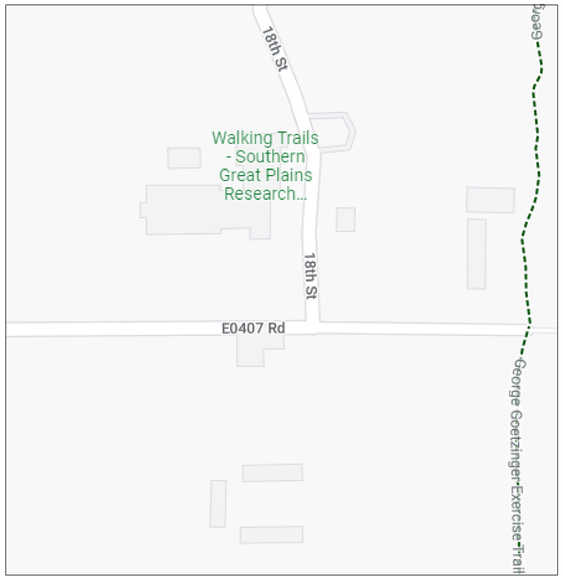
USDA AGRICULTURAL RESEARCH TECHNOLOGY CENTER
TASK ORDER #12805B22F0158
DESIGN UNDERGROUND UTILITY PLAN AND DEMOLITION OF BUILDING #7
2000 18TH STREET, WOODWARD, OK, 73801

DRAWING LIST

SHEET	DRAWING	TITLE
1	G001	GENERAL COVER SHEET
2	C1.0	ENGINEERING NOTES
3	C2.0	ENGINEERING SITE PLAN
4	PS001	PLUMBING SITE PLAN - DEMOLITION
5	M001	GENERAL NOTES, SYMBOLS & ABBREVIATIONS
6	MD101	MECHANICAL BASEMENT PLAN - DEMOLITION
7	MD102	MECHANICAL FIRST AND SECOND FLOOR PLAN - DEMOLITION
8	E001	GENERAL NOTES, SYMBOLS & ABBREVIATIONS
9	ES101	ELECTRICAL SITE PLAN - PHASE 1
10	ES102	ELECTRICAL SITE PLAN - PHASE 2
11	ES103	ELECTRICAL SITE PLAN - PHASE 3 AND ONE-LINE DIAGRAM

3

1 CS SITE LOCATION PLAN
SCALE: NTS



2 CS VICINITY PLAN
SCALE: NTS

SETTY
3040 WILLIAMS DRIVE, SUITE 600
FAIRFAX, VIRGINIA 22031
P: 703-691-2123
www.SETTY.com
PROFESSIONAL ENGINEERS

NO.	DATE	BY	DESCRIPTION
3	05-12-2023	xx	ADDENDUM 1
2	12-15-2022	xx	ISSUE FOR BID
1	10-26-2022	xx	100% CONSTRUCTION DOCUMENTS FOR REVIEW

REVISIONS

SETTY	USDA
PROJECT MANAGER: MK	CPM
DESIGNER: SS	PPM
CHECKED BY: MK	SAFETY & HEALTH
DRAWN BY: SS	REAL PROPERTY

USDA

Agricultural Research Service

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SOLICITATION NO.

DATE

PROJECT COVER SHEET

DWG. NO **G001**

SHEET 01 OF 11

GRADING NOTES:

1. NEW CONTOURS DENOTE TOP OF FINISHED PAVING OR GRADED AREA AS INDICATED. ALL SPOT ELEVATIONS ARE TO FINISHED GRADE, UNLESS NOTED OTHERWISE.
2. NOTIFY ENGINEER IF EXISTING GROUND CONDITIONS VARY FROM THOSE SHOWN ON PLANS.
3. PROVIDE POSITIVE DRAINAGE AT ALL TIMES WITHIN THE CONSTRUCTION AREAS. NO PONDING OF WATER SHALL BE ALLOWED. THE CONTRACTOR SHALL GRADE ALL AREAS TO POSITIVELY DRAIN AWAY FROM BUILDINGS.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DEWATER AND STABILIZE ANY SOFT SOILS AS NEEDED TO REACH OPTIMUM SOIL CONDITIONS.
5. ALL DISTURBED AREAS SHALL BE SODDED. CONTRACTOR SHALL BE RESPONSIBLE FOR SODDED AREAS UNTIL GROWTH IS ESTABLISHED.
6. TOPSOIL SHALL BE STRIPPED, STOCKPILED ON-SITE AND SPREAD AFTER GRADING OPERATIONS. TOPSOIL SHALL BE SPREAD TO A DEPTH NOT EXCEEDING 6 INCHES AND COORDINATED WITH THE LANDSCAPE PLANS AND SPECIFICATIONS.
7. CONTRACTOR SHALL PROVIDE WATER AS REQUIRED TO OBTAIN STANDARD COMPACTION.
8. THE EARTHWORK CONTRACTOR IS ULTIMATELY RESPONSIBLE TO IMPORT OR EXPORT MATERIAL AS NECESSARY TO ACHIEVE THE GRADES SHOWN ON THE CIVIL ENGINEER'S DOCUMENTS.
9. OFF-SITE BORROW SOILS SHALL BE EVALUATED AND APPROVED BY THE OWNER PRIOR TO USE ON THE SITE. ALL PROPOSED FILL SOILS SHALL BE TESTED AND APPROVED PRIOR TO PLACEMENT.
10. ALL DIMENSIONS OR ELEVATIONS MARKED TO MATCH EXISTING SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER OF ANY CONFLICTS WITH THE DRAWINGS PRIOR TO CONSTRUCTION.
11. GENERAL FILL MATERIAL MAY BE ANY NATIVE SOIL FREE OF DEBRIS, TRASH, ROCKS OVER 2 INCHES IN DIAMETER AND OTHER OBJECTIONABLE MATERIAL. GENERAL FILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT EXCEEDING 8" IN THICKNESS TO 95 PERCENT STANDARD DENSITY AS DEFINED BY ASTM D 698. IF FINE GRAINED SILT OR CLAY SOIL IS USED FOR FILL, CLOSE MOISTURE CONTROL WILL BE REQUIRED TO ACHIEVE THE RECOMMENDED COMPACTION.
12. WHEN RUBBLE IS ENCOUNTERED, IT SHALL BE OVER-EXCAVATED AND REMOVED, AND LAWFULLY DISPOSED OF. THE OVER-EXCAVATED AREAS SHALL BE RE-FILLED WITH GENERAL FILL.
13. THE CONTRACTOR IS RESPONSIBLE TO ENSURE ALL EXCAVATIONS ARE MADE IN ACCORDANCE WITH CURRENT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONSTRUCTION STANDARDS. IN ADDITION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH OSHA STANDARDS AND REGULATIONS PERTAINING TO ALL ASPECTS OF THE WORK INCLUDING ENTERING CONFINED SPACES.

SEDIMENTATION & EROSION CONTROL NOTES:

1. ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE EXECUTION OF ANY DEMOLITION OR GRADING WORK AND SHALL BE MAINTAINED BY THE GRADING CONTRACTOR FOR THE DURATION OF THE PROJECT.
2. SEDIMENT FILTER, SILT FENCE AND STABILIZED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED PER LOCAL JURISDICTIONAL REQUIREMENTS.
3. SEDIMENT COLLECTED BEHIND THE SEDIMENT FILTERS AND SILT FENCES SHALL BE REMOVED WHEN SEDIMENT REACHES ONE THIRD THE HEIGHT OF THE BARRIER.
4. SEDIMENT FILTERS AND SEDIMENT FENCES SHALL BE INSPECTED AND MAINTAINED NO LESS THAN WEEKLY OR WITHIN 24 HOURS OF A RAINFALL EVENT OF 0.5 INCHES OR MORE. MAINTENANCE SHALL INCLUDE BUT NOT LIMITED TO SEDIMENT REMOVAL, BARRIER REPAIR AND/OR REPLACEMENT.
5. THE CONTRACTOR SHALL CONSTRUCT AS A MINIMUM ONE STABILIZED CONSTRUCTION ENTRANCE. IF ADDITIONAL INGRESS OR EGRESS TO THE CONSTRUCTION SITE IS REQUIRED, THE CONTRACTOR SHALL COORDINATE THE LOCATION OF THESE ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES WITH THE CONSTRUCTION MANAGER. USAGE OF NON-STABILIZED POINTS FOR INGRESS AND EGRESS WILL NOT BE PERMITTED. THE STABILIZED ENTRANCES SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY AND PAVED DRIVING LANES. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT. REPAIR OF THE ENTRANCE(S) OR CLEANING OF THE RIGHT-OF-WAY AND PAVED DRIVING LANES THAT HAVE BEEN SOILED SHALL BE PERFORMED BY THE CONTRACTOR AT HIS OWN EXPENSE, SATISFACTORY TO THE CONSTRUCTION MANAGER. WHEN NECESSARY, VEHICLE WHEELS AND TIRES SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING ONTO PUBLIC RIGHT-OF-WAY AND PUBLIC STREETS. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE.
6. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PERIODICALLY WATER THE SITE TO CONTROL DUST.
7. SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE REMOVED FOLLOWING CONSTRUCTION OR UPON PERMANENT STABILIZATION OF THE DISTURBED AND GRADED AREAS, WHICHEVER OCCURS LAST.
8. CONSTRUCTION ENTRANCE SHALL BE THE FIRST CONSTRUCTION WORK ON THE PROJECT.
9. INSTALL SEDIMENT BARRIERS DOWN SLOPE FROM CONSTRUCTION ACTIVITIES THAT DISTURB SITE SOIL.
10. CONSTRUCT ROCK SURFACE FOR TEMPORARY PARKING, IF NEEDED.
11. FINAL GRADING - SEDIMENT BARRIERS WILL BE MAINTAINED DOWN SLOPE FROM DISTURBED SOIL DURING THIS OPERATION AND REMOVED UPON COMPLETION OF ON-SITE STABILIZATION.
12. THE ACTUAL SCHEDULE FOR IMPLEMENTING POLLUTANT CONTROL MEASURES WILL BE DETERMINED BY PROJECT CONSTRUCTION PROGRESS. DOWN SLOPE PROTECTIVE MEASURES MUST ALWAYS BE IN PLACE BEFORE SOIL IS DISTURBED.

