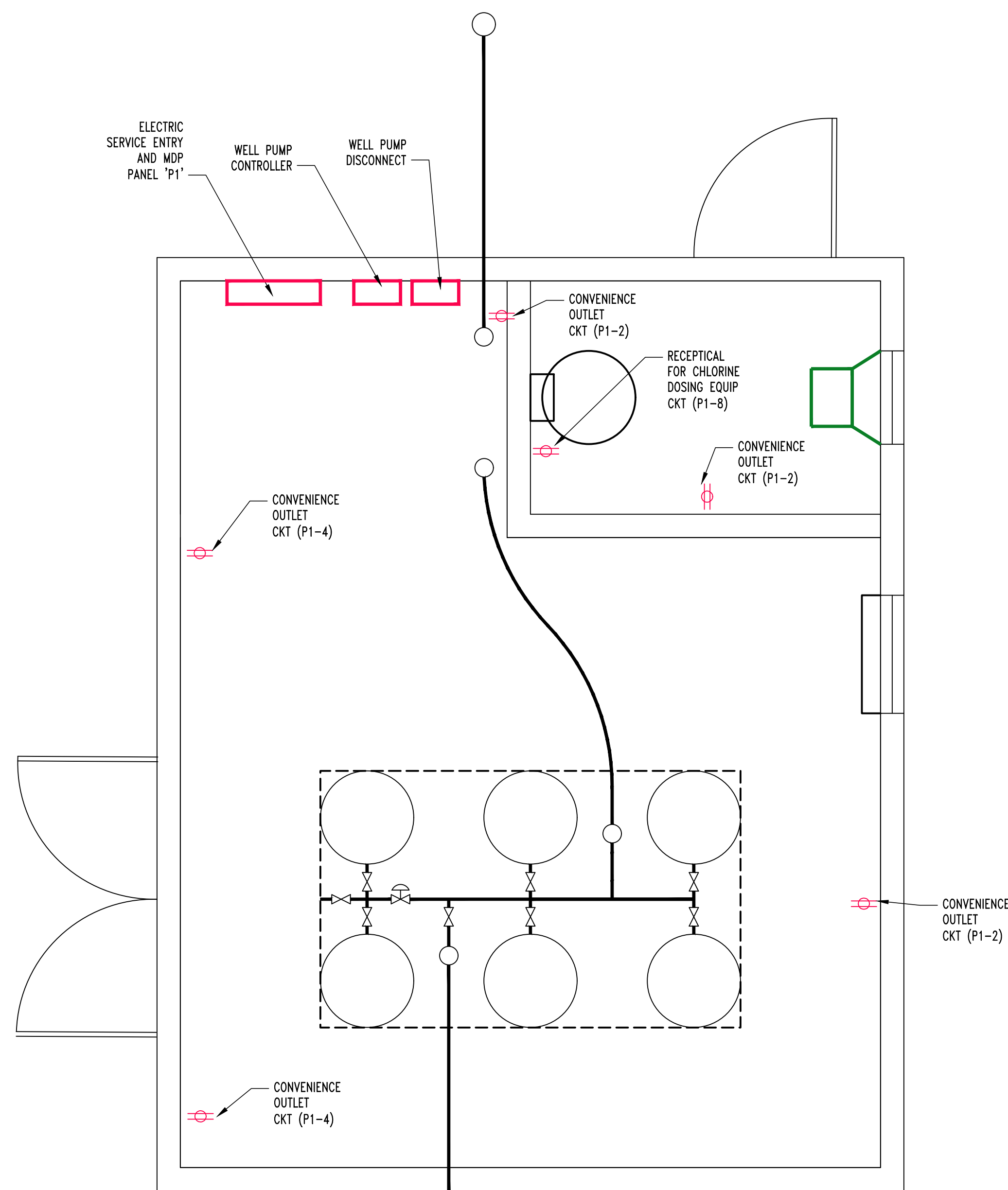
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ELECTRICAL PLAN