CONCRETE NOTES:

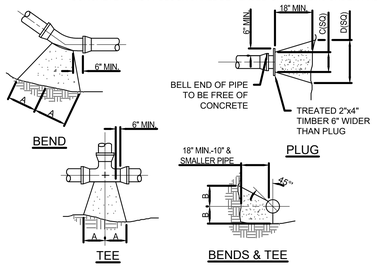
1. THE CONTRACTOR SHALL SAWCUT THE ENDS OF CURBS AND EDGE OF EXISTING PAVEMENT AS REQUIRED TO PROVIDE SMOOTH JOINT FOR JUNCTURE WITH NEW PAVEMENT.
2. CONCRETE SIDEWALKS, PAVING, AND CURBS SHALL BE ODOT CLASS 'A' CONCRETE. CONCRETE DITCHES, DRAINAGE SWALES, AND OTHER MISC ITEMS SHALL BE ODOT CLASS 'C' CONCRETE.
3. CONSTRUCTION SPECIFICATIONS NOT INCLUDED IN THE CONSTRUCTION DOCUMENTS SHALL BE IN ACCORDANCE WITH CURRENT O.D.O.T. SPECIFICATIONS.

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY WORK ORDERS AND PERMITS FROM THE PERMITTING AGENCY, INCLUDING PROVISIONS OF BONDS AND INSURANCE AS REQUIRED. THE CONTRACTOR SHALL PAY ALL PERMIT FEES, DUMP FEES AND OTHER ASSOCIATED FEES REQUIRED TO SUCCESSFULLY COMPLETE THE PROJECT AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL NOT START THE WORK UNTIL ALL PERMITS HAVE BEEN OBTAINED FROM THE JURISDICTIONAL AUTHORITIES.
2. ALL WASTE OR SPOIL SHALL BE TAKEN TO A STATE APPROVED OR SPREAD ON SITE AS DIRECTED BY THE OWNER AND ENGINEER.
3. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING PROPERTY, UTILITIES AND STRUCTURES OUTSIDE THE SCOPE OF WORK AND REPAIR SAME AT HIS OWN EXPENSE.
4. CIVIL ENGINEER WILL NOT INTERPRET SOILS REPORTS OR ACCEPT RESPONSIBILITY FOR ALTERNATIVE METHODS PROPOSED BY THE CONTRACTOR.
5. CORRECTIVE MEASURES DIRECTED BY THE ENGINEER MAY INCLUDE COMPLETE REMOVAL AND REPLACEMENT AT NO COST TO OWNER IN CASES OF POOR WORKMANSHIP OR UNSATISFACTORY IN-PLACE CONDITIONS.
6. CONTRACTOR AND ALL RELATED CONSTRUCTION ACTIVITIES ARE REQUIRED TO MAINTAIN NORMAL NOISE LEVELS AND ALL EQUIPMENT AND VEHICLES ARE REQUIRED TO BE PROPERLY MUFFLED.
7. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURFACE AND UNDERGROUND FACILITIES DURING ALL PHASES OF WORK. LOCATION OF ALL UNDERGROUND FACILITIES ARE APPROXIMATE AND FOR THE CONTRACTOR'S GUIDANCE ONLY.
8. UNDERGROUND FACILITIES, WHETHER INDICATED OR NOT, SHALL BE LOCATED AND FLAGGED BY THE UTILITIES AT THE REQUEST OF THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OR THE NOTIFICATION CENTER OF OKLAHOMA ONE CALL "CALL OKIE" TO MARK OR FLAG THE LOCATION OF THEIR FACILITIES IN THE FIELD (1-800-522-6543 OR 811) NO SOONER THAN TEN DAYS NOR LATER THAN 48 HOURS, (EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS), PRIOR TO EXCAVATION.
9. THE CONTRACTOR SHALL REPAIR, AT HIS EXPENSE, ANY DAMAGES TO EXISTING LOCATED FACILITIES CAUSED DIRECTLY OR INDIRECTLY BY HIS OPERATIONS.
10. SURVEY INFORMATION PROVIDED BY OWNER. BEFORE PROCEEDING, THE CONTRACTOR SHALL SATISFY HIMSELF THAT A CONFLICT DOES NOT EXIST AND THAT THE UNDERGROUND WORK CAN BE PERFORMED AS SHOWN ON THE PLANS. IF, IN THE OPINION OF THE CONTRACTOR, A CONFLICT DOES EXIST, HE SHALL IMMEDIATELY NOTIFY THE ENGINEER WHO WILL MAKE THE FINAL DETERMINATION FOR RESOLVING THE CONFLICT.
11. THE CONTRACTOR SHALL SATISFACTORILY CLEAN THE AREA OF ALL RUBBISH, EXCESS MATERIAL, MUD AND DEBRIS AND ALL PARTS OF THE WORK AREA SHALL BE LEFT IN A NEAT AND PRESENTABLE CONDITION. ALL DISTURBED AREAS SHALL BE RESTORED TO A LEVEL AND SMOOTH SURFACE PRIOR TO ACCEPTANCE OF THE WORK. DEBRIS, ETC. SHALL BE DISPOSED OF AT AN APPROVED FACILITY IN A LEGAL MANNER.
12. THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY BARRICADES, WORKING SIGNS, LIGHTS, FLASHERS AND FLAG PERSONS AS REQUIRED BY THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", TO PROVIDE FOR THE SAFETY OF WORKERS AND THE PUBLIC AT LARGE. TEMPORARY FENCING SHALL BE INSTALLED AROUND ANY OPEN AREAS OF THE SITE.
13. THE CONTRACTOR SHALL NOT ENCROACH ON PRIVATE PROPERTY OUTSIDE THE WORK AREAS WITHOUT WRITTEN PERMISSION FROM THE AFFECTED PROPERTY OWNER.

DEMOLITION NOTES:

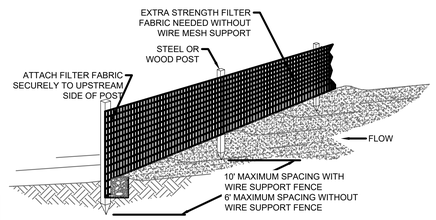
1. CONTRACTOR SHALL CONFORM WITH ALL APPLICABLE CODES (LOCAL, STATE AND FEDERAL) FOR DEMOLITION, DUST CONTROL, EROSION CONTROL AND DISPOSAL OF DEMOLITION MATERIAL AND DEBRIS.
2. EXISTING UNDERGROUND LINES HAVE BEEN SHOWN TO THE EXTENT KNOWN. THE EXACT LOCATIONS AND NOTIFICATIONS OF THE PROPER AGENCY IS THE RESPONSIBILITY OF THE CONTRACTOR PRIOR TO ANY EXCAVATION.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, PAVEMENT AND OTHER IMPROVEMENTS NOT SCHEDULED FOR REMOVAL. ANY DAMAGE TO EXISTING UTILITIES AND/OR PAVED STREETS CAUSED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL UNSUITABLE MATERIALS AND DEBRIS ENCOUNTERED OR GENERATED BY THE REMOVAL OPERATIONS, INCLUDING CONCRETE, ASPHALT, OIL, BRICK, ROCK PIPES, ETC. NO UNSUITABLE MATERIAL, SUCH AS DETERMINED BY THE OWNER'S REPRESENTATIVE, SHALL BE USED FOR BACKFILLING OR EMBANKMENT CONSTRUCTION. THE COST FOR DISPOSAL OF THE UNSUITABLE MATERIAL SHALL BE SUBSIDIARY TO THE PROJECT.
5. STORM WATER POLLUTION PREVENTION PLAN BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED PRIOR TO ANY REMOVALS.
6. ALL DEBRIS RESULTING FROM CONSTRUCTION OPERATIONS SHALL BE HAULED OFF-SITE AND PROPERLY DISPOSED OF. THE OWNER SHALL HAVE FIRST RIGHTS TO ANY MATERIALS THAT HE DEEMS SALVAGEABLE. MISCELLANEOUS STRUCTURES, CONCRETE, RUBBLE AND OTHER ITEMS SHALL BE REMOVED COMPLETELY OR DEMOLISHED TO 3' BELOW EXISTING GRADE.
7. REFER TO ARCHITECTURAL PLANS FOR SPECIFIC BUILDING REMOVAL ITEMS
8. SAW CUT FULL DEPTH ALL PAVEMENT AT JOINT LINES
9. THE CONTRACTOR SHALL KEEP THE SITE CLEAN DURING CONSTRUCTION AND SUPPLY CONSTRUCTION CONTAINERS OR DUMPSTERS TO MAINTAIN ALL TRASH AND DEBRIS.
10. ENSURE UTILITIES TO BE CUT AND CAPPED ARE CUT STRAIGHT AND NEAT. CAP SHALL UTILIZE A MECHANICALLY RESTRAINED JOINT AND A CONCRETE THRUST BLOCK SHALL BE PLACED ON SYSTEMS UNDER PRESSURE.