SHEET NUMBER:

E-102

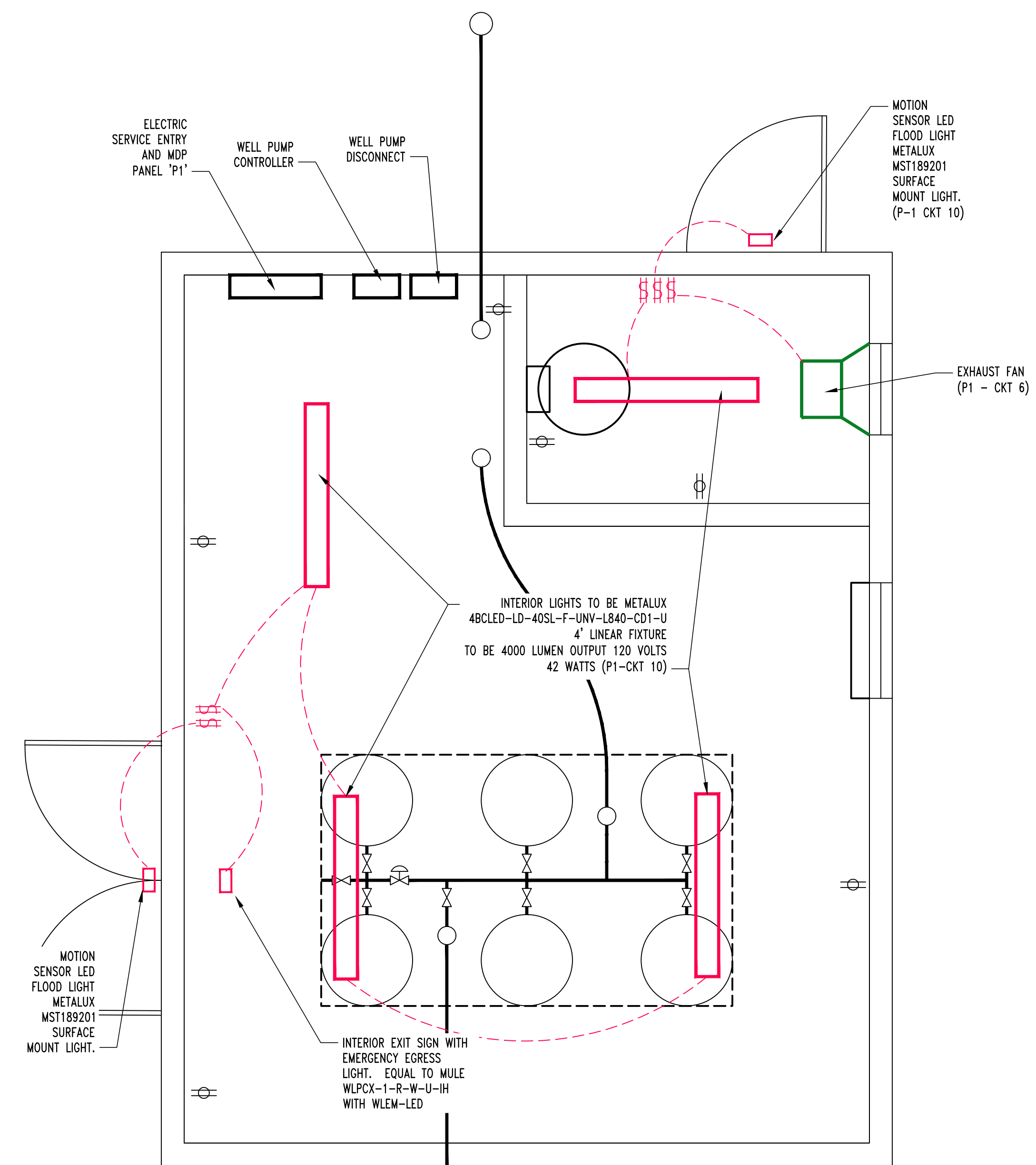
SHEET 21 OF 21



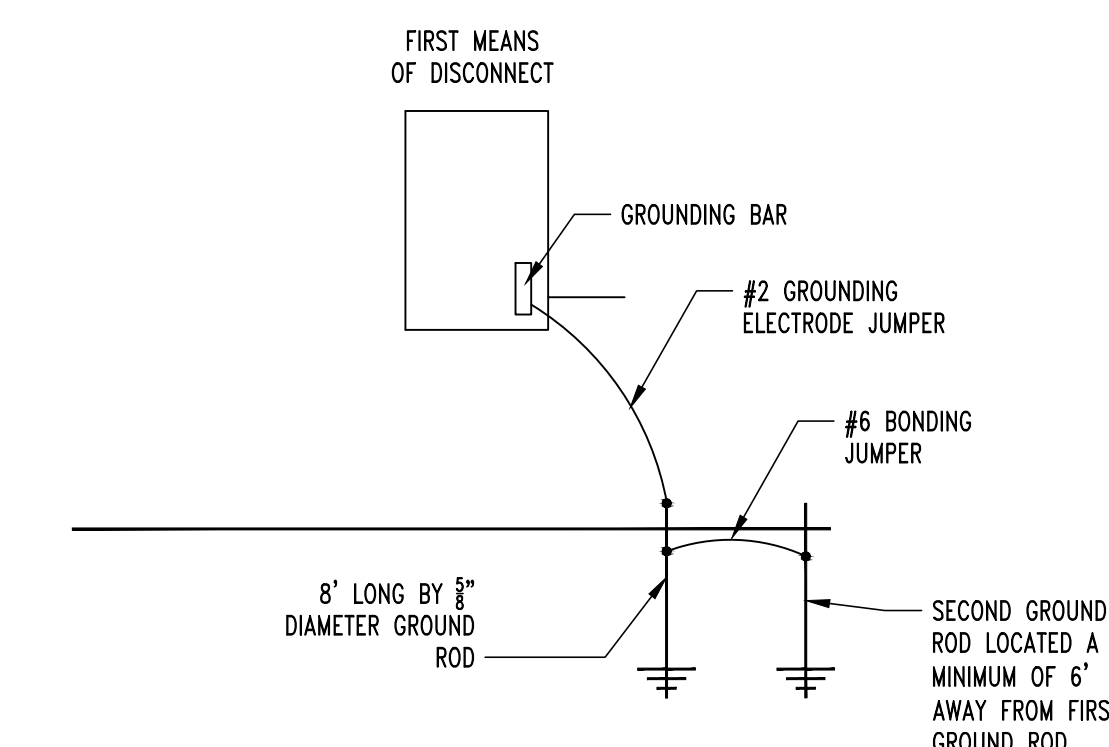
PANEL 'P1' SCHEDULE											
VOLTAGE		PANEL SIZE		MOUNTING		AIC RATING		LOAD			
120/230		200 AMP		SURFACE		22,000		72			
CIRCUIT NUMBER	DESCRIPTION	BREAKER SIZE	AMPS	AMPS	BREAKER SIZE	DESCRIPTION	CIRCUIT NUMBER				
1	WELL PUMP	30-2	12	4.5	20-1	CONVENIENCE RECEP.	2				
3	\			3	20-1	CONVENIENCE RECEP.	4				
5	SEWER SYSTEM	30-2	15	2	20-1	EXHAUST FAN	6				
7	\			2	20-1	CHLORINE DOSING	8				
9	PTAC HVAC	30-2	20	3	20-1	LIGHTS	10				
11	\			10	15-1	FUEL TANK	12				
13							14				
15							16				
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PANEL NOTES