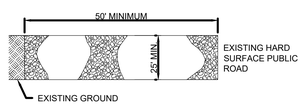


NOTE:
1. CONCRETE TO BE ODOT CLASS C OR EQUAL

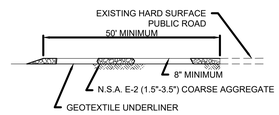
SIZE	90° BEND		45° BEND		22 ½° BEND		TEES & VALVES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
<6"	13"	10"	7"	10"	6"	10"	9"	10"	19"	21"
8"	20"	11"	11"	11"	8"	11"	14"	11"	24"	29"
10"	26"	13"	14"	13"	10"	13"	18"	13"	30"	36"

3 THRUST BLOCKING
SCALE: NTS

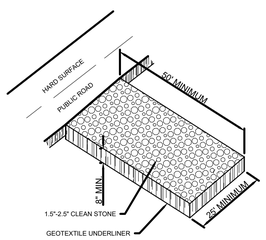




PLAN



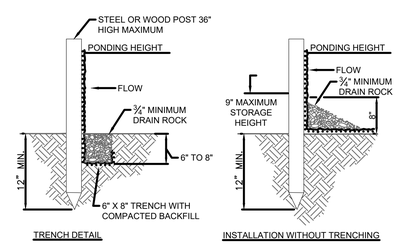
PROFILE



2 CONSTRUCTION ENTRANCE
SCALE: NTS

DETAILS NOTES:

1. STONE SIZE SHALL BE N.S.A. R-2 (1.5" TO 3.5") COARSE AGGREGATE WITH A GEOTEXTILE UNDERLINER.
2. LENGTH-AS EFFECTIVE, BUT NO LESS THAN 50 FEET.
3. THICKNESS NOT LESS THAN EIGHT (8) INCHES.
4. WIDTH NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS, OR AS INDICATED ON THE PLAN.
5. WASHING WHEN NECESSARY. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED. IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATER-COURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS OR OTHER APPROVED METHODS.
6. MAINTENANCE-THE ENTRANCE/EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE.
7. GEOTEXTILE SHALL MEET AASHTO M288 "SEPARATION GEOTEXTILE PROPERTY REQUIREMENTS"



NOTES:
1. MUST BE INSTALLED PROPERLY TO AVOID NOTICE OF VIOLATION.
2. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE POUNDING EFFICIENCY.
3. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM RECOMMENDED STORAGE HEIGHT.
4. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
5. FABRIC SHALL MEET AASHTO M288 TEMPORARY SILT FENCE PROPERTY REQUIREMENTS

1 FABRIC FILTER SILT FENCE
SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
DANIEL L. ASHBAUGH
OKLAHOMA 27745
5/12/2023
CERTIFICATE OF AUTHORITY No. CA 1587
EXPIRATION DATE 06/30/2023
ENGINEER OF RECORD
DANIEL L. ASHBAUGH
LICENSE NO. 27745

walter p moore
Walter P. Moore and Associates, Inc.
7666 East 61st Street, Suite 251
Tulsa, Oklahoma 74133
918.806.7200 main

101 Park Avenue, Suite 1300
Oklahoma City, Oklahoma 73102
405.493.0500

SETTY
3400 NW LAKE DRIVE, SUITE 400
FARMAS, OKLAHOMA 23232
P 765-495-0112
SETTY
PROJECT NUMBER: 1472.00.01

NO.	DATE	BY	DESCRIPTION
3	05-12-2023	—	CONCRETE NOTES
2	12-15-2022	—	ISSUE FOR BID
1	10-26-2022	XX	100% CONSTRUCTION DOCUMENTS FOR REVIEW

REVISIONS

WPM	USDA
PROJECT MANAGER DLA	EPM JP
DESIGNER DCC	PPM BD
CHECKED BY JDD	SAFETY & HEALTH DC
DRAWN BY DCC	REAL PROPERTY WR

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AGRICULTURAL RESEARCH TECHNOLOGY CENTER

SOLICITATION NO.
DATE 12/15/2022

ENGINEERING NOTES AND DETAILS

DWG. NO C1.0
SHEET OF

Original drawing size is 30"x42"; Scale entities accordingly if reduced/enlarged.

ELECTRICAL GENERAL NOTES

1. INSTALLATION OF ALL WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING REGULATIONS, CODES, ETC.:
   A. LOCAL CODES AND ORDINANCES.
   B. PRACTICES AND PROCEDURES FOLLOWING OSHA STANDARDS.
   C. THE EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70 (NEC) IN EFFECT.
   D. THE EDITION OF THE INTERNATIONAL BUILDING CODE IN EFFECT.
2. BEFORE SUBMITTING BIDS, THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL ADJOINING EXISTING BUILDINGS, EQUIPMENT, AND SPACE CONDITIONS ON WHICH HIS WORK IS IN ANY WAY DEPENDENT FOR THE BEST WORKMANSHIP AND OPERATION ACCORDING TO THE INTENT OF THE SPECIFICATIONS AND DRAWINGS. CONTRACTOR SHALL REPORT TO THE ARCHITECT/ENGINEER ANY CONDITION WHICH MIGHT PREVENT HIM FROM INSTALLING HIS EQUIPMENT IN THE MANNER SPECIFIED OR AS SHOWN IN CONTRACT DOCUMENTS TEN BUSINESS DAYS PRIOR TO SUBMISSION OF BIDS. NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT THE SITE, NOR FOR ANY ALLEGED MISUNDERSTANDING OF MATERIALS TO BE FURNISHED OR WORK TO BE PERFORMED. THE CONTRACTOR SHALL INCLUDE IN HIS BID PRICE ALL LABOR AND MATERIAL THAT MAY AFFECT HIS WORK.
3. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCOVERED CONFLICTS BETWEEN EXISTING INSTALLATIONS WHICH ARE NOT SCHEDULED FOR DEMOLITION AND THE NEW WORK INDICATED WITHIN THE CONTRACT DOCUMENTS. SUCH NOTIFICATION SHALL BE ACCOMPANIED BY A DRAWING DELINEATING THE PROPOSED SOLUTION PRIOR TO STARTING ANY WORK IN THE AFFECTED AREA.
4. PRIOR TO BEGINNING ANY WORK, SECURE NECESSARY PERMITS OR CLEARANCES FROM THE AUTHORITIES HAVING JURISDICTION. PROVIDE ALL LABOR AND MATERIALS FOR A COMPLETE INSTALLATION. WORK SHALL BE EXECUTED BY EXPERIENCED ELECTRICIANS WHO ARE LICENSED IN THE JURISDICTION WHERE THE PROJECT IS LOCATED.
5. CONTRACTOR TO PROVIDE SUFFICIENT NOTICE TO THE OWNER'S REPRESENTATIVE PRIOR TO ANY WORK TO ALLOW ADEQUATE TIME FOR COORDINATION OF EXISTING BUILDING ACTIVITIES WITH THE CONSTRUCTION WORK.
6. CONTRACTOR TO INCLUDE IN THEIR SCOPE ALL LABOR, MATERIALS, SERVICES, APPARATUS AND SHOP DRAWINGS IN ADDITION TO THE CONTRACT DOCUMENTS AS REQUIRED TO COMPLY WITH ALL APPLICABLE GOVERNING LAWS, CODES AND JURISDICTION REQUIREMENTS. PROVIDE ELECTRICAL EQUIPMENT WITH ALL ASSOCIATED ACCESSORIES, BRANCH CIRCUIT WIRING AND CONDUIT INFRASTRUCTURE AS REQUIRED TO ENSURE A COMPLETE AND OPERATIONAL SYSTEM.
7. CONTRACTOR SHALL PROVIDE WRITTEN CERTIFICATION THAT ALL PRODUCTS, MATERIALS AND PROCESSES INSTALLED IN THE SPACE CONTAINS NO ASBESTOS OR PCB.
8. DELIVER PRODUCTS TO PROJECT SITE IDENTIFIED WITH NAMES, MODEL NUMBERS, TYPES, GRADES, COMPLIANCE LABELS, AND OTHER INFORMATION NEEDED FOR DISTINCT IDENTIFICATION; ADEQUATELY PACKAGED AND PROTECTED TO PREVENT DAMAGE DURING SHIPMENT, STORAGE, AND HANDLING. PROTECT STORED EQUIPMENT AND MATERIALS FROM DAMAGE. COMPLY WITH MANUFACTURER'S RIGGING AND MOVING INSTRUCTIONS FOR UNLOADING EQUIPMENT AND MOVING INTO FINAL LOCATION.
9. ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. COORDINATE WITH EQUIPMENT VENDOR TO VERIFY EXACT LOCATION AND CONNECTION REQUIREMENTS PRIOR TO INSTALLATION.
10. ALL EQUIPMENT SUCH AS RELAYS, SWITCHES, PANELS, AND OTHER APPURTENANCES SHALL HAVE IDENTIFICATION PLATES OF WHITE LAMINATED PLASTIC WITH 1/2" BLACK LETTERS. ALL JUNCTION BOXES IN CEILING CAN BE MARKED WITH BLACK PERMANENT MARKER ON COVER PLATES AS PANEL DESIGNATION AND CIRCUIT NUMBER FROM WHICH THEY ARE FED.
11. ALL CONDUCTORS SHALL BE IDENTIFIED. ALL WIRING DEVICES SHALL BE USED WITH TYPED LABEL ON THE COVER PLATE IDENTIFYING THE PANEL DESIGNATION AND CIRCUIT NUMBER FROM WHICH THEY ARE FED.
12. CONTROL WIRING SHALL BE TAGGED AT EACH END AND TERMINATED WHERE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH EQUIPMENT MANUFACTURES SPECIFICATIONS.
13. ALL CONNECTIONS TO DEVICES SHALL BE TAPED WITH SCOTCH 33 ELECTRICAL TAPE.
14. ALL EQUIPMENT SHALL BE "UL" LISTED.
15. ALL DEVICES, FIXTURES AND MATERIALS INSTALLED IN A PLENUM RATED ENVIRONMENT SHALL BE LISTED FOR THE APPLICATION.
16. ALL MATERIALS AND WORK SHALL BE ACCORDING TO BASE BUILDING SPECIFICATIONS UNLESS OTHERWISE NOTED.
17. ALL CONDUITS AND JUNCTION BOXES SHALL BE CONCEALED IN FINISHED AREAS. PRIOR TO CONCEALMENT OF NEW CONSTRUCTION, ALL WORK BEHIND FINISHED SURFACES SHALL BE INSPECTED BY THE OWNER'S REPRESENTATIVE.
18. IF MATERIAL OR EQUIPMENT IS INSTALLED BEFORE IT IS APPROVED, THE CONTRACTOR SHALL BE LIABLE FOR ITS REMOVAL AND REPLACEMENT AT NO ADDITIONAL CHARGE OR IF IN THE OPINION OF THE ARCHITECT OR ENGINEER, THE MATERIAL OR EQUIPMENT DOES NOT MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.
19. ALL SLAB PENETRATIONS MUST BE X-RAYED OR SCANNED WITH A RADAR PRIOR TO CORE DRILLING. OBTAIN APPROVAL FROM OWNER'S REPRESENTATIVE PRIOR TO ANY CORE DRILLING.
20. PROVIDE FIRESTOPPING MATERIALS TO MAINTAIN INTEGRITY OF THE FIRE RATED CONSTRUCTION WHERE CONDUITS PASS THROUGH WALLS AND FLOORS.
21. INSTALLATION OF EQUIPMENT, COMPONENTS AND WIRING FOR ELECTRICAL SYSTEMS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF EQUIPMENT MANUFACTURER.
22. ALL EXISTING PANELS IMPACTED BY THIS PROJECT SHALL BE PROVIDED WITH NEW UPDATED TYPEWRITTEN PANEL SCHEDULES INDICATING THE FINAL ROOM NUMBER AND THE EQUIPMENT OR DEVICES SERVED BY THE CIRCUIT. CONTRACTOR TO BALANCE THE NEW LOADS ON ALL THREE PHASES FOR EACH PANELBOARD WHERE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S SPECIFICATIONS.
23. CONTRACTOR'S SCOPE OF WORK INCLUDES TRACING ALL EXISTING CIRCUITS IN THE CONSTRUCTION AREA BACK TO SOURCE. IF REMOVAL OF EXISTING ELECTRICAL EQUIPMENT AFFECTS ANY EXISTING CIRCUITS, CONTRACTOR SHALL PROVIDE CIRCUIT BREAKERS, WIRING, CONDUIT, ETC. REQUIRED TO RECONNECT EXISTING-TO-REMAIN ELECTRICAL EQUIPMENT BACK TO SOURCE.
24. THE CONTINUITY OF ALL EXISTING CIRCUITS TO REMAIN SHALL BE MAINTAINED.
25. ELECTRICAL SYSTEMS SHALL BE GROUNDED PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
26. PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL BRANCH CIRCUITS AND FEEDERS INSTALLED IN RACEWAYS. THE DEDICATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED PER NEC SECTION 250.122. SOLE USE OF METAL RACEWAY AS A GROUNDING CONDUCTOR SHALL NOT BE ACCEPTABLE. WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC SECTION 518.4 FOR ALL ASSEMBLY AREAS.
27. ALL CONDUCTORS SHALL BE COPPER. MINIMUM SIZE SHALL BE #12 AWG. CONDUCTOR #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. CONDUCTOR SHALL HAVE THHN/THWN-2 INSULATION OR AS NOTED.
28. PROVIDE MINIMUM 3/4" CONDUIT FOR POWER CIRCUITS.
29. TYPE MC CABLE MAY BE USED IN LIEU OF EMT FOR BRANCH CIRCUITS, IN DRYWALL PARTITION AND IN CEILING PLENUM WHERE ALLOWED BY NEC AND THE BUILDING OWNER. MC CABLE FOR ISOLATED CIRCUIT SHALL HAVE TWO (2) SEPARATE GROUNDING CONDUCTORS.
30. NUMBER OF WIRES MAY NOT BE INDICATED FOR ALL CIRCUITS, ONLY THOSE WHERE CLARIFICATION IS NECESSARY. PROVIDE ALL WIRE NECESSARY FOR THE PROPER FUNCTION OF THE SYSTEM WHETHER INDICATED ON PLAN OR NOT.
31. PROVIDE EACH CIRCUIT HOMERUN WITH A DEDICATED NEUTRAL CONDUCTOR AND INSULATED EQUIPMENT GROUNDING CONDUCTOR.
32. ALL BACK BOXES INSTALLED IN PARTITION WALLS SHALL BE STAGGERED. BACK-TO-BACK INSTALLATION IS NOT PERMITTED.
33. PROVIDE ACCESS PANELS FOR ALL INACCESSIBLE JUNCTION BOXES AS REQUIRED BY THE N.E.C.
50. ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL, PLUMBING AND OTHER TRADES TO PROVIDE ALL EQUIPMENT ASSOCIATED WITH THEIR RESPECTIVE TRADES WITH NECESSARY WIRING AND CONDUIT INFRASTRUCTURE FOR ALL SENSORS, CONTROL SYSTEMS AND REMOTE MOUNTED CONTROL PANELS AS REQUIRED.
51. ALL ELECTRICAL WORK, INCLUDING BUT NOT LIMITED TO DEVICES, EQUIPMENT, CONDUITS AND BOXES IN PARKING SPACES AND DRIVE AISLES OF COVERED GARAGE AREAS MUST BE INSTALLED TO MAINTAIN A MINIMUM HEIGHT CLEARANCE OF 98 INCHES FOR HANDICAP SPACES AND 84 INCHES FOR ALL OTHER SPACES.
52. CONTRACTOR TO COORDINATE ELECTRICAL WORK TO AVOID INTERFERENCE BETWEEN ALL OTHER TRADES.
   A. DETERMINE INTERFERENCE BEFORE WORK IS FABRICATED OR INSTALLED. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL DETAILS OF WORK AND WORKING CONDITIONS AND COORDINATE WORK DURING PRELIMINARY STAGES TO ENSURE ACTUAL ERECTION WILL PROCEED WITHOUT INTERFERENCE. COORDINATION IS OF PARAMOUNT IMPORTANCE AND NO REQUESTS FOR ADDITIONAL PAYMENT WILL BE CONSIDERED WHERE REQUEST IS BASED ON INTERFERENCE.
   B. WHERE JOB CONDITIONS REQUIRE REASONABLE DEVIATIONS FROM CONTRACT DOCUMENTS, MAKE DEVIATIONS WITHOUT ADDITIONAL COST TO OWNER, AFTER OBTAINING APPROVAL OF ARCHITECT.
   C. PROVIDE MAXIMUM PRACTICAL SPACE FOR OPERATION, REPAIR, REMOVAL, AND TESTING OF ELECTRICAL EQUIPMENT. APPROVED DEVIATIONS MAY BE MADE TO PROVIDE REQUIRED ACCESSIBILITY.
   D. KEEP CONDUITS, WIREWAYS AND SIMILAR ITEMS AS CLOSE AS POSSIBLE TO CEILING, WALLS AND COLUMNS IN ORDER TO TAKE UP MINIMUM AMOUNT OF SPACE. ALL WORK TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
   E. PROVIDE OFFSETS, FITTINGS AND SIMILAR ITEMS NECESSARY TO ACCOMPLISH REQUIREMENTS OF COORDINATION WITHOUT ADDITIONAL EXPENSE TO OWNER.
   F. PROVIDE ACCESS TO AND CLEARANCES AROUND EQUIPMENT AS REQUIRED BY THE N.E.C.
54. TESTING:
   A. TEST AND ADJUST EQUIPMENT AND SYSTEMS INSTALLED AND DEMONSTRATE PROPER OPERATION TO OWNER'S REPRESENTATIVE. NO EQUIPMENT SHALL BE TESTED OR OPERATED FOR ANY PURPOSE UNTIL IT HAS BEEN FULLY PREPARED FOR OPERATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
   B. SHOW, BY DEMONSTRATION IN SERVICE, THAT ALL CIRCUITS AND DEVICES ARE IN GOOD OPERATING CONDITION. EACH PIECE OF EQUIPMENT AND COMPONENT OF THE ELECTRICAL SYSTEM SHALL FUNCTION NOT LESS THAN FIVE TIMES IN COURSE OF THE ACCEPTANCE TESTS.
   C. FUNCTIONAL TESTING FOR LIGHTING CONTROL SYSTEM SHALL BE IN ACCORDANCE WITH IECC. THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED, AND IN PROPER WORKING CONDITION, PER CONSTRUCTION DOCUMENTS AND FACTORY INSTRUCTIONS.

120V BRANCH CIRCUIT WIRING CONDUCTOR SIZE

DEPENDING ON BRANCH CIRCUIT RUN LENGTH FROM PANELBOARD TO THE LAST DEVICE ON THE BRANCH CIRCUIT, THE CONTRACTOR SHALL INCREASE THE BRANCH CIRCUIT WIRE SIZE AS PER THE TABLE BELOW.

MAXIMUM #10 WIRE SHALL BE USED FOR GENERAL RECEPTACLE CIRCUIT WIRING.