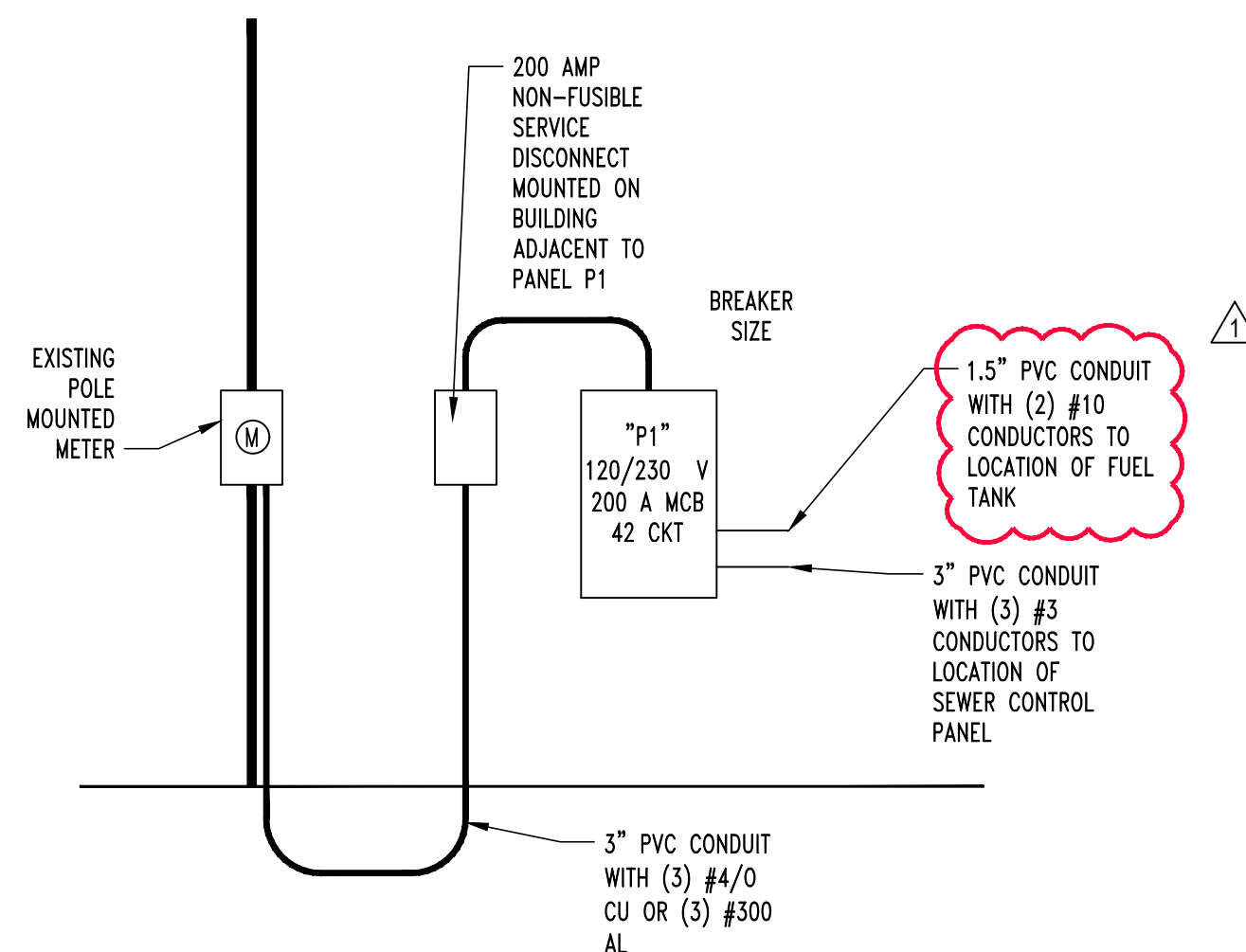
1. THE PANEL SHALL BE EQUAL TO SQUARE D MODEL "QO" OR APPROVED EQUAL.
2. ELECTRICIAN TO VERIFY BREAKER WITH EQUIPMENT PRIOR TO PURCHASE AND INSTALL.
3. AFTER COMPLETION OF WORK, ELECTRICIAN SHALL PROVIDE A TYPE WRITTEN PANEL DIRECTORY INSIDE THE NEW PANEL.
4. AT THE CAMPGROUND WELLHOUSE THE WELL PUMP IS A 5 HP PUMP. THE SAME BREAKERS ARE NEEDED.