LENGTH (FEET)	VOLTAGE (V)	AMPACITY (A)	WIRE SIZE (AWG TYP.)
0-66	120	20	#12
0-102	120	20	#10

ELECTRICAL GENERAL DEMOLITION NOTES

1. GENERAL:
   A. BEFORE SUBMITTING THEIR BID, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE TO VERIFY THE EXISTING CONDITIONS AND SCOPE OF WORK AREA. NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT THE SITE, NOR FOR ANY ALLEGED MISUNDERSTANDING OF WORK TO BE PERFORMED. THE CONTRACTOR SHALL INCLUDE IN HIS BID PRICE ALL LABOR AND MATERIAL THAT MAY AFFECT HIS WORK.
   B. THE GENERAL EXTENT OF EXISTING ELECTRICAL WORK TO BE DISMANTLED AND REMOVED OR RELOCATED IS INDICATED ON THE DRAWINGS.
   C. ALL COMPONENTS ASSOCIATED WITH SYSTEMS AND EQUIPMENT TO BE REMOVED OR RELOCATED MAY NOT BE SPECIFICALLY INDICATED. REMOVE ALL ASSOCIATED ELECTRICAL ACCESSORIES AND COMPONENTS INCLUDING BUT NOT LIMITED TO HANGERS, WIRING, CONDUIT, BOXES AND ALL ADDITIONAL MISCELLANEOUS ITEMS RELATED TO THE EXISTING EQUIPMENT INDICATED TO BE REMOVED OR RELOCATED. REMOVE ALL ASSOCIATED WIRING AND CONDUIT BACK TO THE SOURCE OF SUPPLY IN EXISTING CIRCUITS WHICH ARE TO BE DEMOLISHED. UNLESS SPECIFICALLY INDICATED, NO EQUIPMENT, MATERIALS OR ASSOCIATED COMPONENTS SHALL BE ABANDONED IN PLACE.
   D. ABANDON ALL CONDUITS CONCEALED IN CONCRETE WALLS OR SLABS. REMOVE ALL WIRING FROM ABANDONED CONDUITS BACK TO SOURCE OF SUPPLY.
2. DISPOSAL OF DEMOLITION:
   A. CONTRACTOR SHALL CLEAN THE PROJECT SITE AT THE END OF EACH WORKING DAY. NOTIFY THE BUILDING OWNER PRIOR TO DISPOSAL OF DEMOLISHED MATERIALS TO ALLOW SALVAGE OF ANY USABLE MATERIALS. AFTER INSPECTION FROM THE OWNERS REPRESENTATIVE, ALL UNUSED MATERIALS SHALL BE REMOVED FROM THE JOB SITE WITH DISPOSAL IN ACCORDANCE WITH APPLICABLE SPECIFICATIONS AND REGULATIONS.
3. PROTECTION:
   A. PROTECT FROM DAMAGE ALL EXISTING EQUIPMENT, DEVICES AND MATERIALS TO REMAIN. ANY EXISTING MATERIALS AND EQUIPMENT DAMAGED DURING THE COURSE OF THE CONSTRUCTION PROCESS SHALL BE REPLACED WITH MATERIALS AND EQUIPMENT CONFORMING TO EXISTING SPECIFICATIONS AT NO ADDITIONAL COST TO THE OWNER.
4. TERMINATION AND PATCHING:
   A. DISCONNECT EXISTING EQUIPMENT AND DEVICES WITH ASSOCIATED ACCESSORIES, CONDUIT AND WIRING BACK TO SOURCE OF SUPPLY.
   B. WHERE EXISTING FLOORS, WALLS AND ROOFS MUST BE CUT OR ARE DAMAGED DURING THE CONSTRUCTION PROCESS, PATCH THE CUT OR DAMAGED AREAS TO MATCH THE ADJACENT CONSTRUCTION.
   C. THE CONTINUITY OF ALL EXISTING CONDUITS AND FEEDERS SERVICING AREAS AND EQUIPMENT TO REMAIN SHALL BE MAINTAINED. MODIFY THE EXISTING CIRCUITS IF REQUIRED IN ORDER TO MAINTAIN THE EXISTING CIRCUITRY.

DIVISION 27 INSTALLATION NOTES

PROJECT SPECIFIC NOTES
1. INSTALL MULTIMODAL FIBER OPTIC CABLE FROM DMARC POINT IN BUILDING 6, ROOM 204 TO BUILDING 54, ROOM 5403. CABLE PULLED THROUGH LOW VOLTAGE CONDUIT IN NEW DUCTBANK.
2. NEW CABLING TO BE CERTIFIED TO SUPPORT REQUIRED DATA/SIGNALING RATES.
3. PROVIDE PRINTED TEST RESULTS TO CO AND COR. TEST RESULTS SHALL BE PRINTED DIRECTLY FROM TESTING UNIT OR MANUFACTURER'S OFFICIAL APPLICATION. TEST RESULTS SHOULD INCLUDE EXPECTED RESULT AND ACTUAL TEST RESULT.
4. SLEEVES AND PENETRATIONS SHOULD BE APPROVED BY CO AND COR PRIOR TO INSTALLATION.
5. SEAL ALL OPENINGS AND PENETRATIONS. ENSURE SEALS MEET ALL FIRE CODE REQUIREMENTS.

SINGLE-MODE FIBER OPTIC CABLE SPECIFICATION
1. 12-STRAND LC/LC SINGLEMODE INDOOR/OUTDOOR NON-ARMOR PLENUM, 24IN 900um BREAKOUT

TERMINATION AND TESTING SPECIFICATION
1. CABLES TO BE FACTORY TERMINATED WHENEVER POSSIBLE.
2. TESTING PROCEDURES TO CONFORM TO ANSI/TIA/EIA-568-A COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD WITH LATEST AMENDMENTS AND APPLICABLE ADDENDA AND ISO/IEC 11801 INTERNATIONAL GENERIC CABLING FOR CUSTOMER PREMISES STANDARD WITH LATEST AMENDMENTS AND APPLICABLE ADDENDA.
3. TEST EACH FIBER STRAND FOR ATTENUATION WITH LIGHT SOURCE AND OPTICAL POWER METER. TEST OPTIC LINK FOR ATTENUATION WITH LATEST AMENDMENTS WITH LIGHT SOURCE AND POWER METER. TEST ANY SPLICES FOR ATTENUATION WITH OPTICAL TIME DOMAIN REFLECTOMETER (OTDR). VERIFY CABLE LENGTH WITH SHEATH MARKINGS.
4. HORIZONTAL DISTRIBUTION MULTIMODE OPTICAL FIBER CABLE ATTENUATION SHALL BE MEASURED IN BI-DIRECTION AT EITHER 850nm OR 1300nm USING AND LED LPSM.
5. SINGLE MODE OPTICAL FIBER CABLE ATTENUATION SHALL BE MEASURED IN BI-DIRECTION AT EITHER 1310nm OR 1550nm USING A LASER LPSM. OS1 IS DEFINED IN ISO/IEC 11801 AND OS2 IS DEFINED IN ISO/IEC 24702.
6. BACKBONE MULTIMODE OPTICAL FIBER CABLE SHALL BE TESTED AT BOTH 850 nm AND 1300nm IN ONE DIRECTION. TEST PROCEDURES SHALL BE IN ACCORDANCE WITH ANSI/TI/EIA-526-14 STANDARD, METHOD B.
7. ALL TEST RESULTS SHALL BE SHARED WITH CO AND COR WITHIN 2 WEEKS OF INSTALLATION.
8. PROVIDE THE FOLLOWING DOCUMENTATION FOR OTDR TEST RESULTS, AS PER TIA-568-C.0
   A. DATE OF THE TEST
   B. TEST PERSONNEL
   C. DESCRIPTION OF THE FIELD INSTRUMENT TEST EQUIPMENT USED INCLUDING MANUFACTURER MODEL NUMBER AND SERIAL NUMBER
   D. TEST EQUIPMENT CALIBRATION DATE
   E. TYPE AND LENGTH OF ALL LAUNCH CABLES
   F. FIBER CABLE IDENTIFICATION.
   G. TRACE FILE
   H. TESTED WAVELENGTHS
   I. MEASURED LOSS

REFERENCED STANDARDS
ANSI/TIA/EIA-568-C.0-2 GENERIC TELECOMMUNICATIONS CABLING FOR CUSTOMER PREMISES - ADDENDUM 2, GENERAL UPDATES.
ANSI/TIA/EIA-568-C.1 COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
ANSI/TIA/EIA-568-C.3 OPTICAL FIBER CABLING COMPONENTS STANDARD
ANSI/TIA/EIA-526-7 (OFSTP-7) MEASUREMENT OF OPTICAL POWER LOSS OF INSTALLED SINGLE-MODE FIBER CABLE PLANT
ANSI/TIA/EIA-526-14 (OFSTP-14) OPTICAL POWER LOSS MEASUREMENTS OF INSTALLED MULTIMODE FIBER CABLE PLANT
AEN 068: IMPROVING MULTIMODE FIBER TESTING ACCURACY WITH MANDREL WRAPPING
AEN 104: STANDARDS COMPLIANT OPTICAL TEST EQUIPMENT AND TEST PROCEDURES
AEN 115: PLUG & PLAY LINK LOSS BUDGET DETERMINATION
AEN 129: WHAT IS ENCIRCLED FLUX AND OTHER RELATED QUESTIONS
AEN 134: OTDR TESTING BASICS
AEN 135: FIBER OPTIC SYSTEM TESTING TUTORIAL

CABLE IDENTIFICATION
1. CABLE IDENTIFICATION TO CONFORM TO EXISTING IDENTIFICATION LABELING SCHEME.
2. PROVIDE LABELS AT EACH CABLE END AND IN ANY ACCESSIBLE LOCATION.

3

ELECTRICAL SYMBOL LIST
(STANDARD SYMBOLS, ALL SYMBOLS MAY NOT APPEAR ON THE DRAWINGS)

- PULL BOX
- CONDUIT ROUTING
- DUCT BANK ROUTING
- CONTINUATION CIRCUIT
- FUSIBLE DISCONNECT SWITCH
- ELECTRICAL PANEL
- DRY TYPE TRANSFORMER
- KEYED DRAWING NOTE

ABBREVIATIONS
(STANDARD ABBREVIATIONS, ALL ABBREVIATIONS MAY NOT APPEAR ON THE DRAWINGS)

A	AMPERE
ADA	AMERICANS WITH DISABILITIES ACT
AF	FUSE RATING IN AMPS
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AL	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
AT	TRIP RATING IN AMPS
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CU	COPPER
D	EXISTING TO BE DEMOLISHED
DISC. SW.	DISCONNECT SWITCH
DIV.	DIVISION
DWG	DRAWING
E, EX	EXISTING TO REMAIN
EM	DEVICE ON EMERGENCY CIRCUIT
EMT	ELECTRICAL METALLIC TUBING
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FASP	FIRE ALARM SMOKE PURGE PANEL
FATC	FIRE ALARM TERMINAL CABINET
FLA	FULL LOAD AMPS
FSS	FUSIBLE SAFETY SWITCH
G	GROUND
GFI	GROUND FAULT INTERRUPTER
GRS	GALVANIZED RESISTIVE CONDUIT
HP	HORSE POWER
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HWH	HOT WATER HEATER
HZ	HERTZ
IBC	INTERNATIONAL BUILDING CODE
IG	ISOLATED GROUND
IECC	INTERNATIONAL ENERGY CONSERVATION CODE
IESNA	ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA
KCMIL	THOUSANDS OF CIRCULAR MILS
KVA	KILOVOLT-AMPS
KW	KILOWATT
LM	LUMEN
LTG	LIGHTING
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
N	NEW
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFSS	NON FUSED SAFETY SWITCH
NL	NIGHT LIGHT FIXTURE
NTS	NOT TO SCALE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P	POLE
PH, Ø	PHASE
PNL	PANEL
R	RELOCATED AT NEW LOCATION
REC	RECEPTACLE
RR	REMOVE AND RELOCATE
S/N	SOLID NEUTRAL
SPD	SURGE PROTECTIVE DEVICE
SWBD	SWITCHBOARD
T, XFMR	TRANSFORMER
TYP.	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WP	WEATHERPROOF

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P: 703-691-2115
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NO.	DATE	BY	DESCRIPTION
3	05-12-2023	XX	ADDENDUM 1
2	12-15-2022	XX	ISSUE FOR BID
1	10-26-2022	XX	100% CONSTRUCTION DOCUMENTS FOR REVIEW

REVISIONS

SETTY	USDA
PROJECT MANAGER: MK	EPM
DESIGNER: RK	PPM
CHECKED BY: IH	SAFETY & HEALTH
DRAWN BY: RK	REAL PROPERTY
	SOLICITATION NO.
	DATE

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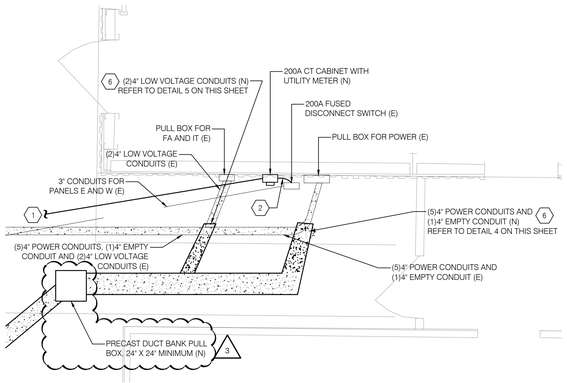
GENERAL NOTES, SYMBOLS & ABBREVIATIONS

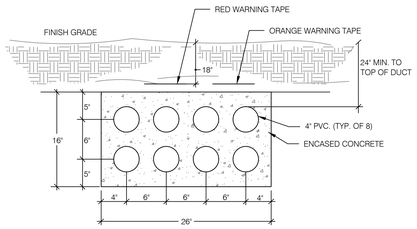
DWG. NO. **E001**

SHEET 08 OF 11



2 ES101 BUILDING 54 CONDUIT ROUTING

SCALE: 1/32" = 1'-0"



3 ES101 4" - 8WAY (2Hx4V) 6 POWER AND 2 LOW VOLTAGE CONDUIT DUCT BANK DETAIL

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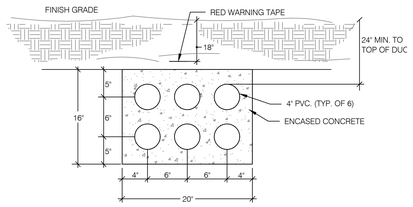
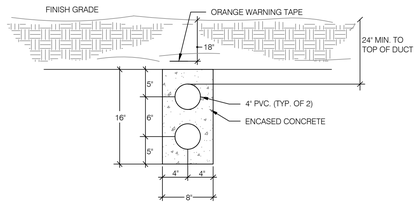


4 ES101 4" - 6WAY (2Hx3V) POWER CONDUIT DUCT BANK DETAIL

SCALE: NOT TO SCALE



5 ES101 4" - 2WAY (2Hx1V) LOW VOLTAGE CONDUIT DUCT BANK DETAIL

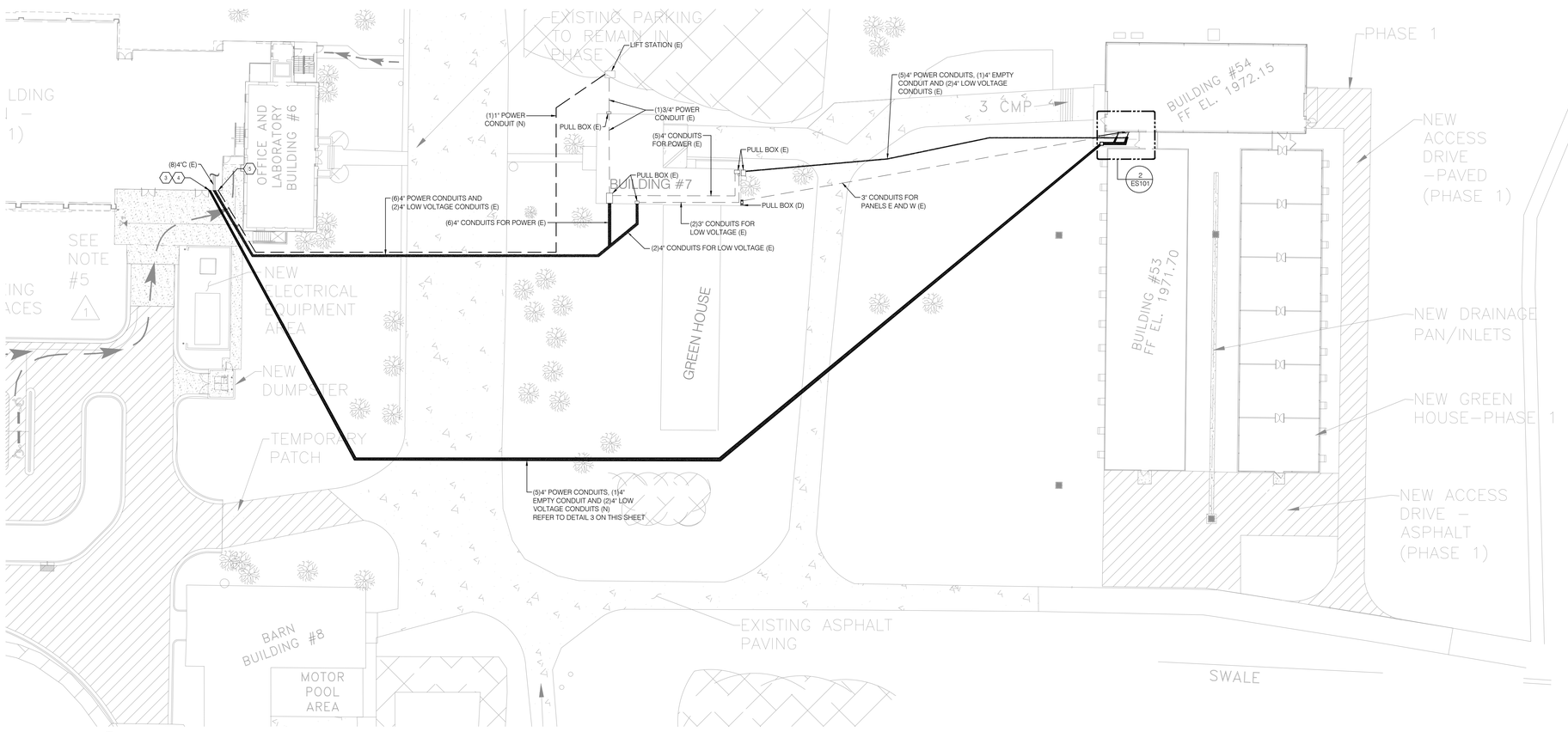
SCALE: NOT TO SCALE

GENERAL NOTES

1. REFER TO DRAWING E001 FOR ELECTRICAL GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. COORDINATE WITH CIVIL AND LANDSCAPE PLANS FOR EXACT LOCATION, DETAILS AND ADDITIONAL INFORMATION, PRIOR TO ROUGH-IN WORK.
3. UTILIZE HAND DIGGING WHERE WORK IS REQUIRED IN THE VICINITY OF KNOWN UNDERGROUND UTILITIES. TAKE ALL NECESSARY PRE-CAUTIONS SO NO EXISTING UTILITIES GET ACCIDENTALLY DAMAGED.
4. FIELD COORDINATE THE EXACT LOCATION OF UNDERGROUND CONDUITS WITH ALL OTHER UNDERGROUND UTILITIES AND THE SITE CONDITIONS.
5. FIELD COORDINATE ALL UNDERGROUND CONDUITS AND DUCT BANK LOCATION/ROUTING WITH THE SITE CONDITIONS AS WELL AS STRUCTURAL FOOTINGS, AND ONLY AFTER APPROVAL BY STRUCTURAL AND CIVIL ENGINEERS.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO ALL CONCRETE & STRUCTURE. EXISTING DAMAGES WILL BE MARKED ON A PRE-CONSTRUCTION WALK THROUGH.
7. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT. VERIFY FIELD CONDITIONS AND COORDINATE WITH EXISTING CONDITION.
8. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, INCLUDING REQUIREMENTS OF LOCAL AUTHORITIES.
9. ASPHALT PAVEMENT, CONCRETE, FENCES, VEGETATION, GRASS AND GRAVEL AREAS WHICH HAVE BEEN DISTURBED SHALL BE RESTORED AND REPAINTED TO MATCH EXISTING.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS AND SCHEDULING ALL INSPECTION. ALL FINAL INSPECTIONS SHALL BE COMPLETED BEFORE ACCEPTANCE BY THE OWNER.
11. WHERE UNDERGROUND WIRING CROSSES EXISTING SIDEWALK OR ROADWAY, BORE/MISSILE BELOW WITHOUT DISTURBING OR DAMAGING SURFACE ABOVE. PROVIDE SCHEDULE 40 PVC SLEEVE IN BORED HOLE FOR CONDUIT TO ROUTE THROUGH.

SHEET KEY NOTES

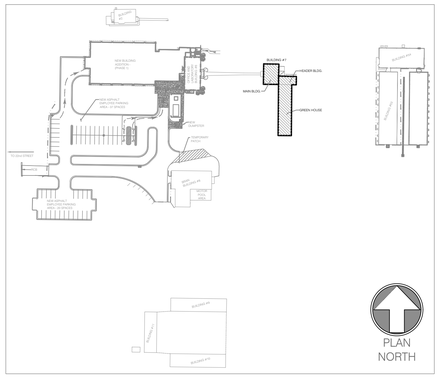
1. PROPOSED 200A, 208/120V, 3 PHASE UTILITY SERVICE. COORDINATE WITH UTILITY COMPANY FOR EXACT ROUTING AND ADDITIONAL INFORMATION.
2. PROVIDE NEW CONDUIT (4 #3/0AWG + 1 #6 AWG G IN 2" C) TO EXISTING DISCONNECT SWITCH.
3. ROUTE (5) 4" CONDUITS FOR POWER CONDUCTORS INTO PULL BOX OR PULLING ELBOWS ON EXTERIOR WALL AT 8'-0" AFG. REFER TO DETAIL 3 ON SHEET ES102 FOR MORE INFORMATION.
4. ROUTE (2) 4" CONDUITS FOR LOW VOLTAGE CABLING INTO PULL BOX OR PULLING ELBOWS ON EXTERIOR WALL AT 8'-0" AFG. REFER TO DETAIL 3 ON SHEET ES102 FOR MORE INFORMATION.
5. ROUTE 3/4" CONDUIT FOR POWER CONDUCTORS INTO PULL BOX OR PULLING ELBOW ON EXTERIOR WALL AT 8'-0" AFG. REFER TO DETAIL 3 ON SHEET ES102 FOR MORE INFORMATION.
6. ROUTE NEW CONDUITS IN PREPARATION FOR EXTENDING CONDUITS TO EXISTING PULL BOXES.