1 E-102 WELLHOUSE POWER PLAN
SCALE: 1/2" = 1'-0"



4 E-102 GROUNDING DETAIL
NO SCALE



3 E-102 ELECTRIC RISER DIAGRAM
NO SCALE

2 E-102 WELLHOUSE LIGHTING PLAN
SCALE: 1/2" = 1'-0"

GENERAL NOTES

1. THE ENTIRE ELECTRICAL SYSTEM SHALL BE CONTINUOUSLY GROUNDED. EVERY BRANCH CONDUIT SHALL INCLUDE A GREEN GROUND CONDUCTOR SIZED PER NEC.
2. ARC-FAULT CIRCUITS SHALL BE RUN WITH A DEDICATED NEUTRAL AS REQUIRED BY THE MANUFACTURER.
3. PROVIDE PERMANENT ARC-FLASH LABEL AFFIXED TO EVERY DISCONNECT AND PANEL.
4. PROVIDE TYPE-WRITTEN PANEL SCHEDULE FOR ALL PANELS.
5. ALL CONDUCTOR SIZES SHOWN ON PLANS ARE FOR COPPER UNLESS NOTED OTHERWISE.
6. ABOVE GRADE CONDUCTORS SHALL BE THIN COPPER. BELOW GRADE CONDUCTORS SHALL BE XHHW-2.
7. MINIMUM CONDUCTOR SIZE SHALL BE #12 UNLESS NOTED OTHERWISE. 120V, 20 AMP CIRCUITS WITH CONDUCTOR LENGTH GREATER THAN 100' SHALL BE A MINIMUM OF #10.
8. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR MEASURING EXACT CONDUCTOR LENGTH AND INCREASING CONDUCTOR SIZE TO COMPENSATE FOR VOLTAGE DROP AS REQUIRED BY NEC.
9. SCHEDULE 40 PVC CONDUIT SHALL BE USED FOR SERVICE WIRING, BELOW GRADE APPLICATIONS, OR INSIDE THE CHLORINE ROOM. IN OTHER APPLICATIONS, EMT OR MC CABLE IS ACCEPTABLE WHERE CONDUCTORS ARE PROTECTED FROM DAMAGE, ENCLOSED IN BUILDING MATERIALS, AND CONSTRUCTION IS OF A PERMITTED TYPE. NM CABLE MAY BE USED.
10. CONTRACTOR TO PROVIDE J-BOXES, COVER PLATES, AND ANY ACCESSORIES REQUIRED TO PROVIDE A COMPLETE SYSTEM.
11. DUPLEX RECEPTACLES SHALL BE TAMPER RESISTANT, 20 AMP, EQUAL TO LEVITON CR20.
12. TOGGLE WALL SWITCHES SHALL BE EQUAL TO LEVITON CS120-2.
13. DIMMER SWITCHES SHALL BE TESTED WITH FIXTURES AND LAMPS FOR COMPATIBILITY.
14. THE BRANCH CIRCUIT FEEDING THE EMERGENCY FIXTURES SHALL BE THE SAME BRANCH AS THE CIRCUITS THAT IS SERVING THE NORMAL LIGHTING IN THE AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES.
15. OCCUPANCY AND VACANCY SENSORS SHOULD BE INSTALLED WITHIN BOTH ROOMS IN THE WELL HOUSE SO THAT LIGHTS WILL TURN OFF AFTER 20 MINUTES OF INACTIVITY.
16. COORDINATE INSTALLATION TO EXISTING METERS WITH CONSOLIDATED ELECTRIC.