1 ES101 ELECTRICAL SITE PLAN - PHASE 1

SCALE: 1/32" = 1'-0"

KEYPLAN



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P. 703-691-3311
FAX 703-691-3319
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NO.	DATE	BY	DESCRIPTION
3	05-12-2023	xx	ADDENDUM 1
2	12-15-2022	xx	ISSUE FOR BID
1	10-26-2022	xx	100% CONSTRUCTION DOCUMENTS FOR REVIEW

REVISIONS

SETTY	USDA
PROJECT MANAGER: MK	EPM
DESIGNER: RK	PPM
CHECKED BY: IH	SAFETY & HEALTH
DRAWN BY: RK	REAL PROPERTY

SOLICITATION NO.

DATE

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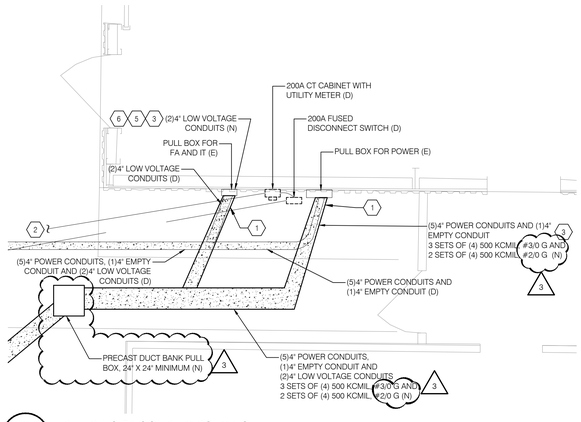
ELECTRICAL SITE PLAN - PHASE 1

DWG. NO **ES101**

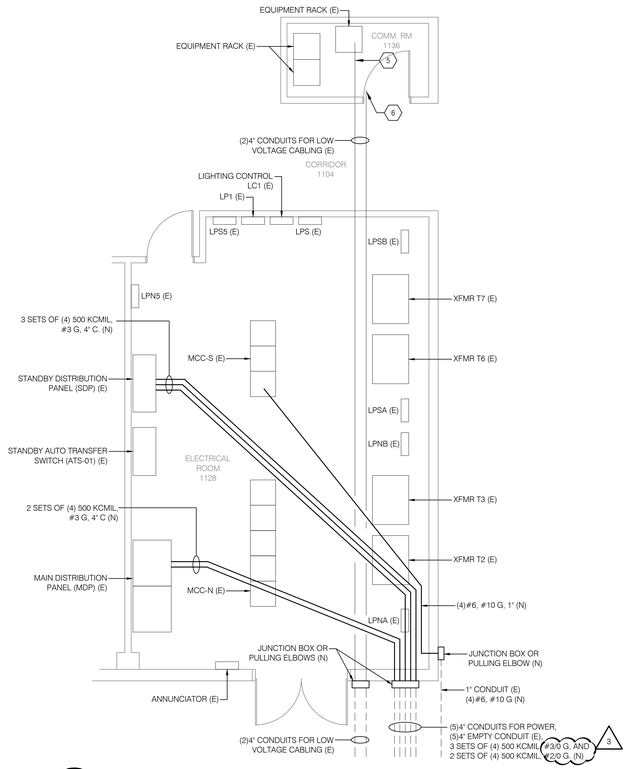
SHEET 09 OF 11

Original drawing size is 30"x42"; Scale entities accordingly if reduced/enlarged.



2 ES102 BUILDING 54 CONDUIT ROUTING

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



3 ES102 BUILDING 6 MAIN ELECTRICAL AND COMMUNICATION ROOM LAYOUT

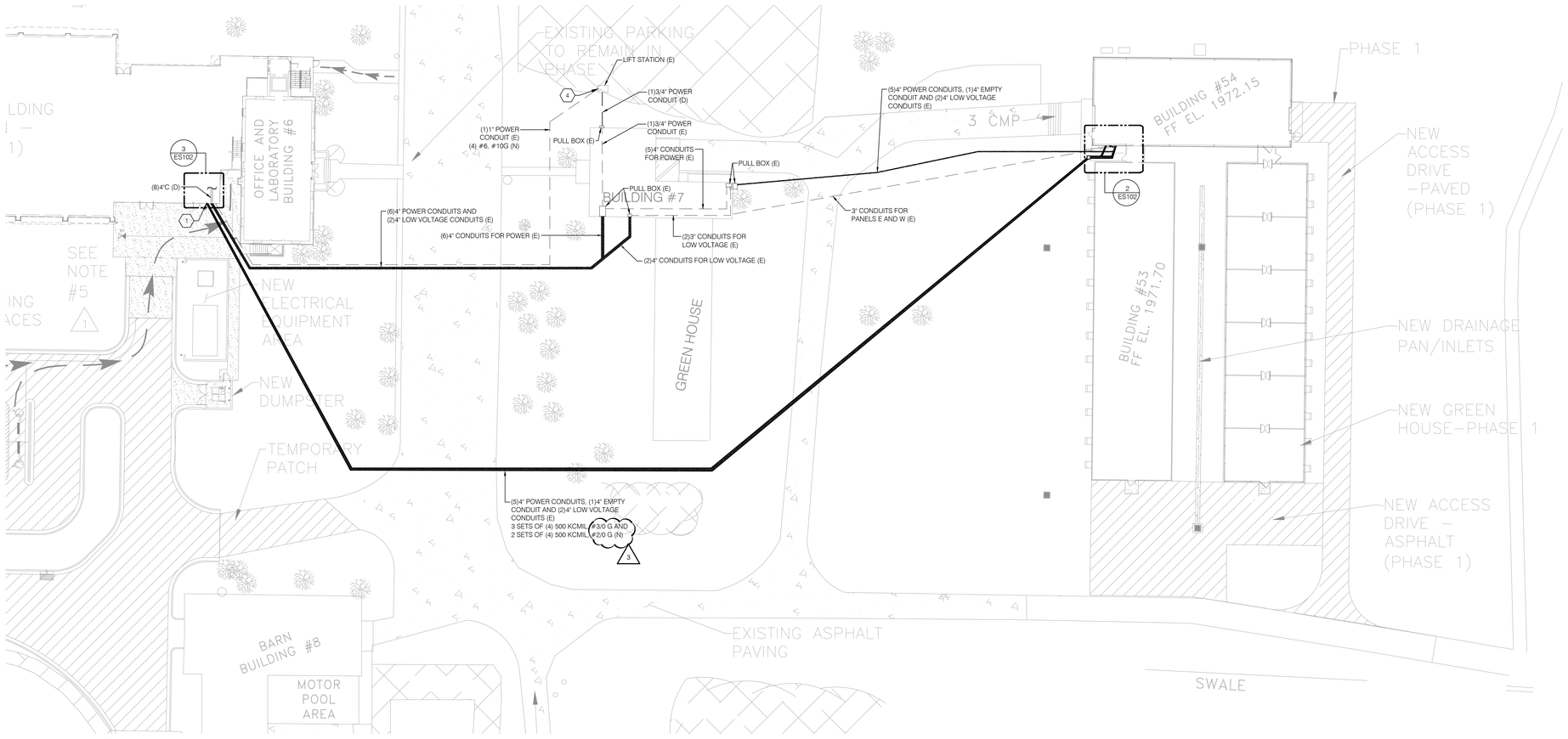
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. COORDINATE WITH OWNER PRIOR TO DISCONNECTING PREVIOUS FEEDERS. ALL POSSIBLE PREPARATION WORK FOR NEW FEEDERS MUST BE COMPLETE PRIOR TO DISCONNECTING PREVIOUS FEEDERS TO MINIMIZE DOWNTIME.
2. REFER TO DRAWING E001 FOR ELECTRICAL GENERAL NOTES, LEGEND AND ABBREVATIONS.
3. COORDINATE WITH CIVIL AND LANDSCAPE PLANS FOR EXACT LOCATION, DETAILS AND ADDITIONAL INFORMATION, PRIOR TO ROUGH-IN WORK.
4. UTILIZE HAND DIGGING WHERE WORK IS REQUIRED IN THE VICINITY OF KNOWN UNDERGROUND UTILITIES. TAKE ALL NECESSARY PRE-CAUTIONS SO NO EXISTING UTILITIES GET ACCIDENTALLY DAMAGED.
5. FIELD COORDINATE THE EXACT LOCATION OF UNDERGROUND CONDUITS WITH ALL OTHER UNDERGROUND UTILITIES AND THE SITE CONDITIONS.
6. FIELD COORDINATE ALL UNDERGROUND CONDUITS AND DUCT BANK LOCATION/ROUTING WITH THE SITE CONDITIONS AS WELL AS STRUCTURAL FOOTINGS, AND ONLY AFTER APPROVAL BY STRUCTURAL AND CIVIL ENGINEERS.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO ALL CONCRETE & STRUCTURE. EXISTING DAMAGES WILL BE MARKED ON A PRE-CONSTRUCTION WALK THROUGH.
8. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT, VERIFY FIELD CONDITIONS AND COORDINATE WITH EXISTING CONDITION.
9. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, INCLUDING REQUIREMENTS OF LOCAL AUTHORITIES.
10. ASPHALT PAVEMENT, CONCRETE, FENCES, VEGETATION, GRASS AND GRAVEL AREAS WHICH HAVE BEEN DISTURBED SHALL BE RESTORED AND REPAINTED TO MATCH EXISTING.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS AND SCHEDULING ALL INSPECTION. ALL FINAL INSPECTIONS SHALL BE COMPLETED BEFORE ACCEPTANCE BY THE OWNER.
12. WHERE UNDERGROUND WIRING CROSSES EXISTING SIDEWALK OR ROADWAY, BORE/MISSILE BELOW WITHOUT DISTURBING OR DAMAGING SURFACE ABOVE. PROVIDE SCHEDULE 40 PVC SLEEVE IN BORED HOLE FOR CONDUIT TO ROUTE THROUGH.

SHEET KEY NOTES

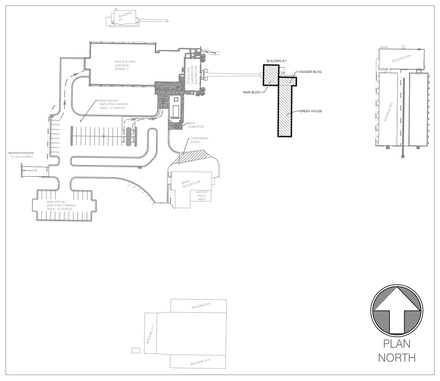
1. CONTRACTOR TO RECONNECT THE EXISTING FEEDERS AS PREVIOUSLY SERVING THIS BUILDING.
2. EXISTING 200A, 208/120V, 3 PHASE UTILITY SERVICE TO BE REMOVED.
3. EXTEND CONDUITS TO EXISTING PULL BOX ONCE PREVIOUS CONDUITS HAVE BEEN REMOVED. COMPLETE WORK IN A MANNER TO MINIMIZE DOWNTIME.
4. CONNECT NEW CONDUCTORS TO LIFT STATION CONTROL PANEL ONCE EXISTING CONDUCTORS ARE REMOVED. COMPLETE WORK IN A MANNER TO MINIMIZE DOWNTIME AND COORDINATE ANY OUTAGE WITH OWNER.
5. ROUTE MULTIMODAL FIBER OPTIC CABLE THROUGH LOW VOLTAGE CONDUIT. CABLE SPECIFIED BY OWNER.
6. ROUTE FIRE ALARM CABLE THROUGH LOW VOLTAGE CONDUIT. CABLE SPECIFICATION TO MATCH FIRE ALARM CABLE IN EXISTING DUCT BANK.



1 ES102 ELECTRICAL SITE PLAN - PHASE 2

SCALE: 1/32" = 1'-0"

KEYPLAN



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P: 703-691-2115
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NO.	DATE	BY	DESCRIPTION
3	05-12-2023	xx	ADDENDUM 1
2	12-15-2022	xx	ISSUE FOR BID
1	10-26-2022	xx	100% CONSTRUCTION DOCUMENTS FOR REVIEW

REVISIONS

SETTY	USDA
PROJECT MANAGER: MK	CPM
DESIGNER: RK	PPM
CHECKED BY: IH	SAFETY & HEALTH
DRAWN BY: RK	REAL PROPERTY

USDA Agricultural Research Service

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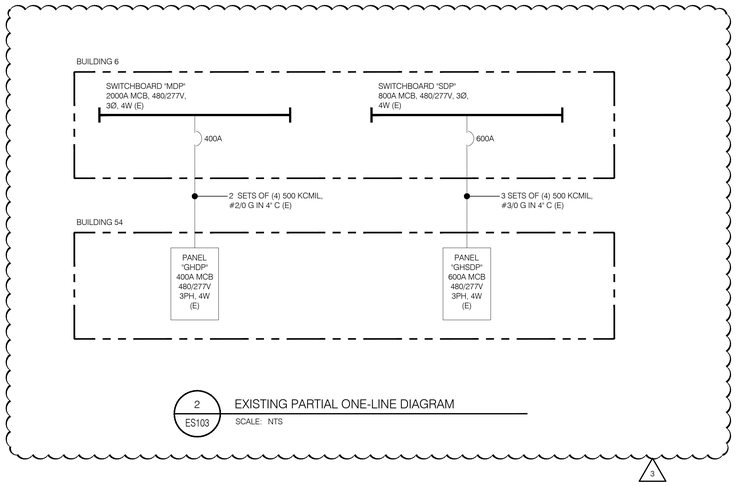
ELECTRICAL SITE PLAN - PHASE 2

DWG. NO **ES102**

SHEET 10 OF 11

Original drawing size is 30"x42"; Scale entities accordingly if reduced/enlarged.



2 ES103 EXISTING PARTIAL ONE-LINE DIAGRAM

SCALE: NTS

GENERAL NOTES

1. COORDINATE WITH OWNER PRIOR TO DISCONNECTING PREVIOUS FEEDERS. ALL POSSIBLE PREPARATION WORK FOR NEW FEEDERS MUST BE COMPLETE PRIOR TO DISCONNECTING PREVIOUS FEEDERS TO MINIMIZE DOWNTIME.
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3. COORDINATE WITH CIVIL AND LANDSCAPE PLANS FOR EXACT LOCATION, DETAILS AND ADDITIONAL INFORMATION, PRIOR TO ROUGH-IN WORK.
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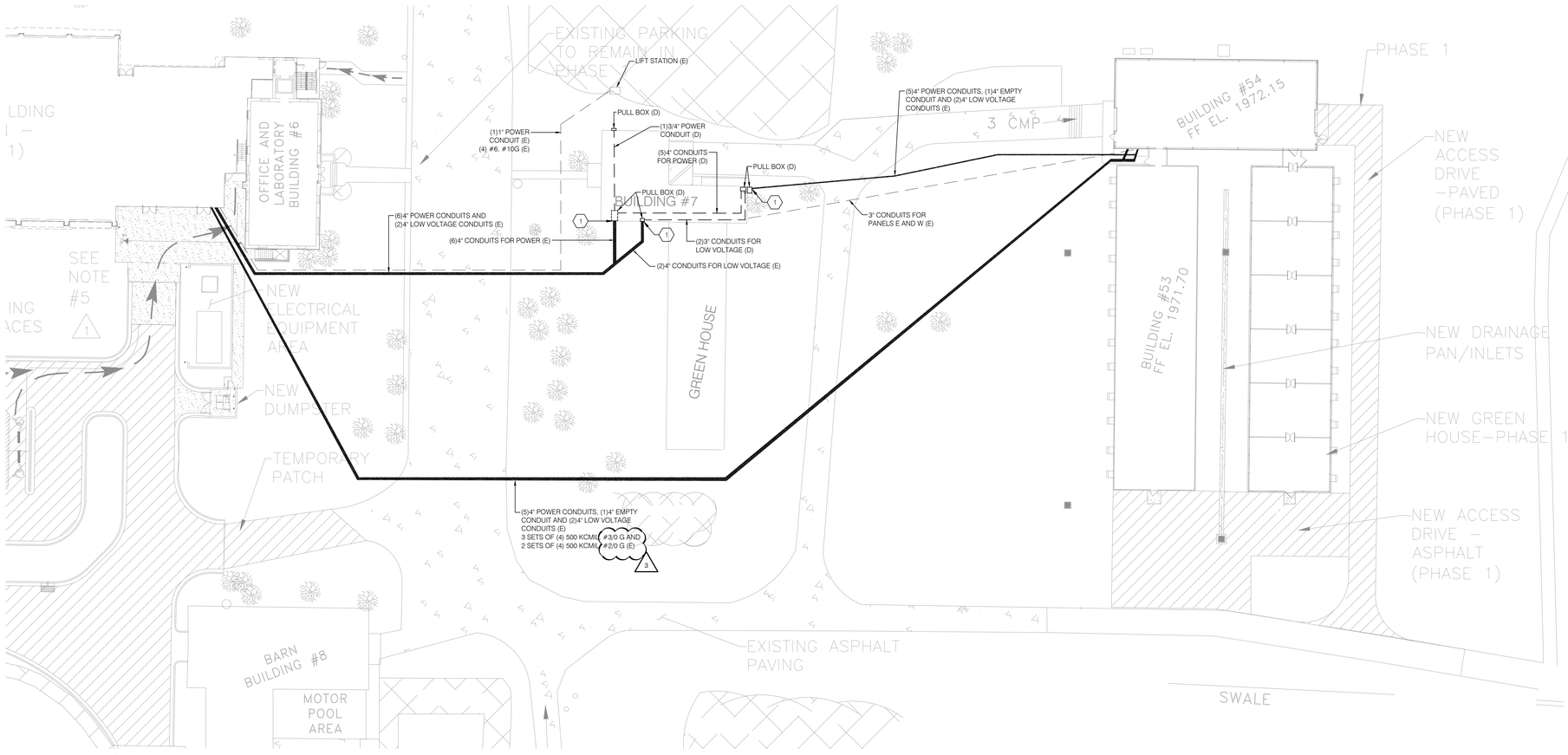
13. UNDERGROUND CONDUIT SHOWN AS REMOVED MAY REMAIN ABANDONED UNDERGROUND IF APPROVED BY OWNER.

SHEET KEY NOTES

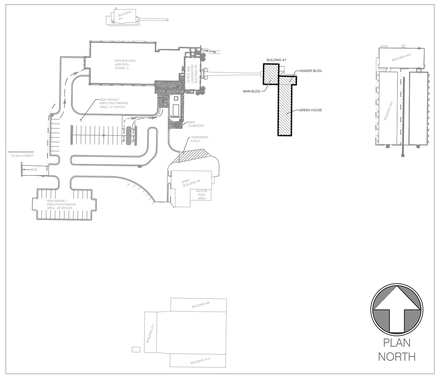
1. CUT AND ABANDON DUCT BANK AT EXCAVATION LIMIT FOR BUILDING 7 DEMOLITION.



1 ES103 ELECTRICAL SITE PLAN - PHASE 3 AND ONE-LINE DIAGRAM

SCALE: 1/32" = 1'-0"

KEYPLAN



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REVISIONS

SETTY	USDA
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CHECKED BY: IH	SAFETY & HEALTH
DRAWN BY: RK	REAL PROPERTY

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3

ELECTRICAL SITE PLAN - PHASE 3 AND ONE-LINE DIAGRAM

DWG. NO **ES103**

SHEET 11 OF 11

Original drawing size is 30"x42"; Scale entities accordingly if reduced/enlarged.